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Predicting rumination from the five facets of mindfulness

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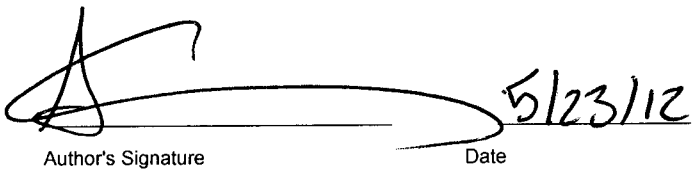

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Predicting Rumination from the Five Facets of Mindfulness

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Allen Creamean

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Abstract

Mindfulness is defined as a process of paying attention to the moment-by-moment experience of thoughts and feelings. It is a non-elaborative, non-judgmental, present-centered awareness in which each thought, feeling or sensation that arises in the attentional field is acknowledged and accepted (Kabat-Zinn, 1990; 1998). The concept of mindfulness adopted in Western therapeutic contexts was derived from Eastern spiritual and philosophical Buddhist teachings. Since its introduction nearly 20 years ago, mindfulness-based treatments have evolved towards altering the relationship between the self and internal/external sensations to reduce multiple forms of psychological and physical morbidity (Bishop et al., 2004). Currently, it is used as a mechanism to prevent relapse of depression (Segal, Williams, & Teasdale, 2002; Scherer-Dickson, 2004), anxiety (Roemer & Orsillo, 2002), eating disorders (Telech, Agras, Stewart, & Linehan, 2001), and a variety of other psychological disorders (see Kabat-Zinn, 1990 for review). Much of the literature have provided empirical support for the effectiveness of these treatments but have not explored the roles that the five facets of mindfulness play in predicting or reducing the minute features of mental illness. The purpose of the current study was to replicate results supporting the effectiveness of mindfulness in reducing rumination while examining the specific facets of mindfulness that facilitate this change. In addition, rumination was tested as a possible mediator to ascertain the nature of mindfulness' influence on the states of depression and anger. Two forms of rumination were examined: depressive and anger rumination. They are distinct forms of the same maladaptive coping mechanism (Whitmer & Banich, 2007). One hundred thirty-two Eastern Illinois University students participated in the study. Their levels of mindfulness,

depressive/anger rumination, and depressive/anger states were measured. Overall, mindfulness exhibited inverse relationships with both depressive and anger rumination. The mindfulness facet of 'non-judgment' primarily accounted for the lower levels of depressive and anger rumination. In addition, the facets of 'non-reactivity' and 'observation' were associated with anger rumination (though 'observation' was unexpectedly positively correlated with anger rumination). Subsequent analyses examining the relationship between mindfulness and depressive/anger emotional states found depressive rumination to be a partial mediator of the relationship of mindfulness with depression, while anger rumination fully mediated the relationship with anger. Clinical implications of this research, limitations and suggestions for future studies were discussed.

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Introduction

Rumination is an important area of study in clinical psychology because of the role it plays in perpetuating and maintaining psychopathology. The application of mindfulness-based therapies holds promise in yielding decreases in rumination. The purpose of the current study was to explore the relationship between trait mindfulness and rumination. Specifically, it investigated: 1) if mindfulness is associated with reduced levels of two types of rumination: depressive and anger rumination; 2) which of the five facets of mindfulness are most predictive of depressive and anger rumination; 3) whether the inverse relationship of mindfulness with depression is mediated by lower levels of depressive rumination; and 4) whether the inverse relationship of mindfulness with anger is mediated by lower levels of anger rumination. Results of this study can help researchers and therapists understand which specific facets of mindfulness are predictive of rumination. Given that these facets can be construed as a set of skills that can be developed, the study can identify which mindfulness skill researchers can test and therapists can target in reducing rumination and enhancing well-being.

What is Mindfulness?

Mindfulness is defined as a process of paying attention to the moment-by-moment experience of thoughts, feelings, and sensations (Kabat-Zinn, 1990). In this process, attention is non-judgmental in that whatever occurs is simply observed by the individual without any biased interpretation. Being aware of the context is difficult in a fast paced society, and may lead many to overlook the subtleties of every day life. Take for example eating; when we eat to satiate our hunger, we neglect the minute features of the food we are consuming. When one eats mindfully, the food is consumed using all senses. For

example, a raisin is held within the hand so one can feel all of the ridges of the fruit (Bennett-Goleman, 2001). The consistency is felt as one squeezes the fruit between their fingers. The odor of the raisin is noticed as one brings it to their nostrils and smells the aroma. The raisin is placed in their mouth, in which they feel the fruit move around on the tongue, noticing not only the sensation of touch, but the sense of taste. They may hear themselves chewing the fruit as they then notice the sensations of swallowing. This process of eating utilizes all sensations without judging any particular aspect of the stimulus. Using all senses in the present moment delineates what it is to be mindful.

The concept of mindfulness was derived from Eastern spiritual and philosophical Buddhist teachings. Now mindfulness has migrated towards into many Western behavior therapies that have included mindfulness techniques in practice. Western orientations are now adopting mindfulness techniques to alter the relationship of the self to thought which has been demonstrated to reduce psychological morbidities (Kabat-Zinn, 1990), have salutary effects on well-being for clients (Shapiro, Oman, Thoresen, Plante, & Flinders, 2008; Brown & Cordon, 2009), and have prevented depressive relapse (Segal, Williams, & Teasdale, 2002; Scherer-Dickson, 2004).

Antithesis of Mindfulness: Mindlessness

Mindfulness contrasts with mindlessness; a minimal mode of information processing that typically involves rigid, inflexible thought processes on both cognitive and emotional levels (Langer, 1989). In mindlessness, information is processed at a subconscious level, not readily available for conscious consideration. General cognitive processing typically uses a minimal amount of information for small tasks. However when a task is novel, more information is typically needed. The same can be said for

novel circumstances; when the context is unfamiliar there is much more information needed to adequately assimilate to the environment. For example, an assembly line worker will conduct the same action hundreds if not thousands of times per day. To first learn how to put together the object, the individual needs to be trained about every aspect of the object. That is, understand what the object is and how to put it together; mindfully process the object. From that point on the worker will process each object less and less until the object can be assembled mindlessly. If the worker were to approach each new assembly mindfully, productivity would suffer. Moreover, a task is that typically conducted habitually with few negative consequences (e.g., walking) is transformed into a mindful act by thinking about the specifics, will likely result in a slowing of the process.

Although the description of mindlessness holds negative connotations within the context of mindfulness, it may be beneficial in situations that require some sort of efficiency. The length of process required with mindfulness does not always yield better performance when working on a familiar issue (Langer & Weinman, 1981; Lewicki, 2005). Mindlessness may better be understood as automatic-controlled processing; a form of processing in which information is already understood and interpreted within a given context. Mindlessness should not be considered under the umbrella of laziness, but rather as a means of achieving efficiency.

Despite the benefits of mindlessness, many flaws arise due to the minimal amount of cognitive processing. The habitual approach to processing mindless activities makes it difficult for the individual to describe specific details about what occurred. It is easy to become lost in thought because much of the mind is not devoted to the task at hand.

Losing sight of the context will often lead to greater amounts of cognitive failures (Herndon, 2007) and may lead to deficits in judgment (Langer, 1989). Mindlessness may lead one to form a rigid relationship upon first encounter of information. These same schemas may be further bolstered without any corroboration as the connection between stimulus and interpretation is circulated throughout the thought process (Lewicki, 2005). Many people dread visits to the DMV because it is chaotic and the staff are far from friendly. Any time those staff are seen out of the DMV they are still interpreted as unfriendly. Because we conceive their friendliness mindlessly, we leave out the contexts in which they themselves are not subjected to nine hours of chaos every day. From that point on they are labeled as unfriendly, not given the chance to redeem themselves.

Universal Conceptualization of Mindfulness

Though mindfulness has been conceptualized in various ways in the literature, these conceptualizations generally converge along three primary processes: present moment awareness, attention, and acceptance. These constructs are among the most commonly cited in mindfulness literature to describe the actions that encapsulate mindfulness. Awareness is defined by Deikman (1996) as a continuous monitoring of inner events and the means by which humans observe. These internal events can be observed through an awareness of feelings, emotions, and thoughts. A client with depression may exemplify awareness by identifying what emotions they are currently having along with what has triggered the emotions. A recent fight with a spouse may have triggered an emotion of being sad. However, the feeling of sadness may have extended beyond the original provocation. Present moment awareness is the component of mindfulness that inhibits the ability to reflect on unwanted memories or emotions of

the past or future. Being mindful will allow the individual to assimilate the current context, thereby alleviating the sadness associated with the initial provocation.

The second universal component of mindfulness is attention. Attention is often depicted as a heightened sensitivity to a limited range of experience (Kosslyn & Rosenberg, 2001). That is, small or delicate features appear salient that would otherwise be overlooked. Attention is hindered when one enters a habitual mode of interacting with the environment, taking most of what they see for granted. For example, a driver engages cruise control and turns on the music when driving down a commonly used interstate. The driver may lack attention to the road because he feels that he has driven down the road enough to know it well. Because he was lacking attention to details, he may not notice the herd of deer in the field to his right. In this scenario, he did not expect a deer to be crossing the interstate (as this is not a common event). Because of his negligence to detail, he ends up hitting a deer. When the environment is taken for granted, the minute details that could make a large difference in how we engage with the environment are neglected and may result in dire consequences.

The third commonly emphasized quality is that of acceptance. Hayes (1994) defines acceptance as "experiencing events fully and without defense, as they are" (p. 30). In other words, acceptance is a nonjudgmental attitude of acceptance or compassion towards the present moment experience. It is important to note that acceptance does not mean passivity or resignation, but rather accepting the current state as logical given the current context. There is no need to berate the self by thinking "I should be happy" when the current context is not conducive to happiness. These "should statements" (Beck, 1995) only serve to exacerbate unhappiness. To illustrate acceptance, refer to the

previous example in which one feels sadness after a recent argument. Subsequent to the altercation, the feeling of sadness is sustained despite the provocation being absent. The feeling of sadness may continue because of a cycle of thoughts questioning "what did I do to deserve this" or "why am I still feeling like this?" These thoughts can be drastically reduced by breaking this cycle of thought.

Twelve Qualities of Mindfulness

Jon Kabat-Zinn, a leading researcher in mindfulness literature and originator of Mindfulness-based Stress Reduction (MBSR) conceptualizes mindfulness as a non-elaborative, non-judgmental, present-centered awareness in which each thought, feeling or sensation that arises in the attentional field is acknowledged and accepted (Kabat-Zinn, 1990; 1998). This conceptualization is further specified in terms of twelve mindful qualities that outline the construct (Shapiro & Schwartz, 2000). The first is that of non-judgment defined as "an impartial witnessing, observing the present moment-by-moment without evaluation and categorization" (p. 263). One may exhibit non-judgment by not applying any sort of schematic bias (interpretations of the event that are based on previous analogous contexts). The second quality of mindfulness is that of non-striving. Non-striving is "to be non-goal oriented, remaining unattached to outcome or achievement, not forcing things" (p. 263) that often occurs through a cessation of desires that sustain pleasant experience. Non-striving is similar to the quality of letting-go, which is defined as "non-attachment, not holding onto thoughts, feelings, experiences" (p. 263). Non-striving contrasts with the quality of letting-go in that the latter is a form of detaching from current pleasant experience whereas non-striving refers to a detachment of past experience. One may experience pleasant feelings through mindfulness

meditation, but it is suggested not to strive to achieve that feeling once again, because every new experience produces new sensations, thereby negating the ability to replicate the sensations verbatim.

Patience, the fifth quality is defined as allowing things to unfold in their time, bringing patience to ourselves, to others, and to the present moment. Patience is pertinent to acceptance, allowing events to unravel on their own terms, as we have little influence over the timeframe of external events.

Trust, the sixth feature is a faith in oneself, one's body, intuition, emotions, as well as trusting that life is unfolding as it is supposed to. Trust allows one to be patient, as we understand that what unfolds is a process that we cannot control and that our reactions are natural given the context. Without trust one may believe that their reactions are irrational, causing greater distress over being "abnormal." Most human reactions are normal given the context; our perception of our reaction often exacerbates the reaction however, to states that often become pathological.

The seventh quality of mindfulness is that of openness, which is defined as "seeing things as if for the first time, creating possibility by paying attention to all feedback in the present moment" (p. 263). Openness is often cited in social psychological literature as a component that enhances creativity and learning, by allowing for a variety of interpretations for one event (Langer, 1997). Openness is reflective of the 'beginner's mind' (Bishop et al., 2004), in which one experiences the environment as a novice, even if the context is familiar to the individual.

The final five components of mindfulness (Shapiro & Schwartz, 2000) emphasize compassionate qualities towards the self. The first is of gentleness, which is characterized

by a soft, considerate and tender quality; however, not passive, undisciplined or indulgent. In order to be gentle with oneself there must be empathy, which is a quality of feeling and understanding the self or another person's situation in the present moment—his or her perspectives, emotions, actions (reactions)—and communicating this to the self or other. To understand that these struggles are an organic reaction to aversive states, one must be empathetic with the self to not further aggravate the reaction. Likewise, understanding that mistakes are inevitable will reduce the probability of reacting towards others negatively, thereby reducing the distress of both the self and others.

The third of the compassionate qualities is that of generosity. Generosity is "giving into the present moment within a context of love and compassion, without attachment to gain or thought of return" (p. 263). In this sense, one may enjoy any and every moment because there is no desirable context, making the individual appreciative of the context regardless of what is present. When one is generous, they also exhibit gratitude, the fourth quality of compassionate mindfulness. Gratitude is "the quality of reverence, appreciating and being thankful for the present moment" (p. 263). Gratitude is crucial to well-being, as it negates the habitual form of thinking that typically takes familiar contexts for granted. An individual who has experienced a traumatic event may benefit from these qualities; generosity may allow the individual to express love and gratitude for being in the present moment, thus reducing stress associated with the past. Overall, these qualities will reduce tension and increase appreciation for being in the current moment.

The final quality of mindfulness is that of loving kindness. Loving kindness is the "quality of embodying benevolence, compassion and cherishing, a quality filled with

forgiveness and unconditional love" (p. 263). It allows one to understand that flaws are inevitable, and that when a fault occurs, that it is a natural process of being human. With loving kindness, one can release any sort of harsh criticism of the self from past events because no matter the circumstances, one has unconditional love for the self and others. It allows for a genuine empathetic nature that is free of bias from previous events. In terms of the 'beginner's mind' (Bishop et al., 2004) we no longer filter bias through our beliefs, and naturally present a loving nature regardless of past flaws. In order to be genuinely happy with the self, we must appreciate happiness in others (Ricard, 2010), essentially describing what Freud (1937) coined as the altruistic defense mechanism. This compassionate stance towards the self and others will ultimately reduce the harsh criticisms that may recur in the thought cycle from previous faults.

The twelve components of mindfulness are consistently referred to in mindfulness interventions as affective qualities of mindfulness. These qualities attempt to define mindfulness conceptually, but fail to offer an empirical account of mindfulness. Without quantifiable terms for components such as loving-kindness or generosity, it is difficult for researchers to come to common conclusions about the benefits of mindfulness.

Operationalizing Mindfulness

Bishop and colleagues (2004) were among the first researchers to focus primarily on arriving at measurable qualities of mindfulness. After a series of meetings that were held to establish a consensus of mindfulness by leading researchers in the field, a two-component model of mindfulness was constructed. The authors identify mindfulness as 1) the self regulation of attention in addition to 2) an open, curious, and accepting orientation to experience. This conclusion was derived from various components of

mindfulness, including specific behaviors, experiential manifestations, and implicated psychological processes, all of which can be quantifiably measured. Identifying mindfulness under these terms allows researchers today to expand on the mindfulness literature as well as to develop and conduct efficacy studies of behavior treatments that incorporate mindfulness.

The two-component model identifies five measurable qualities of mindfulness: 'observing,' 'describing,' 'acting with awareness,' 'non-judgment,' and 'non-reactivity.' Baer and colleagues (2006) obtained these five facets through a factor analysis of items from previous measures of mindfulness. These instruments included the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), the Cognitive and Affective Mindfulness Scale (CAMS-R; Feldman, Hayes, Kumar, & Greeson, 2007), the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Freiburg Mindfulness Inventory (FMI; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006) and the Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005). After administering the combined items to participants, five distinct facets were extracted. Each facet individually refers to various methods of maintaining and regulating attention in a mindful manner.

The first facet of 'observing' refers to any sort of attention with regards to the self; more specifically, "observing, noticing, attending to sensations, perceptions, thoughts, and feelings" (p. 34; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). 'Observing' includes the attention to stimuli, both internally and externally. By maintaining an objective stance towards stimuli (e.g., thoughts, feelings emotions), one can distance the self in order to not become engulfed within thought (e.g., belief a

thought reflects reality). Fixating on thoughts as true beliefs will distort reality based on one's schematic view of the self. If the self schema is negative, then experiences will be perceived as negative. Noticing an experience *as an* experience allows one to let the event pass by in awareness which reduces bias in interpretation (Teasdale et al., 2002).

The second facet taps into the ability to describe. To 'describe' is to be able to label internal sensations (i.e., emotions, thoughts, and feelings) loquaciously (Baer et al., 2006). If one is feeling sad, then the sensations that typically arise with sadness should allow the individual to indicate that she is feeling sad. By labeling the physical sensations that coincide with an emotion (i.e., tightening in chest, drowsiness) there is a better understanding of what that emotion is. This facet may target alexthymia, a personality trait that inhibits the ability to identify feelings (Haviland, Warren, & Riggs, 2000). Although describing is considered one of the five facets of mindfulness, it was not found to have predictive validity of psychological symptoms (Baer et al., 2006). This trait may be unnecessary in reducing psychological symptoms; however the overall engagement with other mindfulness variables establishes the construct as a core facet.

The third facet of 'acting with awareness' is a core feature of mindfulness, and describes the ability to maintain a constant stream of attention to the present moment, and concentrate without any sort of distraction (Baer et al., 2006). 'Acting with awareness' is synonymous with Kabat-Zinn's (1990) definition of awareness, in that both require sustained attention of what is currently happening in the environment. When one is fully aware, they may notice stimuli that they previously overlooked during a habitual mode of mind. Being fully aware of the present moment allows for the most accurate interpretation of the current context

The fourth facet, 'non-judgment,' refers to the level of judgment one has with regards to their experience and the sensations derived from that moment. To be non-judgmental, one must cease all evaluation of one's inner experiences (cognitions and emotions). This again is synonymous with Kabat-Zinn's (1990) interpretation of non-judgment.

The final facet of 'non-reactivity' concerns the extent to which an individual can pull back from an inner experience and simply view without habitually acting upon it. 'Non-reactivity' connotes the 'being mode of mind' (Segal et al., 2002), where every sensation is experienced rather than reacted to. Approaching the environment in the being mode allows one to understand how the environment functions without any influence from the self. Without taking any action no personal bias is introduced into the environment one can accept the present moment. The student who has failed his first exam may try to reason with the teacher to improve his grade. He may have immediately acted (doing mode) based on what he has known to work in the past (e.g., reasoning with his mother to get his way). When he ultimately fails at that, he feels even worse that he has failed twice. If he avoids reacting based on his previous schemas without considering the context (the teacher is not equivalent to mom), he can locate solutions that are appropriate given the context.

After developing the FFMQ, Baer and colleagues (2006) examined the relationship between these qualities and well-being. Results of their study suggest a link to the alleviation of pathological symptoms through practice of the qualities. The authors indicate that educating and practicing these facets can ultimately be an aid in reducing many symptoms brought into therapy. These qualities are continuously emphasized in

mindfulness-based therapies, and have yielded positive outcomes in reducing psychological distress (Bishop et al., 2004).

Variations in Defining Mindfulness

Mindfulness has been largely studied in the contexts of social and clinical psychology. The core cognitive process emphasized in social psychological literature involves the external environment in that mindfulness consists of an awareness of the external surroundings, attention to what is happening in those external surroundings, and an unconditional acceptance of those events. The acceptance component of mindfulness in social literature does not stress 'non-judgment' found in Kabat-Zinn's (1990) conceptualization of mindfulness (Cardiacitto, 2005). That is, one can accept the environment, but may still have personal biases that are associated with the stimuli as long as it does not hinder the attention and awareness of external stimuli. Mindfulness allows one to see all contexts as novel regardless of the familiarity. It thus allows for creativity by enhancing the possibilities in a given context. Because we are naturally attracted to novelty (Langer, 1997), recreating each situation as new sustains attention, which allows for greater absorption of the material. Social psychological literature considers actions to first occur in a being mode of mind, followed by a doing mode. By first approaching the context with full attention and awareness one can reduce the cognitive failures associated with mindlessness (Herndon, 2007).

Clinical psychology utilizes mindfulness to bring awareness to internal features of the self, rather than the external environment. The purpose of mindfulness in clinical psychology is to alleviate suffering by understanding the relationship of external context with internal reactions. An awareness of one's reaction to an event allows the individual

to understand that their reaction is logical. Many times suffering is prolonged by self-judgments (e.g., "why do I still feel this way"). By accepting the emotion as a rational response to a negative experience, one can be empathetic towards the self to speed the healing process. By rejecting the emotion with self-judgments the healing process is extended. Self judgments occur because the individual does not consider the circumstances of the event. In cognitive-behavioral therapy, a commonly used technique is to project a similar predicament towards a friend to allow for objective interpretation of the event (Beck, 1995). This technique is similar to a mode of being, where the individual distances themselves from the bias of thought and interprets the context as they would if they were observing it happening to a friend. By considering all variables in the context, the individual can enter the doing mode, where they react by considering all variables. Troubles arise when the doing mode is the first method of approaching a problem. In these cases, one immediately reacts based on what has worked in similar contexts in the past or by what they think is best. Solutions may be biased by surpassing the being mode because one does not consider the context. For example, a dysphoric individual feels hopeless about meeting new people because they weren't asked to go out with some people they met from class. They feel there is no reason why they should make an effort to meet others because "Nobody likes me anyway, what's the point of going out?" This solution has been comprised within a negative bias; the decision to stay in was fueled by a "what's the point?" attitude. If that same individual entered a being mode by stepping back from the emotion and observing the context in a non-biased light, they may have been able to consider "well, I just met them" and "I guess I didn't make any effort to call either." They can then locate situations to resolve the issue such as making a call

themselves or consider alternatives that beneficial to the self but do not rely on the actions of this group of friends (e.g., exercising). Once a sound solution is chosen, then the individual can enter the doing mode and act upon the solution. This process limits the ability for negative bias to take hold of one's actions and thus reduces the possibility of acting in ways that worsens psychopathology.

Clinical Applications of Mindfulness

In recent years, behavior therapy has been modified to adapt to changing interpretations of behavior tendencies. Behavior therapies have evolved in three waves, the first being traditional behavior therapy; a form of therapy based on learning theory that utilizes techniques designed to reinforce or eliminate undesired behaviors (Hayes, 2004). Stemming out of traditional behavior therapy was cognitive behavioral therapy (CBT), developed by Aaron T. Beck in the 1960s. CBT addressed the cognitions that were absent from traditional behavior therapies under the assumption that dysfunctional automatic thoughts hold strong influence to various psychological disorders. In cognitive-behavioral interventions the mode of alleviating stress involves an evaluation and reflection of dysfunctional thought processes (Beck, 1995). This method is shown to be efficacious with a variety of populations; the client may learn to rearrange thoughts in order to transform behaviors, which in turn will lead to better outcomes for the client.

More recently, a third wave of behavior therapies evolved from CBT that does not attempt to correct maladaptive thoughts, but accept them as part of a personal private experience. It is not the goal to eliminate the thoughts; rather the purpose of third wave behavior strategies is to alter the functions thoughts have so that the effect is less severe on the psychology of the individual. To alter this function, the third wave therapies utilize

mindfulness, an acceptance of the present moment and release of defensive ego mechanisms to experience life in the "here and now." With mindfulness, the goal is not to transform reality to fit the individual's personality, but rather embrace a non-judgmental awareness of the present moment (Kabat-Zinn, 1990). In this light, the intention is not to avoid problems but to accept the reaction to the problem as natural which in turn will lead to less rumination regarding the response.

These third wave behavior therapies include Dialectical Behavior Therapy (DBT) (Linehan 1993), Acceptance and Commitment Therapy (ACT) (Hayes, Strosahl, & Wilson, 1999), Mindfulness Based Stress Reduction (MBSR) (Kabat-Zinn, 1990), and Mindfulness Based Cognitive Therapy (MBCT) (Segal et al., 2002). These models utilize several components of mindfulness that are linked to decreases in multiple forms of psychological and physical morbidity (Bishop et al., 2004).

Dialectical Behavior Therapy (DBT). Dialectical behavior therapy was developed by Marsha Linehan (1993) to treat the severe reactions of clients with Borderline Personality Disorder. DBT uses several strategies to target these maladaptive behaviors such as behavioral activation to monitor and modify behavior that aid in sustaining proper coping strategies. Social skills are also taught to reduce conflict in interpersonal relationships that first bring about the stress. Emotion regulation is also taught in DBT often using relaxation techniques (e.g., mindful breathing) to cope with stress.

In DBT, mindfulness is utilized to change the interaction with thoughts, rather than the content. Borderline patients often fuse with dysfunctional thought regardless of evidence supporting the thought. In DBT the fusion with the thought is broken through the realization that thoughts distinct entities from the self. This understanding allows the

client to accept thoughts as not true reality, reducing the influence the thought typically has on behaviors.

DBT is an effective method of altering the relationship to thoughts. Because BPD clients are often engulfed in biased thought, the methods of defusion can be seen as a primary strength in this intervention. The defusion process is not specific to any one thought but to all thoughts, making it generalizable to a wide variety of situations for the client. DBT targets all areas of interpersonal functioning in the client's social domain. If a client is criticized by a spouse, they cannot control the content of the criticism, but they can control the way they identify with the criticism which in turn controls how they react. Each technique is implemented to create a sense of control over the self that is not dependent on others actions which, due to the influence relationship conflicts have on BPD clients, can be seen as the primary strength of treatment.

The strengths of DBT however can also be seen as limitations when applied to other treatment populations. Mindfulness procedures require that a client has the intention and willpower to accept the content of thoughts. The client may not have the strength to accept thoughts for what they are; in which case altering the content of thoughts may be a better option. Defusion is an abstract concept that requires great cognitive strength and devotion. The process is difficult to grasp when therapy is traditionally approached with the medical model mindset. The mindset of changing the relationship rather than finding a solution can be seen as a limitation in a society that has been exposed to a medical model that traditionally aims to simply "fix" the problem. DBT is a growing therapy used in several settings, and is currently expanding to be used with Binge Eating Disorder and Bulimia Nervosa (Chen, Matthews, Allen, Kuo, Linehan, 2007)

Acceptance and Commitment Therapy (ACT). Acceptance and commitment therapy is a burgeoning as a third wave treatment that includes many components of mindfulness to alter the fusing of thoughts with the self. Developed by Steven Hayes (1999; 2002), ACT functions under the premise that human beings learn to derive and combine stimulus relations and bring them under arbitrary contextual control. One may first accrue anxiety in a social environment such as a bar. This anxiety may then be generalized to different aspects of their life, such as work or school, and then may become more specific to affect their home life. This mutual or combinational entailment causes avoidance of situations that may provoke anxiety. If the anxiety is bolstered in several contexts by combining ambiguous situations with the anxiety associated with the initial provocation, then the individual may develop a generalized social anxiety disorder.

ACT works by taking thoughts that are close to the client and breaking the relation and interacting with thoughts as if they are physical matter. Once thoughts are disengaged as perceived qualities from the individual's self concept, the function of the thought no longer has the influence it previously had. Hayes (1999) coined this process as *cognitive defusion*: the act of looking at thoughts rather than looking from thoughts. Defusion acts as a tool to break the fixation one has on thoughts by interpreting them as separate from one's identity. When thoughts are fused with our identity, thoughts have strong influence over how we perceive ourselves. However, if one breaks the fusion with thoughts, then there is less influence and thus less conflict in the identity of the individual, leading to greater levels of self-worth and well being.

Defusion occurs by externalizing thoughts rather than internalizing. A variety of techniques are utilized in order to achieve the externalization of thoughts. For example,

each time a client refers to a problem by stating "you" instead of "I", they are attempting to create a situational barrier which is easier to make excuses for rather than putting the blame on the self (Hayes, 2007). Another technique is the weakening of stimuli in which an aversive stimulus is repeated over and over until the meaning of the word is lost. Hayes provides an example with the word "milk". While repeating the word several times over, it loses meaning, and we lose the association we have with the word milk with the actual product. The same process is often repeated with dysfunctional thoughts such as "I'm a failure" where the client will repeat this statement over several times until meaning is lost. This technique allows the client to break associations that may be sustaining their pathology. Several other techniques are applied in ACT which allow the client to defuse from their thoughts, which is often considered to be one of the primary benefits of mindfulness (Shapiro et al., 2008).

Mindfulness Based Stress Reduction (MBSR) and Mindfulness Based Cognitive Therapy (MBCT). Mindfulness is particularly emphasized in MBSR and MBCT strategies as the mechanism that creates cognitive defusion that breaks the influence of negative perceptions. MBSR was one of the first mindfulness based techniques originated by Jon Kabat-Zinn (1990) to help manage the debilitating strains of chronic pain. More recent research on MBSR yielded positive outcomes for emotional and behavioral disorders (Reibel, Greeson, Brainard, & Rosenzweig, 2001; Speca, Carlson, Goodey, & Angen, 2000; Carlson, Ursuliak, Goodey, Angen, & Speca, 2001) and deterioration of stress and increased psychological well being (Astin, 1997; Shapiro, Schwartz, & Bonner, 1998; Williams, Kolar, Reger, & Pearson, 2001). The premise for reducing stress falls under the notion that "anxiety relies on mindlessness. It may be mindful to notice

that a stimulus is potentially threatening, however, the anxiety-provoking stimulus is potentially simultaneously many things, which is why it does not lead everyone to feel anxious" (Langer, 1989; p. 156). MBSR has been shown to yield decreases in levels of pain from a variety of physiological pathologies (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, & Burney, 1985). Heightened levels of pain occur due to the attention given to the area that is in pain. If one can distance the self from the pain and interpret it objectively, it is more likely the pain will reduce to a manageable level (Kanfer & Goldfoot, 1966). MBSR takes this notion and alters it, attempting to reinterpret stimulus, which Langer and colleagues (1975) suggest can reduce psychological distress (Langer, Janis, & Wolfer, 1975).

MBCT utilizes several of the same mindful concepts as MBSR but integrates cognitive-behavioral techniques to help target the distorted thoughts. This form of therapy is primarily used as prevention for relapse of depression and has been extensively supported to be effective with patients who have continuously relapsed three or more times (Teasdale et al., 2000). Shapiro and colleagues (2008) reported significant reductions in rumination (one of the primary mechanisms sustaining depression) in subjects undergoing treatment with MBCT.

Both forms of therapy utilize mindfulness as a mechanism for experiencing rather than attempting to control. Whereas other forms of therapy such as CBT or traditional behavior therapy attempt to take control of the maladaptive response or cognitive pattern, mindfulness based treatments strive for a non-judgmental acceptance of the environment, essentially altering the relationship with any provocative stimuli. Once the interpretation of the stimulus changes, we can release the thoughts from our identity through a process

of cognitive defusion (Hayes, Masuda, Bisset, Luoma, & Guerrero, 2004). Once thoughts can be accepted as separate from the self, then mindfulness procedures can be implemented to teach clients to look at the present moment with acceptance, which later in turn will lead to greater well being.

Applying Mindfulness in Therapeutic Settings

Mindfulness-based interventions utilize many of the same concepts used to achieve the present moment awareness of the first three stages. The goal of treatment is not to follow the path of insight to the end, but to experience reality and detach from maladaptive thought patterns that we identify with.

Body scan. Body scanning is a technique utilized in mindfulness based interventions (both MBCT and MBSR) to engage in concentration of the bodily sensations. The therapist will spend 30-40 minutes lying down with his clients, and directing the attention throughout the body starting from the left foot, up the leg, to the chest, and back down towards the right foot. The goal is to focus on the present moment sensations clients are currently experiencing. Difficulties with concentration often occur when first beginning meditation, as racing thoughts may consistently distract from the focus of the body scan. Although erratic thoughts may take hold of the individual, it is important to understand that that is a natural human function, and we should embrace it just as we would focusing on any body part during the scan. If possible, it is encouraged to try to bring attention back on to the breath or current area of focus. It is emphasized in the body scan that there is no wrong way to engage in this meditative practice; Kabat-Zinn (2007) states that as long as you are breathing, you are doing more right than wrong as meditation is a time for *being*, rather than *doing*. In the being mode, we simply observe

what occurs and if we are distracted by thought, then that is an event that occurs. When one tries to alter the interpretation of event through rumination, they revert to the doing mode, which is discouraged in meditation. During the body scan, it is important to maintain a sense of continuity between attention from various areas of the body. If thought does interfere, then the focus remains on the thought until attention can be brought back on the breath. The primary objective of the body scan is to observe the various areas of the body that are usually overlooked as parts that make up our physical self.

Mindful breathing. The first stage of active concentration is often achieved through the breathing task (Segal et al., 2002). This task is utilized in both MBSR and MBCT forms of therapy and is often used as a tool for maintaining attention on the self in other forms of meditation. A typical breathing exercise is as follows:

1. Assume a comfortable posture lying on your back or sitting. If you are sitting, keep the spine straight and let your shoulders drop.
2. Close your eyes if it feels comfortable.
3. Bring your attention to your belly, feeling it rise or expand gently on the inbreath and fall or recede on the outbreath.
4. Keep the focus on your breathing, "being with" each inbreath for its full duration and with each outbreath for its full duration, as if you were riding the waves of your own breathing.
5. Every time you notice that your mind has wandered off the breath, notice what it was that took you away and gently bring your attention back to your belly and the feeling of the breath coming in and out.
6. If your mind wanders away from the breath a thousand times, then your "job" is simply to bring it back to the breath every time, no matter what it becomes preoccupied with.
7. Practice this exercise for fifteen minutes at a convenient time every day, whether you feel like it or not, for one week and see how it feels to incorporate a

> disciplined meditation practice into your life. Be aware of how it feels to spend some time each day just being with your breath without having to *do* anything.
>
> Adapted from Kabat-Zinn, J. (1990). *Full Catastrophe Living*. New York: Bantam Dell

When the hold that thought takes over our actions becomes uncontrollable, we lose touch with our identity. As Hayes and Smith (2005) describe, "we are driving a bus and all of our thoughts are passengers. One may come up to the front and give us directions to turn left when we really want to continue down this street. The thought bothers you so much that you finally decide to give in and make the left turn." This task allows one to listen to what the self truly wants, thus reducing the influence the thought has over our actions. This exercise heightens one's distress tolerance by suggesting an alternate coping mechanism in which the destructive tendencies of rumination are not possible if done on a continual basis. It also teaches that based on the lack of emotion in this process, how much our thoughts influence our emotions. If we can avoid the dysfunctional thought process and focus on only relevant subjects (i.e., sensations in a body examining exercise), then emotion will not be as influenced by past or future events. The author notes that there is no wrong way to do this exercise; the only way one can do this exercise wrong is by not breathing. Even if thoughts distract one from the breath, it is a natural human function, and should not be judged critically. Over time, bringing the attention back on the breath will allow for heightened focus on the breath. Although there is no proper way to perform the exercise, practice will allow for greater attention of the self, which is the ultimate goal of the exercise.

Mindful eating. The raisin exercise is another mindful technique utilized strongly in mindfulness based interventions. During this task, clients take a raisin, and observe its characteristics through all of the senses. The client feels the raisin with their hand,

squeezes it to feel the density and firmness. The next step is to put it up to the nose to detect the smell of the raisin. The next step is to hold it up to the ear to listen to any possible noise one may hear from holding a raisin that close to the ear. Next, the raisin is run across the lips for some time until placed on the tip of the tongue. As the taste buds are activated, the raisin makes its way to the back of the tongue towards the teeth that will chew it. Once the individual begins to chew the raisin, attention is paid to the change in texture and flavor as it is masticated. Finally, the raisin is swallowed and the attention is focused on its journey to the bottom of the stomach. This long and tedious process of eating teaches the client two important characteristics of mindfulness: first, during this process attention is constantly in tune to the qualities of the raisin. There is no opportunity for bias because all sensations determine the context of the fruit at that given moment. Additionally, the act of mindfully eating the fruit opens new perspectives of the fruit that is usually taken for granted in the habitual doing mode of mind. The implications with present moment awareness in the habitual doing mode is that people typically do not take the breaks needed to observe everything that they do in their day. The purpose of eating is typically to refuel, in which case we do not take notice of what exactly we are eating or take the time to savor the food; eating becomes habitual and mindless. Habituation is a process of seeing the stimulus as familiar (Langer, 1989) in which case we take them for granted and no longer appreciate the value of the object. If a stimulus is mindfully processed on each presentation, habituation may not occur and thus each moment is appreciated as if it were new.

Other Mindfulness Techniques

Mindfulness can be cultivated in a variety of ways. Most are included in mindfulness based treatment plans in order to fully experience mindful awareness. Other variations include mindful yoga, walking meditation, hand meditation, and many others (for elaboration see Kabat-Zinn, 1990; Segal et al., 2002; Williams, Teasdale, Segal, & Kabat-Zinn, 2007). Most exercises can be conducted in a variety of contexts (i.e., walking to work, sitting in any chair) as long as there is limited distraction from the environment around. These can be conducted standing, sitting, or laying on the ground or padded surface. These techniques can vary in times from focusing on one single breath to 45 minute exercises. The malleability of mindfulness techniques allows any individual to utilize mindfulness in a variety of contexts, which often makes the exercises enticing for those who are constantly on the go.

How is Mindfulness Beneficial?

The cultivation of mindfulness has several salutary effects on the brain, body, and mind (Bishop et al., 2004). Much of mindfulness literature focuses on the benefits of mindful attention in terms of psychological well being (Kabat-Zinn, 1990; Shapiro et al., 2008). Mindfulness also transforms several aspects of one's life to maximize well being including the brain, immune system, attention, creativity, and problem solving.

The brain. Davidson (2003) elaborated upon Kabat-Zinn's (1990) findings on the physiological benefits through several neurophysiological research designs. It was found that experienced meditators showed increased left-sided anterior activation compared to control groups who developed a change in the opposite direction. Meditation increases the level of plasticity in brain development, which has been associated with positive

affect (Davidson, 2003). Lazar and colleagues (2005) reported long-term meditation practice to be associated with altered resting electroencephalogram patterns, which is indicative of long lasting changes in brain activity. The analysis also yielded results supporting the hypothesis that meditation can provoke changes in the brain structure. Prefrontal cortical thickness was primarily found in older participants, which Lazar and colleagues (2005) suggest to be a residual effect of meditation; that is, meditation reduces the rate of cortical thinning. The thickness of the two brain regions was significantly correlated with meditation experience which provides evidence for experience-dependent cortical plasticity in association with meditation. The plasticity found in seasoned meditators has significant implications for psychological well being, as it increases the level of psychological mindedness in those who practice.

Attention. Mindfulness is largely associated with attention, specifically to the present moment. The act of engaging in mindful meditation requires the utilization of attention which through practice only serves to enhance attentional qualities in settings outside of meditation. Jha, Krompinger, and Baime (2007) ascertained the levels of attention in post treatment mindfulness based stress reduction (MBSR; Kabat-Zinn, 1990) participants. Participants in MBSR courses gained significantly greater levels of orientation in comparison to the control participants. Additionally, those participants who went on a one month mindfulness retreat demonstrated increased conflict monitoring. The current study has several implications for mindfulness training. First, mindfulness training may improve attention by specifically enhancing subcomponents of attention rather than attention as a global construct. Second, those who were enrolled in the MBSR course were found to have increased intrinsic attention, focusing on the endogenous

features of the self (thoughts, bodily sensations). Those who received the month treatment developed receptive attentional skills, which were deemed pertinent to the external alerting-related process (Jha et al., 2007).

Attention is the part of mindfulness that exposes one to novelty by cultivating the "beginner's mind" (Bishop et al., 2004) and making the trivial become salient as novel stimuli. Langer (1998) explains the depreciation for novelty in terms of inattention which can be linked to the doing mode of habitual behaviors; when in the doing mode, one habitually interacts with then environment and may miss out on the joys of simple things. One may perceive things as not enjoyable due to an inability to pinpoint distinct characteristics of the stimulus. In order to deem a stimulus more enjoyable, it is essential to point out novel distinctions in the stimulus. For example, a painting may look like a bunch of smudges with the paintbrush, but when the strokes are carefully examined, the attention to detail may be able to create a new, more appreciative perception of the painting for how the details make a greater whole.

Creativity. Ellen Langer posits that the present moment awareness that is synonymous with seeing the context as novel allows for an expansion of creativity. In her earlier work (1989) she incorporated mindful techniques to organically alter the attentional problems of children with attention deficit/hyperactivity disorder. The problem with ADHD is that the individual's attention is too easily pulled away by novel stimuli (i.e., looking outside a window rather than working on schoolwork). The reason for the deficit is that these individuals are learning under the same circumstances at all times. The intervention strategy emphasized a change in the circumstances in which the child learned material. Children with ADHD were given directions to memorize a picture

in one of two groups: an experimental group where the picture was moving (novel circumstances) and a control where the picture remained in one position (control). The novel circumstance retains the focus of the children with ADHD, which was not the case with the control group. Given the heightened attention to novelty found in those who are mindful (Langer, 1989), it can be used to alleviate symptoms of inattention which can serve as a method to help children with ADHD function without the use of stimulants.

Problem solving. Mindfulness is also said to benefit problem solving strategies. Langer (1998) states that when we act in a habitual manner (doing mode), the context of the circumstances is neglected. When coming to a conclusion, all evidence should be considered, which includes the environment. If for example, a mother has been distant toward her son, which has contributed to some tension between them, one should not assume she is a poor mother. She may be working, having to take care of other children, the father may not be present; all evidence needs to be considered before solutions can be implemented based on fact. Mindfulness helps one see that there is not one right answer, but several, depending on the context. For example, although triangles always measure to 180 degrees, there is variation in how that triangle can be composed. When we are mindful, we realize that every inadequate answer is adequate in some other context.

Defining Rumination

Merriam-Webster's Medical Dictionary defines rumination as an "obsessive or abnormal reflection upon an idea or deliberation over a choice." In the context of psychology, it is a method of coping with negative mood that involves self-focused attention (Lyubomirsky & Nolen-Hoeksema, 1993). Rumination, however, is often considered to be a maladaptive coping style (Carver & Scheier, 1981; Pysczynski &

Greenberg, 1987) as it often involves a cycle of repetitive and unwanted thoughts, a major symptom of a number of mental disorders. It initiates and maintains prolonged periods of chronic unhappiness (McIntosh & Martin, 1992), depression (Nolen-Hoeksema, 1987; Pysczsynski & Greenberg, 1987) and inhibits the ability to rationally problem solve (Carver, Scheier, & Weintraub, 1989). Because the act of ruminating cycles unwanted thought processes, it is counterproductive in almost all instances, and can occur (in a controlled or in a habitual manner) in extended periods of time (Martin & Tesser, 1989). Take for example an instance of a newly admitted college student struggling to adjust with his courses:

> During high school Jon maintained a high grade point average but is now having difficulties in his course work. He has always believed he was intelligent, but cannot understand why he failed his first quiz in college calculus. He began to ponder on why this was occurring, trying to resolve the discrepancy between his perception of himself as intelligent and his poor performance. He first sought help from the professor, but his teacher felt he could not allot enough time to address the dilemma. Jon became more distressed after hours of studying, still confused on the subject. Finally he sought the help of a tutor, but the tutor was unable to simplify the material in terms Jon felt he could understand. With the next exam in two weeks, Jon has yet to understand the new material. Every occasion he

> would open his textbook the problems appeared more difficult, even impossible. He found that his study habits were no longer going to help, so eventually he gave up, asking himself "what's the use?" He would consistently reflect back on his first failure and begin to become depressed about his inadequacy as a student. He consistently cycled the thoughts around in his mind until he believed that his potential in college was limited. Jon neglected to study for his first exam because he continued to think there was no point. He was not surprised when he found out he failed in this exam, too.

Jon's self image took a drastic change during this time. He began with the belief that he was an intelligent, hard-working student. One instance of failure triggered a negative thought. It may have not influenced him greatly at first, but with more difficulty in solving his math problems, he came to the conclusion that his new self-concept appeared to be valid. With more practice on difficult problems, his negative thought cycle was triggered more often. This process is what constitutes rumination; it is a cycle of unwanted and recurring thoughts. Jon continued to berate his worth by referencing his past failure. Instead of breaking that cycle and finding new ways to approach studying, he maintained the same thought format which triggered the same schemas. The thoughts continued so frequently that his self-worth regressed to believing that he was incapable of handling college work, leaving him feeling helpless.

Rumination and Depression

Rumination is significantly related with depression (See Nolen-Hoeksema, Wisco, Lyubomirsky, 2008 for review). Early studies have indicated that it is predictive of the duration and number of depressive episodes (Nolen-Hoeksema, 1991). However, subsequent studies on the predictive qualities of rumination have refuted these findings. These latter findings indicate that rumination is predictive of onset but not duration. Rumination scores did not predict a continuation of depressive episodes in those who were previously diagnosed. Instead rumination predicted new onsets of major depressive episodes of individuals who were not diagnosed with major depression a year prior (Nolen-Hoeksema, 2000). Bagby, Rector, Bacchiochi, and McBride (2004) suggest that the act of ruminating is static in nature; the extent to which one ruminates during a depressive episode does not increase nor decrease, regardless of whatever variables exacerbate depression. Rumination increases before the onset of a depressive episode but once the threshold is reached, the level of rumination remains constant.

In an empirical investigation of rumination, Nolen-Hoeksema and Morrow (1993) induced rumination with neutrally valenced prompts that let the participants focus on thoughts and feelings (e.g., "think about the level of motivation you feel right now"). Respondents were asked to rate how often they engage in each of the ruminative thoughts or behaviors when they are feeling sad, depressed, or blue (Nolen-Hoeksema et al., 2008). It was hypothesized that nondysphoric individuals would not be affected by the prompts. Dysphoric participants (characterized with greater negative feelings and cognitions) however, would yield a progression of dysphoria throughout the process. In another condition, participants were subjected to a distraction that was irrelevant to the self (e.g., "Think about the layout of your local shopping center"). The distraction was

expected to have no effect on nondysphoric individuals, but to decrease the level of short term depressive symptoms in dysphoric people. The rumination induction yielded greater levels of depression in dysphoric individuals while the nondysphoric remained the same. The distraction induction was shown to be effective in reducing dysphoria in dysphoric participants.

Lavender and Watkins (2004) conducted research that showed an increased negative thinking pattern in those who ruminate. Using the rumination induction paradigm (Nolen-Hoeksema & Morrow, 1993), it was found that dysphoric participants retrieve more negative memories about the past and present, and tended to anticipate more negative outcomes about the future. Lyubomirsky and colleagues (1999) found that the ruminative prompts resulted in more pessimistic interpretations when solving problems. Although a negative thinking pattern is present in dysphoric participants, Lyubomirsky and Nolen-Hoeksema (1993) reported that they were just as likely as nondysphoric individuals to recognize pleasant distractions as a means of alleviating their distress. The motivation to partake in those distractions however was limited and thus not utilized as a method of alleviating their depression. It is clear that the negative thinking pattern that circulates through the ruminator's mind has a strong influence on depressive symptoms. It is important to note that rumination is distinct from depression in that negative thinking patterns are not synonymous with the disorder. It is the negative thinking cycle in rumination that enhances vulnerability to depressive disorders.

Dimensions of Rumination

Rumination can be characterized along two dimensions: valence and motivation (Whitmer & Banich, 2007). Valence can either have a positive, negative, or neutral

valence. A positive valence would be indicative of positive features (e.g., joy). On the other hand, negative valence reflects negative features (e.g., sadness, anger). Negative valence is illustrated in the example of Jon who tends to berate himself over their first failed exam. Because of the lack of neutrality, Jon cannot reflect objectively upon his performance. If the thought process was positively valenced, he would have a better outlook on upcoming tests, and have less anxiety about failing.

Motivation can be one of approach or avoidance. When one approaches a conflict, one actively engages in problem solving to locate a solution. Avoidance in contrast occurs in many maladaptive forms of rumination where the individual attempts to locate a solution in a passive manner. Avoidance is an acute response of fleeing the negative feelings that conflict brings upon the individual (Cannon, 1915). When one is encountered with a displeasing situation, the natural tendency is to find a way to avoid or flee the environment and to seek refuge in a more desirable state. For example, instead of finding alternative ways of studying, Jon kept criticizing himself for failing. He consistently repeated over in his mind that he was not smart enough for school, which in essence passively solved the conflicting ideals of his intelligence clashing with his failures. Avoidance in this case may temporarily ease stress; however the negative thought pattern only serves to lower his self esteem. Because he is fixated on these negative interpretations of his intelligence, the likelihood of working towards bettering his course grade is sparse. To break his thought cycle, new thoughts need to be introduced in order to distract from the destructive cyclical nature of rumination.

Types of Rumination

Depressive rumination. The most common form of rumination cited in the research literature is depressive rumination. Nolen-Hoeksema & Morrow (1991) describes depressive rumination as recurrent thought focused on the causes, symptoms, and implications of one's depression. Rumination is negatively valenced; it is more often associated with negative interpretations rather than positive ones. The motivation behind depressive rumination is avoidance, particularly behavioral inhibition (Leen-Feldner, Zvolensky, Felner, & Lejuez, 2004). Those who are prone to ruminative tendencies tend to avoid the negative emotions associated with the conflict and thus avoid engaging in problem solving behaviors.

Treynor and colleagues (2003) delineate depressive rumination in terms of two components that comprise the construct: brooding and reflection. Brooding, as defined by *Webster's New Collegiate Dictionary* is a state of "moody pondering; to think anxiously or gloomily about." Brooding is primarily bolstered by "a low sense of mastery—that is, to a passive contemplation of what's wrong in your life and how you wish it was better" (Treynor, Gonzalez, & Nolen-Hoeksema, 2003; p. 257). It is important to note that brooding is not necessarily self-criticism as it can also include thoughts such as "why do I deserve this"? Statements like these do not necessarily encapsulate a form of self criticism, but more of a quandary regarding a negative event. Criticism stems from the failure to achieve a particular goal. When the goal is unattainable, then in essence control is lost over the situation.

Brooding can be easily bolstered with little evidence. As soon as the individual develops a schema of their own identity (or for any event that results in brooding), they

engage in a self-perpetuating cycle (Lewicki, 2005) that only serves to exacerbate the vulnerability to depression (Treynor et al., 2003). Brooding in the current study is measured by the brooding sub-scale of Ruminative Response Scale (RRS; Treynor et al., 2003). The RRS is a 10 item scale that ascertains the level of rumination based on thoughts or behaviors that reflect feeling sad, blue or depressed. Items on brooding subscale include "Think 'What am I doing to deserve this?" and Think "Why do I always react this way"?

The second component of depressive rumination, depressive reflection, is defined as engaging in contemplation: [to] REFLECT… [to] PONDER (Treynor et al., 2003). Reflection accompanies brooding in that when one broods one also engages in reflective tendencies (e.g., one takes notice of previously relevant events). Reflection works in conjunction with brooding by cycling the negative thoughts. In our previous example, Jon may criticize himself for not understanding the material (brooding), but he continues to reflect upon this failure, thereby increasing his vulnerability to depression. Depressive reflection is neutrally valenced; the act of reflecting upon previous events occurs without interpretation. In contrast, interpretation is negative in brooding. Depressive reflection will be measured by the Reflection sub-scale of the Rumination Response Scale (Treynor et al., 2003).

Anger rumination. The nature of rumination has been discussed in terms of depressive symptomology, but rumination also extends to anger. Anger is defined by Sukhodolsky, Golub, and Cromwell (1999) as a state of negative feelings that are associated with particular cognitive interpretations, physiological changes, and action

tendencies. Moreover, anger rumination is a consistent reflection upon these emotions, perpetuating and exacerbating the initial reaction to the provocation.

Anger rumination occurs along three different processes which Sukhodolsky and colleagues (2001) state are 1) memories of past anger experiences, 2) attention to immediate anger experiences, and 3) counterfactual thoughts about anger experience. To illustrate these processes consider how angry Jon became when studying for his exam. He may have had the thought "This material is too difficult! How is anyone supposed to understand this?" His anger reminds him of past experiences where similar situations have occurred "Well, I failed before, so chances are its going to happen again". He then question his actions (counterfactual thinking) "I might as well give up considering I'll never understand what is going on." If these thoughts continue to occur, Jon is likely to either give up on his end goal of achieving a high grade on the exam, or continue to become more frustrated by cycling through the same sequence of thought. In the previous example, Jon exacerbates his anger by consistently thinking about the provocation and what *could* have happened.

Sukhodolsky, Golub, and Cromwell (1999) claim that anger rumination is most representative of suppressed anger in that when anger is suppressed, the contents that provoked the anger cycle through thought. Once the event that initially caused the anger has passed, the individual then attends to thoughts regarding the event. Unlike depressive rumination, anger rumination is motivated by an approach strategy (Harmon-Jones, 2003; 2004) that is negatively valenced; the initial negative reaction to the provocation serves to locate solutions while in the process maintaining its negativity. This differs from

avoidance strategy in depressive rumination where depressive ruminators strive to avoid the initial reaction to the provocation (Whitmer & Banich, 2007).

What Rumination Isn't

Not intellectual reflection. Although rumination involves some form of reflection, it is not intellectual reflection. Intellectual reflection (also called philosophical reflection) is construed as a self-regulation tendency in which one directs attention towards one's thoughts and feelings with insight and introspect (Trapnell & Campbell, 1999). This ability to reflect on the meaning and motivation behind behaviors, actions, thoughts, and emotions of self and others is synonymous with psychological mindedness, a construct that is associated with significant advances in therapeutic progression (Appelbaum, 1973; Hall, 1992).

Intellectual reflection is adaptive when the individual can rationally consider the interpretations and potential solutions of a conflict (Trapnell & Campbell, 1999). It is a common tendency for an individual who is encountered with a problem to navigate their behaviors to ultimately search for a solution. These solutions hold a positive valence, leaving the individual hopeful of resolving a desired outcome. The solutions are active in approach, locating all potential solutions and deciding upon the best method to solve the issue at hand.

It is important to note that although depressive and intellectual reflection both involve the process of reflecting; however subtle differences demarcate both to create two separate processes. Intellectual reflection differs from the depressive reflection on several levels: first, intellectual reflection is said to be positively valenced (Whitmer & Banich, 2007); an individual who engages in intellectual reflection often does so in a manner that

leaves them feeling better. Second, intellectual reflection is an adaptive method of pondering whereas depressive reflection resembles a more neurotic self-focus (Trapnell & Campbell, 1999). Third, depressive reflection in conjunction with brooding is motivated by avoidance strategies rather than approach strategies found in intellectual reflection; those who intellectually reflect are attempting to approach the situation in order to find a solution.

Not worry. Rumination is also not synonymous with worry. Worry is one of the key characteristics that define anxiety disorders (APA, 2000). Borkovec, Robinson, Pruzinsky, and DePree (1983) define worry as a "chain of thoughts and images, negatively affect-laden and relatively uncontrollable; it represents an attempt to engage in mental problem-solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes; consequently worry relates closely to the fear process" (p. 10). Worry usually involves excessive thought and hypersensitivity of the future. It encapsulates a future oriented form of thought similar to the process of rumination, but should not be fused with the concept. The difference from depressive rumination is that in worry the event has yet to occur and thus there is still potential for finding a solution. When worry becomes excessive and unnecessary based on the circumstances, it interferes with daily functioning. Worry may take control of an individual making them engage in preventative techniques to avoid a perceived negative situation. With such a strong focus in protecting oneself, the individual cannot focus on the present moment.

Nolen-Hoeksema and colleagues (2008) distinguish rumination from worry on a number of facets. First, worry is future-oriented, rather than past or present-oriented. A

future-oriented focus is geared strictly towards anticipated threats. Rumination conversely focuses thought processes on self-worth, meaning, or themes of loss. The conscious motive for rumination is the desire to understand reasons while the motive for worry is to anticipate threats. The unconscious motive for worry is avoidance of core negative affect whereas rumination fosters avoidance of responsibility and of the aversive stimulus. These differences portray rumination and worry as distinct methods of taking action towards problems.

Hong (2007) found that worry is associated with both anxiety and depression but rumination is unique to depression. This may be due to the fact that the worry in anxiety is a preparatory behavior for uncertain future events. Rumination is a troublesome and negative loop of thoughts regarding past events and the present moment. Thoughts like "why am I this way" and "where did I screw up" flow through the mind. Likewise, there are attempts to rationalize and correct the actions that initially caused these thoughts.

Cognitive Processes in Rumination

Davis and Nolen-Hoeksema (2000) examined the connection of rumination with cognitive perseveration (i.e., persistent thinking). The Wisconsin Card Sorting Task (Berg, 1948) was used as a measure of perseveration based on the ability of the participant to match a stimulus card with a set of four additional cards with shapes that vary in color, design, or quantity. The subject is then asked to indicate which of the four cards matches the stimulus card on the same dimension (e.g., color, quantity of shapes) chosen by the experimenter. The participant is given 'yes' or 'no' responses after indicating the matching card. By correctly matching the stimulus card (e.g., red star) with one of the four cards (e.g., red circle) and continue to do so (e.g., red squares, red

triangles) the participant then understands the set. The extent to which they continue the same incorrect dimensional indicators (e.g., persistently thinking the card is matched based on color when it is matched on shape) indicates the level of perseveration. The analysis yielded a positive correlation between depressive rumination and perseveration on the Wisconsin Card Sorting Task, regardless of the level of depression one is experiencing. That is, the more one engages in rumination, the more likely they will continue suggesting the same dimensional characteristic to match cards.

Research has shown that rumination is also associated with certain cognitive deficits. Lyubomirsky, Boehm, Kasri, and Zehm (2007) reported dysphoric participants engaging in rumination to have diminished concentration on academic tasks, a need for additional time with reading comprehension, and impaired work strategies and poorer performance. These deficits can lead to greater difficulty in work and educational settings.

Theories of executive function indicate that there are three major executive deficiencies that influence macro level cognitive failures: inhibition, set switching, and updating of working memory (Miyake et al., 2000). To assess these deficits, Whitmer and Banich (2007) employed the backward inhibition task developed by Mayr & Keele (2000). This task analyzes the response pattern of participants and identifies areas of perseveration through reaction times to a stimulus. In this measure, participants are required to discriminate deviant rectangles that do not match an initial set of rectangles based on dimension, size, or movement. Respondents determine the deviant object based on its location in a 2x2 matrix (Whitmer & Banich, 2007).

Response times are indicative of either set switching or inhibition deficits. Switching is identified as the additional time needed to respond to non-inhibitory trials that contain two different sets of within two trials (e.g., change in dimension to change in motion) in comparison to repeat trials, which contain a similar task set (e.g., dimension and dimension). Inhibition is measured by the length of time it takes a subject to return to a previously defined task set, from the current one. The inhibition sequence contains similar beginning and end dimensions (e.g., size, motion, size). The differences in length of time from a recently abandoned task set (e.g., orientation, size, orientation) from a less recent abandoned set (e.g., orientation, size, motion, orientation) act as a measure of inhibition unrelated to switching ability (Whitmer & Banich, 2007).

Response times indicate how likely a subject is to inhibit previously learned schemas by the duration of reaction times; the reaction times will appear quicker in the inhibitory sets (e.g., orientation, size, orientation). Likewise, ruminators who have difficulty switching between previously learned spatial dimensions tend to maintain increased time frames between different sets when compared to non-ruminators, who yield faster times in control sets (e.g., orientation, size, motion).

Inhibition is defined by Whitmer and Banich (2007) as the inability to disregard previously learned mental sets when encountered with a new set. Inhibition "concerns one's ability to deliberately inhibit dominant, automatic, or prepotent responses when necessary (Miayake et al., 2000; p. 57)." That is, one will carry over previous schemas when interpreting new events, thereby perceiving the stimuli in terms of their schematic bias. Lyubomirsky and colleagues (1998) concluded that dysphoric subjects induced to ruminate tend to retrieve negative memories more consistently than those who are

induced to distract. These findings suggest that in an organic state, ruminators maintain a negative bias through an inability to inhibit negative thoughts. Joormann (2006) corroborated these findings, stating that those who report greater levels of rumination show greater deficits in inhibiting emotions. These emotions tend to be negative because of an inability to disrupt the negative thinking style with positive distractions (Joormann, 2005). Inhibition deficits bring about escapist behaviors such as binge eating or binge drinking in order to cope with the distressing thoughts, and may lead to co-morbid diagnoses with depression (Nolen-Hoeksema, Stice, Wade, & Bohon, 2007). Inhibitatory deficits can be illustrated as follows: if one takes notice of a group of people looking at them, they may assume that the group is making insults. This is because that same individual was previously harassed by peers earlier on in a similar context. Once the association of a group of people looking at the individual is made, then every similar context is interpreted in that light.

The inability to inhibit previous schemas is a form of "single-exposure mindlessness", coined by Ellen Langer (1989). Single exposure mindlessness is a premature cognitive commitment to a particular schema that prevents interpreting the environment from the view of a previously established schema. The individual cannot set aside what was learned previously and interpret the now context without a bias. Lewicki (2005) reported that schemas can be developed and sustained despite any apparent evidence; individuals sometimes create particular dispositions based on relations between variables that may or may not have a true or accurate relationship in the real world, may not be statistically supported as logical, and do not reflect exactly what the individual has encountered. Through rumination, the thought is cycled constantly throughout the mind

to a point in which it now becomes a perceived reality. With Jon, he cycles the thought of failure through his mind and neglects his intelligence from high school. There is evidence that he is intelligent, but he believes he is a failure.

The second executive function, set-switching, is defined as an inability to switch attention away from old information to new information (Monsell, 1996). Set-switching deficits may be seen in individuals who ruminate over recent failures and by doing so, pay less attention to new information. Hertel (1998) examined this deficit by asking dysphoric and nondysphoric individuals to recall lists of words. Participants were asked to learn the words followed with a rumination or distraction induction, or given no distractions (no instructions given) what so ever. The analysis yielded a hindered performance in dysphoric individuals instructed to ruminate. No differences were found in the distraction conditions. These results support the difficulty ruminators have with absorbing new information.

The third executive function of updating working memory is a function that requires monitoring and coding incoming information for relevance to the task at hand and then appropriately revising the items held in working memory by replacing old, no longer relevant information with newer, more relevant information (Morris & Jones, 1990). Joorman, Levens, and Gotlib (2011) studied this deficit by asking non depressed (control) and depressed participants (experimental condition) to remember the presentation order of a word set. The sorting costs (response latencies) were recorded for both backward trials (remembering the reverse order of presentation) and forward trials (remembering the order in which they were presented). Depressed participants were found to have higher sorting costs especially when presented with negatively valenced

words. Rumination was found to be predictive of sorting costs for negatively valenced words, but not with positive or neutral valence. The authors explain the deficit as a combination of both set-switching and inhibition deficit influences: "ruminators become stuck on recurrent thoughts that revolve around a specific theme and have difficulty flexibly switching to a new train of thought; such perseveration may reflect difficulties manipulating information in WM [working memory]." These perseveration deficits (set switching and inhibition: working memory) are considered to be two of the primary areas of maladaptive functioning which aid in the development and maintenance of depression in those who ruminate.

Cognitive Deficits in Depressive and Anger Rumination

To identify which cognitive deficit is associated with depressive rumination or anger rumination, Whitmer and Banich (2007) employed a task-switching test that can distinguish the two types of cognitive difficulties. They found that in depressive rumination there is a greater likelihood of deficits in inhibition, a natural proclivity to revert back to previously established schemas when interpreting new stimuli. Because both brooding and depressive reflection occur together to comprise depressive rumination, the cognitive deficits remain consistent across both thus suggesting that depressive reflection to have deficits in inhibition as well.

Inhibition is unique to depressive rumination; when controlling for depression it was found that "ruminative tendency was not associated with general cognitive slowing, poorer overall performance, or reduced task focus (Whitmer & Banich, 2007; p. 549)." Whitmer and Banich's (2007) reports corroborate Crane's (2009) position that "rumination, not depression or worry, is most highly associated with a lack of set

inhibition" (p. 549). Depressive rumination was suggested to primarily have deficits in inhibition, with set-switching occurring as a result of inhibitory deficits. The implications of this study suggest that depressive ruminators may experience great difficulty in relinquishing unattainable goals (Martin & Tesser, 1996; Pyszczynski & Greenberg, 1987) and negative thought patterns. It is important to note that depressive states are reliant on these self-perpetuating processes such as rumination and negative self focused thinking (Scherer-Dickson, 2004), in which case with the previous example of Jon, the cause for failure may vary depending on his level of depression. It can therefore be concluded that rumination plays a significant role as a cognitive component that perpetuates depression.

In contrast with depressive rumination, Whitmer and Banich's analysis showed that anger rumination was associated with switching difficulties rather than inhibition. When anger rumination takes precedence, the individual has difficulties understanding the new set of information. Consider Jon once again; when Jon begins to study, he immediately becomes angry once he cannot understand the first problem. This anger then prevents him from absorbing and processing new information.

Theoretical Perspectives of Rumination

Attempts to explain the development and maintenance of rumination can be found in two concurrent theories about rumination: Motivational and Structural Theory (Martin & Tesser, 1989) and the Response Styles Theory (Nolen-Hoeksema, 1987).

Motivational and Structural Theory of Ruminative Thought (MST). Martin and Tesser (1989) have constructed a motivational and structural theory that explains the development and maintenance of rumination. MST holds three basic assumptions; 1)

People's thoughts and actions are directed by goals, 2) these goals are structured hierarchically, and 3) if an important goal is not accomplished, individuals engage in a relatively specific sequence of behaviors.

Given that thoughts and actions are directed by goals, humans compare current states of being with their desired states, using the discrepancy as a measure of progress towards the desired goal. If the goal is achieved (homeostasis; the discrepancy is alleviated), then the individual may continue enjoying the benefits of achieving that goal, or begin the process of achieving a new goal. When one is working towards a goal, procedural knowledge is activated (Carver & Scheier, 1981) to direct the individual towards methods of attaining the goal.

The second assumption suggests that the goals that guide the mundane, everyday actions of people are placed in the middle of the hierarchy, where lower order goals are more likely to be pursued than higher order goals due to the ease of attainment and likelihood of success. When higher-order goals are identified but the individual is unaware of how to obtain those goals, they may ruminate to attempt to locate a solution.

The third assumption indicates that individuals engage in a relatively specific sequence of behaviors following frustration of an important goal. If the individual cannot attain the goal and leaves it incomplete, thought cycles will revolve around that goal causing distress about the incompletion. This hypothesis is known as the Zeigarnik Effect (Baumeister & Bushman, 2008, pg. 122). An illustration of the Zeigarnik effect is often seen in any case where the self-esteem is based on accomplishing goals. For example, a student working on an extensive report may be overwhelmed by the amount of work needed to complete the report. The fact that the assignment has yet to be completed

creates more distress, as the student may assume that the assignment may never get finished, in which case they would fail the course. In this case, the student recognizes the discrepancy between the lower order goal and the higher order goal. This cycle will continue until the moment the assignment is completed or no longer needs to be completed (e.g., drops the course).

The sequence of behavior following failure of goal attainment occurs in five stages. The first is repetition of the issue, which is circulated through thought, often times with greater intensity than previously. With more repetition, the less likely they are to find a productive response, and the more frustration of failure increases negative affect. It is not until the individual find an appropriate solution or relinquishes the goal will the rumination process cease. After gaining insight through repetition, the individual will attempt the second stage by troubleshooting possible solutions. Once the goal is deemed unattainable, a search for alternative solutions to achieve the goal is engaged. This process is usually conducted horizontally along the goal continuum, replacing previous medium or short term goals with more adaptable methods relevant to the issue (e.g., a student may realize studying does not work, so they seek help from a tutor). The extent of instrumental behaviors will determine the level of rumination one engages in as illustrated by the previous stage; without any solutions in store, one continues circulating the thought of failure, exacerbating their distress. If solutions are depleted, the only way to escape the rumination cycle is to forfeit the goal.

The third stage, end state thinking, often occurs when the individual has difficulty finding behaviors that will return them to the goal (Martin & Tesser, 1989). This is the point at which focus is no longer on the goal or problem, but rather on the feelings

associated with not reaching the goal. It is important to note that end-state thinking can be either positively valenced (satisfied goals) or negatively valenced (unaccomplished goals). If the feelings are initially positive in regards to the goal, then they will intensify and become more positive. Negative feelings result in more negative thought patterns with end-state thinking. It is more likely that neophytes will engage in end-state thinking because of the lack of experience with the goal; persons with more experience regarding that goal will have more options to choose from to find solutions. Those who do not have an extensive bank of options are more prone to end state thinking.

The fourth stage is that of negotiation. The influence of Zeigarnik tension maintains the initial goal as priority, forcing the individual to continue the ruminative process in search for an ample solution. Unlike end-state thinking where the content of thoughts can be positive, this stage is typically not pleasant. At this stage, the individual must decide to either give up the goal, or continue searching for lower-order goals to achieve the higher order goal. If the individual is persistent and continues the search, they will more than likely enter the fifth stage of learned helplessness. At this point, depression sets in as a result of constant failure of finding appropriate solutions towards their goals.

Overall, these assumptions provide groundwork for understanding the nature of rumination. According to Martin & Tesser (1989), the process of rumination can cease by relinquishing goals, thereby dissipating the Zeigarnik effect. If no solutions are found appropriate, this process can only be done at the negotiation stage, where the individual expels the goal from the hierarchy. The choice of continuing goal attainment or resigning will distinguish those with and without depression.

Response Styles Theory (RST). Response Styles Theory was developed to account for the development and maintenance of depressive rumination styles. According to Response Styles Theory (RST; Nolen-Hoeksema, 1987), depressive rumination is characterized by reflection (Morrow & Nolen-Hoeksema, 1990) in conjunction with a repetitive and passive focus on one's negative emotions (Nolen-Hoeksema, 2000; Nolen-Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema, Parker, & Larson, 1994). In Nolen-Hoeksema, Morrow, and Fredrickson's (1991) review of response styles theory, she proposes that people respond to their symptoms of depression, which thus extends the duration of the symptoms significantly. This is due to the ruminative response towards depression, which focuses on the causes and consequences of having depression. Those who distract themselves from their symptoms and therefore do not engage in rumination tend to have fewer symptoms than those who do not. The ruminative response acts as a cycle of negative thought which interferes with the instrumental behavior that will allow for problem solving.

Nolen-Hoeksema (1991) proposes three mechanisms that sustain depressive rumination and exacerbate symptoms of depression. In the first mechanism, ruminative coping styles of cycling negative evaluations influence thoughts on the self, which in turn influences affect. "Depression may be maintained when a vicious circle develops: depressed mood leads to negative attributions and self evaluations, which in turn contribute to more depressed mood, and so on" (Blaney, 1986; Ingram, 1984; Musson & Alloy, 1988; Teasdale, 1983; in Nolen-Hoeksema, 1991; p. 573).

The second mechanism concerns the interference with instrumental behaviors. Those who are locked into ruminative cycles often have difficulty engaging in behaviors

that provide reinforcement, hindering their sense of control. A lack of mastery over one's life contributes to learned helplessness, provoking depression further. The failed attempts at finding solutions to problems stem from deficits in instrumental behavior, which in turn leads to lower expectancies for success in the future, lower self-evaluations, and lower motivation to achieve goals (Nolen-Hoeksema, 1991).

The third mechanism refers to the notion that rumination may interfere with problems solving. The negative thought stream that cycles during rumination creates a negative perception of the self, reduces the motivation to attain goals due to the reduced esteem, which makes it less likely for one to engage in positive behaviors that will abate the depression. The inability to problem solve excludes the option of fighting the aversion, leaving the only option to flee. Without the motivation to combat the debilitating thoughts, the only option left is to avoid the feeling of failure, which is attained through continuously rationalizing their decision through a ruminative cycle, but only contributes to more symptoms.

RST was initially developed to explain the discrepancy between levels of depression in men compared to women that explained the differences in terms of coping mechanisms (e.g., rumination) (Nolen-Hoeksema, 1987), but now has expanded to become an overarching theory of depressive rumination. One should take note that the composition of RST specifically describes the maintenance of depressive rumination and not anger rumination.

Treating Rumination

Rumination can be alleviated by many of the same therapeutic techniques used to reduce depressive symptoms. In order to first break the thought cycle of rumination, one

can engage in distracting activities. Nolen-Hoeksema and colleagues (2008) suggest behavioral activation as a means of engaging in positive distracters (e.g., exercise) to reduce the focus on negative thought processes.

In Nolen-Hoeksema and Morrow's (1993) investigation of rumination and distraction induction, distraction was found to be efficacious in short term contexts. It is important that short term alleviation is emphasized, as distraction may lead to avoidance behaviors (Nolen-Hoeksema et al., 2008). Likewise, the issue that provokes negative thinking still exists, requiring further intervention to alleviate depression in the long term.

Nolen-Hoeksema and colleagues (2008) suggest a number of therapeutic interventions to target the long-term qualities of rumination while inhibiting avoidance tendencies induced by long term use of distraction. Among these treatments are interpersonal therapy, cognitive-behavioral therapy, and mindfulness-based therapies (MBCT, MBSR, ACT).

Nolen-Hoeksema and Davis (1999) noted a decrease in social support in those who chronically ruminate which bolsters their vulnerability to depression. People use confidants in order to disclose and alleviate much of their stress, but as the same stressors arise over and again when confiding, social support diminishes. The interpersonal complications that arise due to rumination are addressed in interpersonal treatments. Interpersonal therapy has been found to be efficacious in reducing depression (Weissman & Markowitz, 2002) and rumination (Nolen-Hoeksema et al., 2008). Problems in the social context occur often in those who are prone to rumination, regardless of depression (Nolen-Hoeksema & Davis, 1999). Clients can regain the social support system that was compromised due to the rumination through the development of adaptive social skills.

Cognitive behavioral treatments are an additional method of treatment for alleviating ruminative coping styles. Cognitive therapy works by educating clients on ways to stand apart from negative cognitions and challenging the content as they occur (Barber & DeRubeis, 1989; Teasdale, Segal, & Williams, 1995). The biased and maladaptive nature of ruminative thoughts are questioned to invalidate the content, reducing the extent to which they can be perceived as reality. Nolen-Hoeksema et al., (2008) found cognitive therapies to be effective in countering avoidance strategies present in rumination.

Mindfulness-based treatments have been empirically supported as an effective method of prevention relapse of depressive episodes (Teasdale et al., 2000) by teaching clients to interpret feelings and thoughts non-judgmentally. The client learns to distance the self from thoughts thereby reducing the fixation towards those thoughts. Mindfulness treatments emphasize attentional control as a process of disassociating from negative thought networks. Mindfulness-based interventions reduce the avoidance often seen in rumination by accepting aversive thoughts as they occur and not reacting to whatever arises in the consciousness (Kabat-Zinn, 1995; Roemer, Salters-Pedneault, & Orsillo, 2006). This process teaches the individual to allow depressive thoughts to pass through consciousness without becoming engulfed in thought (Segal et al., 2002; Teasdale et al., 1995). This distancing from thought reduces the influence of rumination over the individual.

Goals of Present Study

The current study investigated the association of mindfulness with reduced levels of depressive and anger rumination and whether its relationship with depressive/anger

emotional states is mediated by rumination. It is important to note, however, that mindfulness was examined as a trait rather than as a state. In the latter, mindfulness is often induced through mindfulness training or meditative practices. The current study only assessed the relationship between rumination and mindfulness as a predisposition or inclination. Thus, results of the study were simply correlational. Nonetheless, the study facilitated the identification of facets of mindfulness that can be tested later for their causal value. Given this clarification, the current study answered the following set of questions:

1) Are individuals who are more mindful less likely to engage in depressive or anger rumination?
2) Which of the five facets of mindfulness are most predictive of lower levels of depressive and anger rumination?
3) Is the relationship of mindfulness with depression mediated by depressive rumination?
4) Is the relationship of mindfulness with anger mediated by anger rumination?

Are individuals who are more mindful less likely to engage in depressive or anger rumination? The current study predicted inverse relationships between mindfulness and depressive as well as anger rumination. Teasdale and colleagues (1994) state that "rather than getting caught up in ruminative, elaborative thought streams about one's experience, its origins, implications and associations, mindfulness involves a direct experience of events in the mind and body" (in Bishop et al., 2004; p. 232) In other words, through acting mindfully, one cannot ruminate, because the present moment experience

counteracts the past orientation of ruminators. This conclusion can be explained by the processes that occur when engaging with one's environment mindfully.

One of the features of mindfulness is that of cognitive defusion (Hayes et al., 1999). Defusion is the act of distancing oneself from the biased internal states that comprise rumination; acting as if thoughts, feelings, and emotions are physical entities rather than true realities of the self. When one is able to break away from fixations, it allows for more focus on the true, present depiction of the self, free from bias. When acting mindfully, one focuses primarily on the physical sensations and how they change from moment to moment. Thoughts and feelings are observed as events, rather than features of the self, which defuses the fixation of thought from self concept. With this defusion, maladaptive thoughts have less influence over one's well being (Hayes, 1999).

Rumination is characterized by a *doing mode*; a method of taking control while engaging in the environment to adjust and function in the environment. This is in contrast to the being mode, which is the state of simply existing, not attempting to control the environment; experiencing what occurs without any action (Williams et al., 2007). In a practical sense, it is important to be in a doing mode at times to sustain efficiency in our everyday tasks (Lewicki, 2005). However, consistently utilizing previous schemas in the doing mode may often lead to more cognitive failures (e.g., blunders; Herndon, 2007). To reduce these cognitive failures, one must break previous schemas by first approaching the context in a mindful manner, that is, interpreting the environment as a novel context. After this interpretation is established, one can enter the doing mode and perform given actions needed to complete a task. In rumination, one is constantly in a doing mode, where no attention is given to the current context. If the individual can first enter a being

mode and understand that the context is not equivocal to the previous provocation, then it is more likely that the ruminative cycle will be broken.

Previous research has found that the components of rumination have a tendency to decrease as levels of mindfulness increase (Jain et al., 2007; Kingston et al., 2007; Ramel et al., 2004). The facets of mindfulness can therefore be considered as a useful mechanism in counteracting rumination. Jain and colleagues (2007) conducted an empirical study analyzing the efficacy of stress reduction of mindfulness based techniques over relaxation techniques. Participants were placed in one month of mindfulness training or a somatic relaxation training course. No significant differences were observed in psychological distress or distractive/ruminative thought processes when comparing meditation and somatic relaxation experimental groups. Mindful meditation yielded significant decreases in ruminative thought from pre to post test analyses. Their results concluded that meditation's effects on reducing distress were partially mediated by reducing rumination compared to a control group.

In a similar study, Ramel and colleagues (2004) conducted an 8-week mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990) course on affective symptoms, dysfunctional attitudes, and rumination. Similar to Jain et al.'s (2007) findings, ruminative tendencies were reduced through the modification of cognitive processes induced in a mindfulness based therapeutic curriculum. By teaching participants a new method of "allowing thoughts to pass by in the stream of consciousness," they were able to reduce the fixation one has with thoughts when ruminating. The end result was a reduction in ruminative processes which in turn reduced depressive symptoms.

Kingston (Kingston et al., 2004) used the Mindfulness Based Cognitive Therapy (Segal et al., 2002) curriculum to examine the influence mindfulness has in reducing residual depressive symptoms, particularly the role of rumination in depressive individuals. Nineteen patients in a remission period of depression were subjected to either an MBCT treatment paradigm or treatment as usual. Significant reductions in depressive symptoms including rumination were found at the end of the MBCT course, with greater reductions at a one-month follow up. The authors concluded that MBCT treatments have a significant effect towards residual depressive symptoms. The cognitive modifications towards one's thoughts MBCT instills in the participants is suggested to mediate the relationship between mindfulness and rumination (Kingston et al., 2004) but a mediation analysis was not conducted.

Finally, in a correlational analysis of the influence of mindfulness over anger rumination, Borders, Earleywine, and Jajodia (2010) found a pattern of correlations suggesting rumination to partially mediate a link between mindfulness and symptoms of anger (with the exception of physical aggression). The authors used structural equation modeling (SEM) to test if rumination mediated the relationship between mindfulness and aggression. Their analyses indicated that rumination partially mediated the association between mindfulness and anger. The results support mindfulness as an agent in reducing rumination, breaking the link with many aggressive behaviors associated with anger (e.g., hostility and verbal aggression).

Overall, mindfulness meditation has been shown to yield reductions in distractive and ruminative thoughts and behaviors (Jain et al., 2007; Kingston et al., 2007; Ramel et al., 2004; Borders et al., 2010). This provides a unique mechanism by which mindfulness

meditation reduces distress, supporting third wave treatments that embrace mindfulness as an agent of healing. The current study predicted a high likelihood that those who are more mindful will exhibit lower levels of both forms of rumination. These findings will serve to corroborate previous studies ascertaining the rumination/mindfulness relationship.

Which of the five facets of mindfulness are most predictive of lower levels of depressive and anger rumination? The previous findings presented above suggest a need to better understand the relationship mindfulness has with rumination. The current study examined this relationship by determining the predictive role that each of the five facets of mindfulness have with rumination. Mindfulness was conceptualized under the three-axiom theory of Shapiro, Carlson, Astin, and Freedman (2006). This theory is consistent with the three axioms presented in Kabat-Zinn's (1994) conceptualization of mindfulness: "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally" (p. 4). These three axioms which the five facets fall under are 1) Intention, 2) Attention, and 3) Attitude. Intention describes one's drive for practicing mindfulness. In order for one to understand mindfulness and act upon all of its facets genuinely, one must have the intention and will to practice mindfulness. The second axiom, 'Attention' encompasses the harboring of the present moment. The facets of 'acting with awareness' and 'observing' best represent the axiom of 'Attention' as both refer to taking in and acting upon the present moment. The third axiom of 'Attitude' refers to the way one interacts with internal and external provocations as well as accepting the context without judgment. The facets of 'non-judgment' and 'non-reactivity' both represent this kind of attitude.

'Awareness' is a quality of mindfulness that contrasts with rumination. Unlike rumination, awareness takes note of sensations in the present moment experience. Rather than thinking about the past (Roemer & Orsillo, 2003). When engaging with the environment mindfully, one is more focused on the task at hand rather than the negatively biased transient thoughts; it is not that mindfulness is a distraction technique, but rather is a method of taking notice at that moment and leaving it behind in the next (Kabat-Zinn, 1990).

It is likely that when people score high on 'acting with awareness,' that they will attend to the present moment and not act in a habitual doing mode of mind. Thus, their thoughts, emotions and behaviors become truly responsive to the situation at hand and are not predetermined by habitual modes of thinking, feeling, and acting. It was expected that they would be less likely to engage in depressive and anger rumination where information is routinely referenced, processed, and acted upon using previous schemas.

'Observing' (or attention to the present moment) also contrasts with rumination. Attention is often associated with higher levels of pleasure derived from the stimulus of focus (LeBel & Dube, 2001). However, Brown and Ryan (2003) posit that high-levels of self-focused attention in the present moment may lead to greater mood disturbances and distress. This happens during rumination when one does not pay attention to their current internal or external sensations. The focus is primarily on the initial provocation and the dysfunctional thoughts that follow. In contrast, mindful individuals observe the current context (both externally and internally), easing the influence dysfunctional thoughts have over one's well being. Although the attention of negative events Brown and Ryan (2003) was supported to lead to greater psychopathology, this type of attention alone is negligent

of non-judgmental awareness. Mindful individuals leave judgments behind, giving them the ability to see the environment without any biased schematic interpretation. Therefore, it is likely that those who are mindful would attend more to the present moment rather than events in the past that depressive and anger ruminators often reference.

Rumination cycles negatively biased thought through the mind. In contrast, the 'non-reactivity' facet of mindfulness inhibits any sort of judgment and bias that influences interpretation. It welcomes the initial reaction without avoiding, or escaping from the internal experience, regardless of the valence (Bishop, 2002). By not reacting, one ceases judgment which will ultimately remove the biased perceptions of reality. When bias is reduced, brooding (or negatively biased pondering) is less likely to occur.

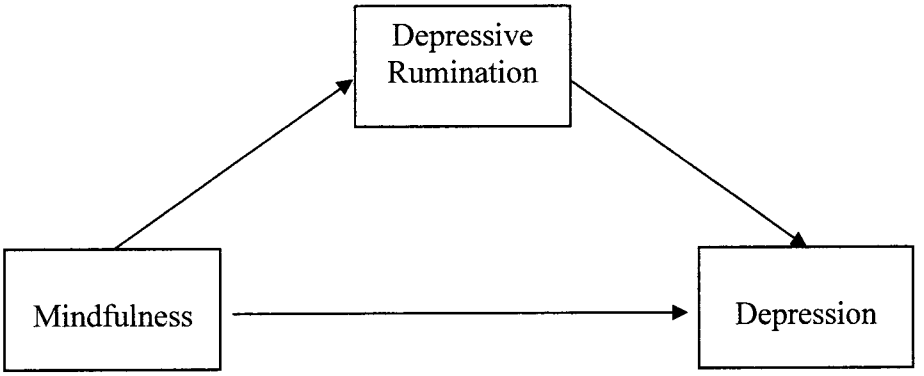
By not judging the current situation, one is not evaluating it. Mindfulness prevents the negative valence in depressive rumination by eliminating the mechanism (judgment) that produces that negative bias. In addition, mindfulness takes into account other information other than the self (e.g., the context) which prevents the neurotic self focus of rumination (Trapnell & Campbell, 1999). It is likely that more mindful individuals who are less judgmental of previous provocations and more willing to accept the situation and reaction for what it is will less likely engage in any sort of rumination.

In sum, the current study predicted that the facets of mindfulness that parallel the axioms of 'Attention' ('observing' & 'awareness') and 'Attitude' ('non-reactivity' & 'non-judgment') will be all predictive of mindfulness. However, given the exploratory nature of the study, it was unclear as to which of the four facets would be more predictive than the others. Would the facets representing the axiom of 'Attention' be more predictive than the ones encompassing 'Attitude' (or vice-versa)? On the other hand, the

facet of 'describing' was expected to not be as critical as a predictor compared to the other four. Conceptually, it does not directly contribute to 'Attention' or 'Attitude'.

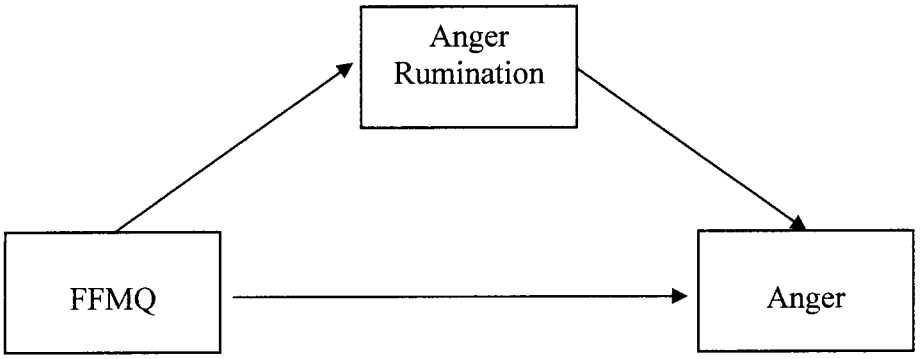
Is the relationship of mindfulness with depression mediated by depressive rumination? Given that mindfulness has been shown to be positively associated with well-being, the current study further examined if such a relationship occurs because of reduced levels of rumination. The third research question asked if mindfulness is associated with lower levels of depression and whether this relationship is mediated by reduced levels of depressive rumination. In other words, are individuals who are more mindful less likely to engage in depressive rumination and, in turn, less likely to experience depression? Given depressive rumination's relationship with depression (Nolen-Hoeksema et al, 2008; Treynor et al., 2003), mindfulness' inverse connection with depression (Shapiro et al., 2008; Brown, Ryan, & Creswell, 2007), and mindfulness' inverse correlation with depressive rumination (Ramel et al., 2004), it was likely that depressive rumination would mediate the relationship between depression and mindfulness. Such a mediation was suggested by Kingston and colleagues (2004) but not tested. For a diagram of this potential mediation, see Figure 1.

Figure 1: Mindfulness and Depression as Mediated by Depressive Rumination



Is the relationship of mindfulness with anger mediated by anger rumination? The fourth research question asked if mindfulness is associated with lower levels of anger and whether this relationship is mediated by reduced levels of anger rumination. In other words, are individuals who are more mindful less likely to engage in anger rumination and, in turn, less likely to experience anger? Given anger rumination's association with perpetuating anger (Sukhodolsky et al., 2001), the inverse correlation of mindfulness and anger rumination (Borders et al., 2010), and the inverse relationship mindfulness has with qualities of anger (Lynkins, 2006), it was likely that rumination mediates the relationship between mindfulness and anger. Individuals who yield higher levels of trait mindfulness are therefore more likely to have lower levels of rumination tendencies, and thus lower levels of depression and anger. For a diagram of this anticipated mediation, see Figure 2.

Figure 2: Mindfulness and Anger as Mediated by Rumination



Method

Participants

Eastern Illinois University students (N = 132) enrolled in introductory psychology courses were asked to participate in the current study. Individuals who participated in the study were given an incentive of extra credit to apply to their course grade. Of the 132 participants who reported their ages, 92.4% were between the ages of 18 to 21 years old (M = 19, Mdn = 19), 61.4% of which were enrolled in their first year at the university. The gender of the obtained sample was primarily comprised of a female demographic (n = 111, 84.1%). Of the 132 participants who reported their ethnicity, 84 (63.6%) were White/Caucasian, 31 (23.5%) Black/African American, 7 (5.3%) multi-ethnic, and 6 (4.5%) Hispanic. The remaining 3.1% consisted of Asian American, Native American, or other unlisted demographics.

Materials

Five-Facet Mindfulness Questionnaire. The Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) was used to determine the level of trait mindfulness of the participants. The scale was first developed to extract elements from preexisting mindfulness scales in efforts to conceptualize mindfulness in terms of

individual facets. Baer and colleagues (2006) conducted an exploratory factor analysis that yielded 39 items loaded on five facets; 'observing', 'describing', 'acting with awareness', 'non-judging', and 'non-reactivity'. All factors are rated on a five point likert scale (1 = Never or vary rarely true, 5 = Very often or always true) to depict the extent to which one engages in a particular mindful facets. Accounting for reverse scored items, elevated scores indicate greater frequencies of the respective mindful trait. A unidimensional measure of mindfulness can be obtained by summing all scores from each of the five facets. As with individual facets, elevated scores on the FFMQ infer greater frequency of mindful behavior.

The 'observing' facet of the FFMQ includes eight items (item 1, 6, 11, 15, 20, 26, 31, 36) that have been derived from the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith & Allen, 2004), an inventory that encompasses many of the traits of mindfulness outlined in Linehan (1993). Examples of items measuring observation include "When walking, I deliberately notice the sensations of my body moving" or "When I take a shower or bath, I stay alert to the sensations of water on my body." Elevated scores on this facet reflect the likelihood that an individual is able to notice specific sensations and attend to these situations without the habitual tendency to latch on to positive stimuli, or flee from aversive stimuli.

The 'describing' facet consists of eight items (items 2, 7, 12R, 16R, 22R, 27, 32, 37) which were derived from both the KIMS (Baer et al., 2004) and the Cognitive and Affective Mindfulness Scale (CAMS; Feldman, Hayes, Kumar, & Greeson, 2004). Examples of describing include "I'm good at finding words to describe my feelings" and I can easily put my beliefs, opinions, and expectations into words." Elevated scores on

this scale suggest an enhanced ability to describe one's internal events such as emotions, feelings, and thoughts.

The eight items that comprise the 'awareness' facet (items 5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R) were extracted from the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), KIMS (Baer et al., 2004), and the CAMS (Feldman et al., 2004). Examples of 'awareness' items include "When I do things, my mind wanders off and I'm easily distracted" or "I can easily put by beliefs, opinions, and expectations into words". The 'awareness' facet is reverse scored, with higher scores indicating greater ease in maintaining attention and awareness, ultimately leading to greater instances of cognitive failures.

The eight items comprised of the 'Non-judgment' facet (3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R) were extracted items from the KIMS (Baer et al., 2004) and Mindfulness Questionnaire (MQ; Chadwick, Ember, Mead, Lilley, & Dagnan, 2005). Examples of such items include "I criticize myself for having irrational or inappropriate emotions" and "I tell myself I shouldn't be feeling the way I'm feeling." The items on this scale are reverse scored to infer that elevations indicate fewer occurrences of judgment towards the self and others.

The seven 'non-reactive' facet items were derived from both the Frieberg Mindfulness Inventory (FMI; Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006) and the MQ (Chadwick et al., 2005). Examples of 'non-reactive' scale items (items 4, 9, 19, 21, 24, 29, 33) include "I perceive my feelings and emotions without having to react to them" or "I watch my feelings without getting lost in them" (Baer et al., 2006).

Higher scores on this facet reflect a greater ability to relinquish a fixation on thoughts, and to allow a constant permeation of thought flow without any sort of action.

The FFMQ scores were found to have predictive validity given an observed direct relationship with positive psychological constructs including emotional intelligence, openness to experience, and self-compassion. Scores were inversely related to several negative psychological attributes as well, including alexithymia, dissociation, absent-mindedness, psychological symptoms, neuroticism, thought suppression, difficulties with emotion regulation, and experiential avoidance (Baer et al., 2006).

The FFMQ has good internal consistency, with alpha coefficients ranging from .75 to .91 (Non-reactivity = .75; Observing = .83; Acting with Awareness = .87; Describing = .91; Non-Judgment= .87). The facets were determined to be related but distinct from one another after the analysis of inter-item correlations for all scales yielding significant results with the exception of 'observe' with 'non-judgment.' The sums of each scale can be compiled together to indicate a unidimensional measure of mindfulness. For the full scale, see Appendix B.

Ruminative Responses Scale. The Ruminative Responses Scale (RRS) has undergone several revisions to differentiate the items on the scale from those which were used in scales of depression (i.e., Beck Depression Inventory). Currently, the developers (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) have developed a 10 item scale that differentiates between two components of depressive rumination: brooding (B) and depressive reflection (R). The 10 item RRS consists of two factors that are intended to indicate ruminative tendencies. The brooding subscale asks participants to indicate the extent to which they harbor thoughts and questions such as "What am I doing to deserve

this?" and "Why do I always react this way?" The reflection subscale analyzes the influence of emotion on the participant's current state by asking participants to "analyze recent events to try to understand why you feel depressed" and "go someplace alone to think about your feelings". An overall score of depressive rumination is calculated by combining the scores on both the R and B scales of the RRS. The obtained score is indicative of the level of depressive rumination one engages in routinely.

The previous version of the RRS (Nolen-Hoeksema, Larson, & Grayson, 1999) included 12 additional items measuring depression-related symptoms, but were removed due to the overarching goal of differentiating the act of ruminating from depressive symptoms (Treynor et al., 2003). The revised version of the RRS was factor analyzed using a varimax rotation. The results yielded two separate factor loadings; the first consisted of items that began with the word "think," whereas the second factor did not contain any of these items. The first factor was deemed reflection, based on the neutral valence and the correspondence with definition of rumination, which includes reflection as one of the components. Psychometric analysis yielded a coefficient alpha for the reflection (R) subscale of .72, additionally finding a test-retest correlation of $r = .60$. The second factor was determined to be brooding, a neurotic style of pondering, which also coincides with the definitive qualities of the construct. A coefficient alpha for the Brooding Subscale (B) was found to be .77, with a test-retest correlation of .62. Overall, the revised scale items were found to share 50.5% of the total variance in rumination scores. For the full scale, see Appendix C.

Center for Epidemiological Studies Depression Scale. The Center for Epidemiological Studies Depression Scale (CES-D) was designed for research purposes

to assess current levels of depression in non-clinical samples (Radloff, 1977). The CES-D is a symptom checklist comprised of 20 items rated on a likert scale from 0 (Rarely or none of the time (less than 1 day) to 3 (All of the time (5 – 7 days)). All items are rated by how often they have occurred over the past week. Examples of the items include "I felt that I could not shake off the blues even with help from my family or friends" and "I thought my life had been a failure." The CES-D is scored by summing responses (items 4, 8, 12, and 16 reverse scored) to obtain a score ranging from 0 to 60. Higher scores on the CES-D indicate a higher occurrence of depressive symptoms. Shean and Baldwin (2008) suggest a standard cut-off of 16 as a clinically depressed profile. Radloff (1977) suggests scores of 15 or below to indicate non-depressed individuals and can be used as a control group in empirical studies.

The CES-D has been supported as a reliable measure of assessing depressive symptoms across a variety of demographic variables. Radloff (1977) has reported high internal consistency in both non-clinical (α = .85) and clinical samples (α = .90) with a strong ability to discriminate between both populations. Convergent validity was established with the Hamilton Clinician's Rating scale and the Raskin Rating Scale, yielding correlations ranging from .69 to .75. Discriminant validity was established with the Bradburn Positive and Negative Affect Scale among non-clinical samples with significant correlations ranging from .60 to .63 with negative affect and -.21 to -.25 with negative affect. Clinical samples also yielded significant correlations with negative (r = .55, $p < .01$) and positive affect (r = -.55, $p < .01$). The developers also assessed concurrent validity of progressing psychiatric patients, finding mean depression scores to significantly decrease within four weeks from admission. Decreases in scores were

consistent across the CES-D, SCL 90, Hamilton Clinical Rating Scale, and Raskin Rating Scale.

The CES-D in the current study was used as a unidimensional measure of depression. Factor analyses of the CES-D yielded four eigenvalues greater than one, accounting for 48% of the variance in depression scores. However, due to the high internal consistency of the instrument, the authors suggest interpretation of a unidimensional measure of depression rather than a multi-faceted measure. For the full scale, see Appendix D.

Anger Rumination Scale. Current measures of anger have yet to encapsulate the qualities of anger rumination. The ARS "measures the tendency to focus attention on angry moods, recollection of past anger experiences, and thoughts about the causes and consequences of anger episodes" (Sukhodolsky et al., 2001; p. 689).

Anger rumination is considered to best resemble the current State Anger Expression Inventory (STAXI; Spielberger, 1988) construct of Anger-In, which is the extent one engages in suppressing anger. Anger-In is considered to be the tendency to hold one's anger in without any outlet. Anger rumination constitutes what occurs subsequent to anger suppression. Typically, those who engage in anger rumination reflect upon moment of anger and often have fantasies of retaliation (Sukhodolsky et al., 2001).

The authors of the ARS developed 30 items that were hypothesized to comprise anger rumination. Examples of these items include: "I re-enact the anger episode in my mind after it happened" and "I keep thinking about events that angered me for a long time." After a review of the clarity and ambiguity of the items, the total pool was reduced to 25 total items. Analysis of the 25 remaining items yielded an internal consistency

coefficient of α=0.93 with item to total correlations ranging from 0.39 to 0.75. Kurtosis and skewness was analyzed and yielded no significant deviations from normality among the items. Exploratory factor analyses were conducted to determine loadings among the items. Principal axis analysis followed by the Oblimin rotation with Kaiser nomination yielded a four factor solution explaining 54% of the total variance of anger rumination. Six items failed to load on these four factors during the exploratory factor analysis, thus reducing the 25 item total to 19 total items that comprise the ARS. Each of the remaining items yielded factor loadings ranging from 0.31 to 0.77.

The first of the four factors encapsulates angry afterthoughts which the authors consider to be related to the cognitive rehearsal of recent anger episodes. The second factor is revengeful thoughts. The composition of these thoughts revolves around idea of retribution in regards to the initial provocation. Angry Memories factor is the third factor, which is defined as thoughts related about anger episodes of the past. The final factor is an understanding of causes. The Understanding Causes factor reflects the thinking about the causes of anger events. The overall score obtained is indicative of the extent to which one engages in anger rumination on a consistent basis. Elevated scores on the ARS indicate a greater likelihood of an individual to engage in unintentional recurring cognitive cycling related to anger experience and expression.

Subsequent to establishing the factor loadings, test-retest analysis yielded a reliability coefficient of 0.77 derived from 179 of the participants involved in the development. Several measures yielded significant correlations with measures of anger. Among these scales were the STAXI, the Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), Negative Affectivity Scale (Stokes & Levin,

1990), and the Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985). For the full scale, see Appendix E.

Clinical Anger Scale. The Clinical Anger Scale (CAS; Snell, Gum, Shuck, Mosley, & Hite, 1995) was developed to provide a method of assessing components of anger as well as to provide a means of measuring contributions of various components of anger to the development and maintenance of medical conditions. The CAS consists of 21 statements assessing anger now, anger about the future, anger about failure, anger about things, angry-hostile feelings, annoying others, angry about self, angry misery, wanting to hurt others, shouting at people, irritated now, social interference, decision interference, alienating, others, work interference, and sexual interference (Snell et al., 1995). The composition is similar to the Beck instruments of psychopathology where items consist of four statements of various levels of anger (e.g., Item 1: A. I do not feel angry, B. I feel angry, C. I am angry most of the time now, and D. I am so angry all the time that I can't stand it). Items are scored on a 4 point likert scale (A=0, D=3) and summed together to determine the level of anger one experiences. Scores of 0-13 indicate minimal clinical anger, 14-19 mild clinical anger, 20-28 moderate clinical anger, and 29-63 severe clinical anger.

The CAS yielded significant internal consistency coefficients of .92 to .95 between females and males respectively, with an overall coefficient of .94. In addition to internal consistency, test-retest reliability correlations support strong consistency between administration of the measure (r =.78; females r = .77; males r =.85). Convergent validity analyses with the State-Trait Anger Expression Inventory (STAXI; Spielberger & Sydeman, 1994) support the CAS as a valid measure of clinical anger, finding strong

positive correlations between instruments. The CAS is also found to be related to elevated levels of hostility and psychopathology on the SCL-90-R and neurotic personality types assessed by the Eysenck Personality Inventory and Goldberg Big-5 Scale.

The contamination of responses due to bias was found to not be influenced by social desirability evidenced by non-significant relationships with measures of social desirability and the EPI Lie Scale. Interpretation of responses was also not influenced by gender differences. An analysis of variance yielded no significant differences among males and females on any aspect of the instrument. For the full scale, see Appendix F.

Procedure

Participants were administered all scales through The Experiment Management System (SONA), an online survey data collection system. Prior to the study, participants were informed of potential harms that may occur in the study and given the option to withdraw from participation at any time without any repercussions. They were informed of their confidentiality, and encouraged to respond in a candid manner.

Participants were first given a demographic questionnaire, followed by a battery of five measures. The order of presenting the measures was counterbalanced to avoid order effects. Once all measures were completed, the participant was debriefed to address the purpose of the study, as well as given contact information for further questions or concerns regarding the study. The average length of completion was 21.5 min (SD = 8.75).

Results

The present study investigated the relationship between mindfulness, depressive/anger ruminative coping styles, and depression/anger. The dependent (predicted) variables were the states of depression and anger. Mindfulness, the independent variable or predictor, was measured as a trait (as opposed to an induced state) with five aspects: 'observing', 'describing', 'non-judging', 'non-reactivity', and 'acting with awareness'. The proposed mediating variables between mindfulness and depressive and anger states were depressive rumination and anger rumination respectively.

Internal Consistency of the Various Measures

Cronbach's alpha coefficients were calculated for each of the measures in the study. Most measures used in the study exhibited high internal consistency as shown in Table 1. The Cronbach value for 'non-reactivity' was close to being acceptable (.70) using rules of thumb provided by George and Mallery (2003) but is proportionally consistent with Baer and Colleague's (2006) alpha level found in the test development phase ($\alpha = .75$).

Table 1

Internal Consistency of the Various Measures (N = 132)

Measure	Cronbach's α
Five Facet Mindfulness Questionnaire	.84
Observe	.81
Describe	.89
Acting with Awareness	.86
Non-Judgment	.89
Non-Reactivity	.67
Rumination and Reflection Questionnaire (measure for depressive rumination)	.88
Center for Epidemiological Studies – Depression (measure for depression)	.88
Anger Rumination Scale (measure for anger rumination)	.94
Clinical Anger Scale (measure for anger)	.89

Description of the Study Sample

Of the 132 participants who completed the measures, 9 were excluded from the analysis based on extreme outlier values using the standardized residuals, Mahalanobis distances, and Cook's distances as criteria for removal. Table 2 shows the means and standard deviations of each of the study variables. To assist the reader in interpreting the means for measures that had no cutoffs specified by the test developers, one sample t-tests were conducted to examine if the means were significantly different from the midpoints of the scale (See Table 2).

Table 2

Descriptive Statistics on Mindfulness, Anger, Depression, and Proposed Mediators (N = 123)

Variable	M	SD	Possible Range of Scores	Scale Midpoint
Mindfulness (unidimensional)	123.17	16.53	39 - 195	117
Mindfulness Facets				
Observe	25.31	5.88	8 – 40	24
Describe	25.84	6.53	8 – 40	24
Acting with Awareness	25.86	5.66	8 – 40	24
Non-Judgment	25.74	6.81	8 – 40	24
Non-Reactivity	20.42	3.82	7 – 35	21
Depression	16.20†	9.56	0 - 60	30
Depressive Rumination	21.50	6.60	10 - 40	25
Anger	8.01†	6.81	0 - 63	31.5
Anger Rumination	36.11	11.32	19 - 76	47.5

Note. † = Cutoff points were specified by the test developer

Though not at the higher end of the scale, average unidimensional mindfulness scores for participants fell slightly above the midpoint. This indicates that these individuals more often than not, attend to internal and external experiences mindfully. More specifically, these individuals tend to observe their experiences, to describe sensations associated with events, act with awareness in the present moment, and refrain from judging their reactions towards those events. The participants had an average tendency to react towards internal or external experiences.

Participants yielded lower levels of depressive rumination. This range of scores suggests a tendency of the participants to engage less in depressive rumination over previous failures or events beyond their control. On the other hand, participants scored at what Shean and Baldwin (2008) suggest to be a clinically depressed profile (cutoff point

of 16). These participants are likely to have several thoughts and behaviors that are consistent with an individual with clinical depression; however depressive thoughts are less likely to be caught in a ruminative cycle.

Both anger and anger rumination scores were found to exhibit low levels of anger-related activity in participants. Participants scored within the range ($M = 8.01$) of what Snell and colleagues (1995) suggest to indicate minimal clinical anger (between 0 – 13). They were also found to engage in lower levels of anger rumination. These results indicate that participants seldom have anger-related experiences or aggressive outbursts. Any anger-related episode is typically contained and is seldom ruminated upon to the point of impairment.

First Research Question: Are Individuals Who Are More Mindful Less Likely to Engage in Depressive or Anger Rumination?

Mindfulness as a one-dimensional trait was found to be significantly correlated with depressive rumination ($r = -.38, p < .001$) and anger rumination ($r = -.41, p < .001$). These indicate that individuals who are more mindful are less likely to engage in both depressive and anger ruminative thought cycles.

Second Research Question: Which of the Five Facets of Mindfulness are Most Predictive of Lower Levels of Depressive and Anger Rumination?

A multiple regression analysis was conducted to examine how the five facets of mindfulness ('observe', 'acting with awareness', 'describing', 'non-judgment', and 'non-reactivity') predicted depressive rumination. The results indicate that this set of predictors accounted for 50% of the overall variance with depressive rumination $F(5, 117) = 23.69$, $p < .001$. 'Non-judgment' was found to account for the majority of the variance (45%), p

< .001. As participants cease evaluation and judgment of internal and external experiences, they are less likely to ruminate over anger experiences. The remainder of the predictors was not found to be statistically significant. A summary of the results are found in Table 3.

Table 3

Summary of Multiple Regression Analysis for Mindfulness Facets Predicting Depressive Rumination (N=123)

Variable	*B*	*SE B*	*β*
Observe	.16	.08	.14
Act with Awareness	.01	.09	.01
Describing	.01	.08	.01
Non-Reactivity	-.14	.13	-.08
Non-Judgment	-.65	.08	-.67***

Note. $R^2 = .50$; adjusted $R^2 = .48$
* $p < .05$ ** $p < .01$ *** $p < .001$

A second multiple regression analysis was also conducted to examine how the five facets of mindfulness ('observe', 'acting with awareness', 'describing', 'non-judgment', and 'non-reactivity') predicted anger rumination. The results indicate that this set of predictors accounted for 47% of the overall variance with anger rumination $F(5, 117) = 20.96$, $p < .001$. 'Non-judgment' was found to account for the majority of the variance (28%), $p < .001$. The remainder of the variance was explained by 'observation' (5%), $p < .01$ and 'non-reactivity' (4%), $p < .01$. As participants cease evaluation of internal and external experiences, they are less likely to ruminate over anger experiences. Likewise, participants who have a greater proclivity to pull back from inner experiences without reaction were found to be less likely to engage in anger rumination. Contrary to what was earlier predicted, however, participants who have a greater tendency to observe

and attend to sensations, perceptions, thoughts, and feelings were found to have a greater tendency to engage in anger rumination. A summary of the results are found in Table 4.

Table 4

Summary of Multiple Regression Analysis for Variables Predicting Anger Rumination (N = 123)

Variable	*B*	*SE B*	*β*
Observe	.44	.15	.23**
Act with Awareness	-0.20	.16	-0.10
Describing	-0.02	.14	-0.01
Non-Reactivity	-0.63	.22	-0.21**
Non-Judgment	-0.88	.14	-0.53***

Note. $R^2 = 0.47$; adjusted $R^2 = .45$
*$p < .05$ ** $p < .01$ ***$p < .001$

Third Research Question: Is the Relationship of Mindfulness with Depression Mediated by Depressive Rumination?

Step 1 of the Baron and Kenny procedure (1986) for testing mediation requires that the predictor, potential mediator, and predicted variable should be inter-correlated first. Table 5 shows that mindfulness, depressive rumination, and depression are, indeed, significantly correlated with each other. Participants who were more mindful were less likely to engage in depressive rumination and also tended to be less depressed. Likewise, higher levels of depressive rumination were associated with higher levels of depression.

Table 5

Correlations between Mindfulness, Depression, and Depressive Rumination (N = 123)

	1	2	3
1. Mindfulness	-	-.54***	-.38***

2. Depression	-.54***	-	.50***
3. Depressive Rumination	-.38***	.50***	-

*$p < .05$ ** $p < .01$ ***$p < .001$

Step 2 tests if the relationship between the potential mediator and the predicted variable remains significant while controlling for the predictor. Table 6 shows that the relationship between depressive rumination and depression does retain its statistical significance while controlling for mindfulness, $\beta = .35$, $t(121) = 4.54$, $p < .001$. Thus, depressive rumination can now be tested as a mediator of the relationship between mindfulness and depression.

Step 3 examines the relationship between the predictor and the predicted variable while controlling for the potential mediator. Table 6 indicates that when depressive rumination was controlled, mindfulness remained a significant predictor of depression, $\beta = -.40$, $t(121) = -5.24$, $p < .001$, albeit reduced from a correlation of -.54 to -.40. Thus, depressive rumination partially mediated the relationship between mindfulness and depression. A Sobel's test that was subsequently conducted was statistically significant ($z = -3.19$, $p < .01$), confirming the partial mediation.

Table 6

Summary of the Multiple Regression Analysis for Variables Predicting Depression (N = 123)

Variable	*B*	*SE B*	*B*
Depressive Rumination	.51	.11	.35***
Mindfulness	-.23	.05	-.40***

Note. $R^2 = 0.39$; adjusted $R^2 = .38$
*$p < .05$ ** $p < .01$ *** $p < .001$

Fourth Research Question: Is the Relationship of Mindfulness with Anger Mediated by Anger Rumination?

Table 7 shows that mindfulness, anger rumination, and anger are significantly inter-correlated fulfilling the first requirement of the Baron and Kenny test of mediation (1986). Participants who were more mindful were less likely to engage in anger rumination and also tended to be less angry. Likewise, higher levels of anger rumination were associated with higher levels of anger.

Table 7

Correlations between Mindfulness, Anger, and Anger Rumination (N=123)

	1	2	3
1. Mindfulness	-	-.35***	-.41***
2. Anger	-.35***	-	.57***
3. Anger Rumination	-.41***	.57***	-

Note. * $p < .05$ ** $p < .01$, ***$p < .001$

Step 2 examines the relationship between the potential mediator and the predicted variable while controlling for the predictor. Table 8 shows that the relationship between anger rumination and anger remains statistically significant while controlling for mindfulness, $\beta = .51$, $t(121) = 6.26$, $p < .001$. Step 3 examines the relationship between

the predictor and the predicted variable while controlling for the potential mediator. Table 8 indicates that when anger rumination was controlled, mindfulness no longer remained a significant predictor of depression, $\beta = -.14$, $t(121) = -1.70$, $p = .09$. Thus, anger rumination fully mediated the relationship between mindfulness and anger. A Sobel's test was subsequently conducted was statistically significant ($z = -3.89$, $p < .001$), confirming the full mediation.

Table 8

Summary of the Multiple Regression Analysis for Variables Predicting Anger (N = 123)

Variable	*B*	*SE B*	*B*
Anger Rumination	.31	.05	.51***
Mindfulness	-.06	.03	-.14

Note. $R^2 = 0.34$; adjusted $R^2 = .33$, *$p < .05$, ** $p < .01$, ***$p < .001$

Discussion

The purpose of the current study was to explore the relationship between trait mindfulness and rumination. Specifically, it investigated: 1) if mindfulness is associated with reduced levels of two types of rumination: depressive and anger rumination; 2) which of the five facets of mindfulness are most predictive of depressive and anger rumination; 3) whether the inverse relationship of mindfulness with depression is mediated by lower levels of depressive rumination; and 4) whether the inverse relationship of mindfulness with anger is mediated by lower levels of anger rumination.

The Relationship between Mindfulness and Rumination

The relationship between mindfulness and the two ruminative states (depressive and anger rumination) was predicted to be negative; that is, the more mindful an individual is, the less he/she ruminates. This prediction reflects the contrasting features of

mindfulness and rumination. The results of the current study do support this prediction. Individuals who are more mindful are less likely to obsessively reflect upon ideas or deliberate over choices. Instead they are likely to be grounded in the present moment, with a non-judgmental, non-reactive stance toward their environment. These findings are also consistent with the results of previous studies that have used mindfulness induction techniques (e.g., MBCT; Kingston et al., 2004, MBSR; Ramel et al., 2004) that led to reported reductions in rumination among participants through the span of mindfulness training courses.

The Five Facets of Mindfulness as Predictors of Levels of Depressive Rumination

To further explore the relationship between mindfulness and depressive rumination, the current study examined which of the five facets of mindfulness were most predictive of depressive rumination. Previous studies have not attempted to specify the roles that the specific elements of mindfulness play in reducing depressive rumination. It was predicted that each of the five facets would negatively correlate with depressive rumination. However, due to the exploratory nature of the study, no predictions were made about the relative importance or predictive value ranking of the facets.

Only 'non-judgment' was significantly predictive of depressive rumination. This finding suggests that participants are more likely to avoid depressive rumination if they take on a non-judgmental stance towards the self and their environment. Trapnell and Campbell (1999) describe rumination as a neurotic self focus; that is, a negatively biased, cycling judgments about personal flaws and distressing events. People typically try to rationalize flawed decisions in order not to compromise or hurt self-identity. If they fail

at a particular task, they have difficulty accepting it and attempt to find solutions through rumination to reclaim their self-worth.

In the ruminative cycle, one begins to reflect upon a decision, attempting to locate solutions to a prior depressive provocation. The repercussions of the event are inevitability present in the individual's environment, serving as a constant reminder of the depressing event. The individual then judges their initial reaction (or decision, or performance) as flawed, which provides a simple explanation for any subsequent failures that occur due to the initial event. For example, it is much easier for Jon to explain a failure in a course by the thought that he is an inadequate student. He has attempted to study (the one measure he believed would make him successful in the course), but did not have any success. With more failures on assignments, quizzes, projects, and exams, he has learned that there is little hope and he should not try any longer. He has given up because he understands that he is more likely to feel inadequate if he puts forth effort and fails, as opposed to someone who does not try and fails. By avoiding effort, he is avoiding the pain he initially experienced after being deemed a failure.

Both solutions have the same result, but the latter is an easier, less painful route. An individual who engages in this process is likely to judge themselves harshly with multiple failures. The more Jon failed with his tasks, the more he continued to berate himself for being inadequate. Given the results of the current study, it is likely that depressive rumination can be reduced significantly if one reduces the level of judgment towards the self and the external environment.

The Five Facets of Mindfulness as Predictors of Levels of Anger Rumination

As with depressive rumination, the relationship between mindfulness and anger rumination was further explored by conducting a multiple regression analysis to determine which of the five facets best predict lower levels of anger rumination. It was hypothesized that each of the five facets of mindfulness used would negatively correlate with anger rumination. Due to the exploratory nature of the study, no predictions were made about the relative importance of the facets.

Among the five facets tested, 'non-judgment,' 'non-reactivity,' and 'observation' were found to be significantly predictive of anger rumination. Confirming initial hypotheses, both 'non-judgment' and 'non-reactivity' were negatively correlated with anger rumination. Individuals who are less judgmental and reactive towards their thoughts and feelings are less likely to ruminate over anger experiences. The individual maintains a mindful attitude that encourages an open and accepting outlook toward the self and the world. There is a greater likelihood that they will accept internal sensations as organic reactions to events, which they allow to pass by through the consciousness. This open and accepting attitude of individuals counteracts the mechanisms of anger rumination.

'Observation' requires the individual to take an objective stance toward external stimuli, simply observing them as they pass by in the environment. Initial predictions specified a negative correlation between 'observation' and anger rumination; those who ruminate over anger provocations are likely to be those who are fixated on angry feelings. When they do not allow the stimulus to simply pass by, they are likely to fixate their attention on the situation until the problem is resolved. The results of the current study,

however, yielded a positive relationship with anger rumination. Participants who were more observant of internal sensations and their external environment were more likely to engage in anger rumination.

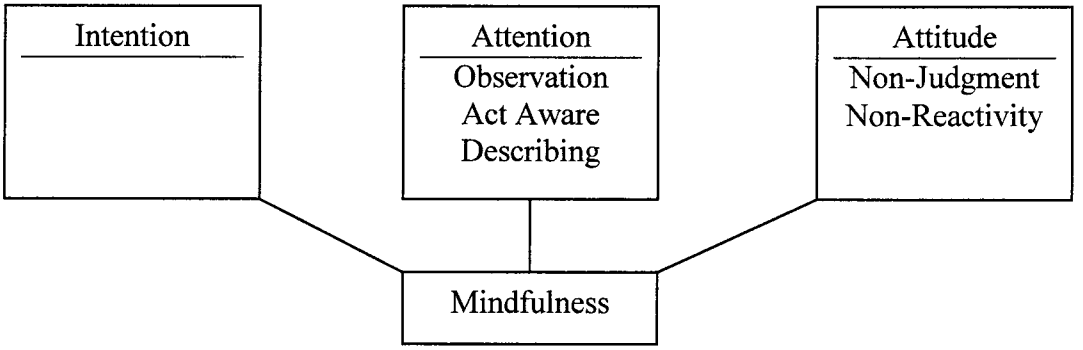
What explains this contradictory finding? It is possible that individuals may be using 'observation' in a maladaptive fashion. They may use 'observation' to provide more reasons for their failure. For example, Jon has continuously ruminated angrily about failing his exam. While sitting in class, he becomes even more frustrated as a nearly burnt out light flickers behind him. While that occurs, he hears water flush down a pipe above the classroom. "How the hell am I supposed to learn in this environment?!" Jon used a minor annoyance to explain his reason for failing the course. He throws his book down and storms out of the classroom to escape the perceived reasons for his failure. It is likely then that 'observation' can exacerbate anger rumination, supporting Brown and Ryan's (2003) position that high-levels of attention to the present moment can lead to greater mood disturbances and distress.

The Three Axioms of Mindfulness and Rumination

Given the results described above, which of the five facets of mindfulness then are better predictors of lowered levels of rumination? In the introduction section of this thesis, the three-axiom theory of mindfulness developed by Shapiro et al. (2006) was briefly discussed (see page 63 of this thesis) This theory conceptualized mindfulness as consisting of three axioms: intention, attention, and attitude. 'Intention' describes one's drive for practicing mindfulness that does not consist of any of the five facets. The second axiom, 'Attention' encompasses the harboring of the present moment. The third axiom of 'Attitude' refers to the way one interacts with internal and external provocations

as well as accepting the context without judgment. The five facets used in the study fall under 'attention' and 'attitude' (see Figure 3 below). 'Observation,' 'acting with awareness,' and 'describing' best comprise the axiom of attention, while 'non-judgment' and 'non-reactivity' best represent the axiom of attitude.

Figure 3. Axioms of Mindfulness



In the current study, 'non-judgment' was found to be a consistent predictor of both forms of rumination. 'Non-reactivity' was also found to be associated with diminished tendencies to ruminate over anger provocations. Given that these two facets constitute the axiom of 'attitude,' these findings indicate that the attitude axiom may be a more fundamental mechanism in the reduction of rumination than the axiom of 'attention.' When combined, the axioms of 'attention' and 'attitude' may target other symptoms, but given that rumination is a biased cycle of thought, such can be addressed by the attitude of the individual. If the attitude is negative (as in the negative valence of rumination), reactive, and judgmental, then the individual will likely ruminate over a particular event.

Depressive Rumination as a Mediator of the Relationship between Mindfulness and Depression

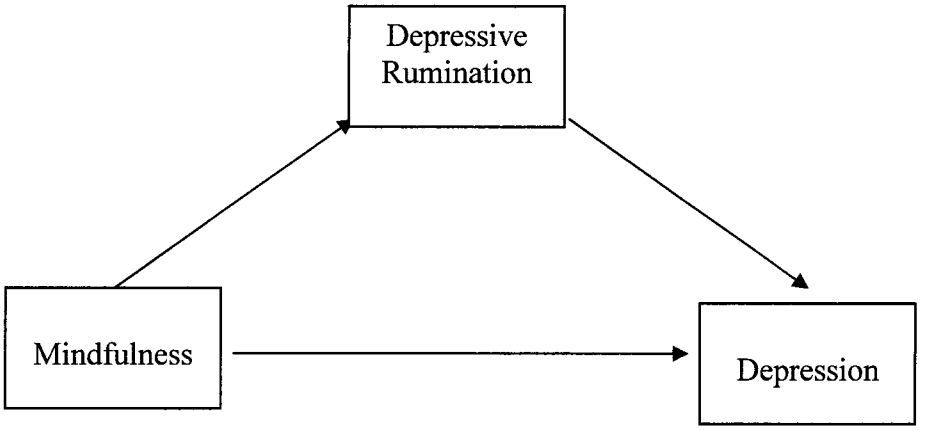
Given that individuals who are more mindful tend to engage less in depressive rumination, does this, in turn, make them less depressed? The present study predicted that depressive rumination will mediate the relationship between depression and mindfulness.

The tests of mediation indicate that individuals who were more mindful, were less likely to both depressively ruminate *and* be depressed while those who engaged in depressive rumination were more likely to experience symptoms of depression. The relationship between mindfulness and depression was found to be partially mediated by depressive rumination, indicating that individuals with higher levels of trait mindfulness were more likely to have lower levels of depressive rumination, and thus lower levels of depression (see Figure 4 below). Nonetheless, mindfulness was found to still hold a significant inverse relationship with depression when depression rumination was controlled. That is, decreases in depression can result from the reductions of depressive rumination brought about by mindfulness, as well as from mindfulness directly.

The partial mediation is likely due to mechanisms of mindfulness that reduce symptoms of depression other than depressive rumination. Depressive rumination is a distinct characteristic that is often associated with the onset of depression, but is not synonymous nor is it required to be present in those who are depressed (Nolen-Hoeksema, 2000). To test this explanation, a multiple regression analysis was conducted to examine which of the five facets of mindfulness was predictive of depression itself. While 'non-judgment' was predictive of depressive rumination as reported above, two

different facets of mindfulness ('describing' and 'non-reactivity) predicted symptoms of depression. These differences suggest that components of depression outside of depressive rumination are also reduced by increases in describing and decreases in reactivity towards thoughts and events. When considered together, it mindfulness acts as an agent in the reduction of depressive rumination as well as depressive symptoms.

Figure 4. Mindfulness and Depression as Mediated by Depressive Rumination



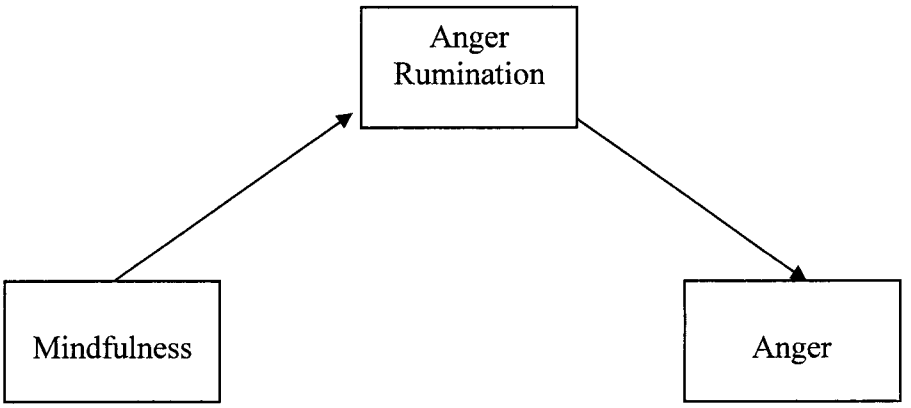
Anger Rumination as a Mediator of the Relationship between Mindfulness and Anger

The present study also tested if the relationship between mindfulness and anger was mediated by anger rumination. Given that individuals who are more mindful tend to engage less in anger rumination, does this, in turn, make them less angry? The tests of mediation indicated that individuals who were more mindful, were less likely to both ruminate over anger provocations *and* be angry while those who engaged in anger rumination were more likely to experience symptoms of anger. The relationship between mindfulness and anger rumination was found to be fully mediated, indicating that individuals with higher levels of trait mindfulness were more likely to have lower levels

of anger rumination, and thus lower levels of anger (see Figure 5 below). The mindfulness/anger relationship is dependent on reductions in anger rumination, suggesting anger rumination to be a key and essential feature of anger episodes.

The full mediation suggests that reductions in anger occur largely as mindfulness reduces anger rumination. This can be explained by the characteristics of anger. Anger and anger rumination are highly correlated, more so than the relationship between depression and depressive rumination, a relationship that was found to be partially mediated. The relationship may be due to an overlap in symptoms between anger rumination and anger. It appears that partial mediations (as observed in the depressive rumination mediation) occur due to distinct relationships of the predictors with the predicted variable, separate from the mediating variable. To test this explanation, a multiple regression analysis was conducted to examine which of the five facets of mindfulness was predictive of anger itself. 'Non-judgment' and 'non-reactivity' were found to be significantly predictive of anger. As reported earlier, both of these facets were significant predictors of reductions in anger rumination, suggesting a strong overlap between anger and anger rumination. The components of 'attitude' that reduce anger are likely targeting the anger rumination that overlaps anger, and not anger itself. Therefore it appears that the attitude components of mindfulness do not necessarily reduce anger, but the ruminative components that overlap with anger.

Figure 5. Mindfulness and Anger as Mediated by Anger Rumination



Therapeutic Implications.

Treatments that aim to reduce ruminative cycles might benefit from including mindfulness as a mechanism of change. To specifically target depressive and anger rumination, techniques that emphasize non-judgment and acceptance can be utilized to maximize the probability that rumination will diminish. The results of the current study support the effectiveness of mindfulness-based treatments such as MBCT or MBSR, which teach clients to reinterpret stimuli in order to defuse from a thought, thereby reducing reaction and judgment. This support extends to treatments that integrate mechanisms of mindfulness in treatment techniques such as ACT, which utilizes the specific components of 'non-judgment' and 'non-reactivity' to construct an open acceptance that is likely to target rumination at its core. Participants in this form of therapy learn to suspend judgment, which allows them to live in the present moment, refraining from ruminating over prior distress.

Although the current study does not implement a mindfulness induction procedure, the relationship implies that fostering 'non-judgment' and 'non-reactivity' will reduce ruminative tendencies. One can achieve similar results by forming a natural habit of approaching the environment non-judgmentally and without reaction. This can be done through mindfulness-based training, but once a mindful attitude is taught, it will likely continue to become part of the individual's disposition.

Limitations of the Study and Suggestions for Future Research

The current study has several limitations worth noting. The study tested hypotheses that were intended to add to the body of therapeutic literature, to determine what specific facets of mindfulness best predict lower levels of depressive and anger rumination, as well as to determine if mindfulness plays a direct or indirect role in alleviating depression and anger. The study was successful in addressing these questions but its findings are limited to mindfulness as a trait rather than a state. As a personality trait, mindfulness appears to be associated with reduced symptoms of rumination, but how will training that induces mindfulness itself affect rumination? A few prior studies testing the effectiveness of mindfulness interventions on rumination have reported similar effects (Kingston et al., 2004, Ramel et al., 2004, Jain et al., 2007), but have not attempted to explain how the various facets of mindfulness influence rumination. The current study provides initial hints about the relative contribution that each facet of mindfulness might play in reducing rumination. Future studies that induce mindfulness through a pre-post comparison paradigm can extend these results by testing each of these facets in isolation. For instance, an intervention that emphasizes the axioms of attention over attitude can be compared with one that focuses more on attitude than attention.

Another limitation of the current study is that the results are limited to the unique demographics of participants in the study (e.g., college students, ages 18-22, etc.). None of the individuals who participated in the study did exhibited clinical levels of anger and depression. In addition, rumination scores were found to be significantly below the midpoint. Future studies should aim to include individuals in the clinical population to determine if the current results are simply limited to a non-clinical population. It may likely be that greater levels of anger, depression, and rumination may elicit different results that may be appropriate to address in treatment.

Finally, the current study relied on self-report measures to assess levels of depressive and anger symptoms. The limitations of this mode of measurement are two-fold. First, self-reports may present different symptomology than observational ratings by a clinician. For example, question six on the Center for Epidemiological Studies Depression Scale asks the participant to rate how often over the past month they "have felt depressed." A student may not have a firm understanding of what depression is. They may interpret a lack of motivation as laziness rather than a symptom of depression. Symptom criteria for a major depressive episode suggest some symptoms may be observed by others. To remain consistent with clinical diagnosis, one may implement the use of observational measures to better identify symptomology. Similar criticisms can be raised concerning the measures used for the other variables in the current study.

Another limitation of self-report measures is biased responding by participants. Studies utilizing self-reports to ascertain socially stigmatized traits (e.g., mental illness) find that participants tend to respond in a socially favorable manner (for review see Fisher, 1993). Although the current study was anonymous and participants were given the

opportunity of participating on their personal computer, it is likely that socially desirable responding could have influenced the data. Future studies can include measures of social desirability such as the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) to examine the extent of this issue. However, the use of observational measures outlined above can examine behavioral symptoms that may address this limitation. Both options should be considered for future research that aims to replicate the current study.

Conclusion

Mindfulness is growing in western psychotherapy as a mechanism to promote psychological well-being. The ability to attend to the present moment with an open and accepting awareness has been the basis for several therapeutic treatments growing in prominence in clinical practice today. Much of the literature on the benefits of mindfulness have provided empirical support of the efficacy mindfulness interventions, but have yet to explore how the specific facets of mindfulness contribute to psychological symptoms. The present study explored the relationship of the five facets of mindfulness with rumination in order to understand the function of mindfulness at a micro level. It appears that mindfulness does in fact reduce rumination, but further exploration reveals 'non-judgment' as the primary catalyst for this change. Although the current results provide a potential solution to a minute pathological variable, these findings act as supplement to the present literature that will contribute to the evolution of mindfulness-based interventions.

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Appendices

Appendix A: Demographic Questionnaire

DEMOGRAPHIC INFORMATION

Please provide a response to the following questions.

1. Age: _____
2. Gender: Male or Female
3. Ethnicity:

   _____ White/Caucasian

   _____ Black/African-American

   _____ Hispanic

   _____ Native American

   _____ Asian American

   _____ Hawaiian or Pacific Islander

   _____ Multi-ethnic

   _____ Other

4. Year in School

   _____ Freshman

   _____ Sophomore

   _____ Junior

   _____ Senior

   _____ Graduate

5. Academic Major: _____

Appendix B: Five Facet Mindfulness Questionnaire

FIVE FACET MINDFULNESS QUESTIONNAIRE

Instructions: Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.

_____ 2. I'm good at finding words to describe my feelings.

_____ 3. I criticize myself for having irrational or inappropriate emotions.

_____ 4. I perceive my feelings and emotions without having to react to them.

_____ 5. When I do things, my mind wanders off and I'm easily distracted.

_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____ 7. I can easily put my beliefs, opinions, and expectations into words.

_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

_____ 9. I watch my feelings without getting lost in them.

_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.

_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

_____ 12. It's hard for me to find the words to describe what I'm thinking.

_____ 13. I am easily distracted.

_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.

_____ 16. I have trouble thinking of the right words to express how I feel about things.

_____ 17. I make judgments about whether my thoughts are good or bad.

_____ 18. I find it difficult to stay focused on what's happening in the present.

_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

_____ 21. In difficult situations, I can pause without immediately reacting.

_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.

_____ 24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 32. May natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 35. When I have distress thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.

Appendix C: Rumination Response Scale

Ruminative Responses Scale

Directions: People think and do many different things when they feel sad, blue, or depressed. I'm going to read a list of possibilities. Turn to the next scale in your book and please tell me if you never, sometimes, often, or always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

Almost Never	Sometimes	Often	Almost Always
1	2	3	4

1 Think about how alone you feel

2 Think "I won't be able to do my job if I don't snap out of this."

3 Think about your feelings of fatigue and achiness

4 Think about how hard it is to concentrate

5 Think "What am I doing to deserve this?"

6 Think about how passive and unmotivated you feel

7 Analyze recent events to try to understand why you are depressed

8 Think about how you don't seem to feel anything anymore

9 Think "Why can't I get going?"

10 Think "Why do I always react this way?"

11 Go away by yourself and think about why you feel this way

12 Write down what you are thinking and analyze it

13 Think about a recent situation, wishing it had gone better

14 Think "I won't be able to concentrate if I keep feeling this way."

15 Think "Why do I have problems other people don't have?"

16 Think "Why can't I handle things better?"

17 Think about how sad you feel

18 Think about all your shortcomings, failings, faults, mistakes

19 Think about how you don't feel up to doing anything

20 Analyze your personality to try to understand why you are depressed

21 Go someplace alone to think about your feelings

22 Think about how angry you are with yourself

Appendix D: Center of Epidemiological Studies – Depression

Center of Epidemiological Studies – Depression

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week: (circle **one** number on each line)

	During the past week...	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	All of the time (5-7 days)
1)	I was bothered by things that usually don't bother me.	0	1	2	3
2)	I did not feel like eating; my appetite was poor.	0	1	2	3
3)	I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4)	I felt I was just as good as other people.	0	1	2	3
5)	I had trouble keeping my mind on what I was doing.	0	1	2	3
6)	I felt depressed.	0	1	2	3
7)	I felt that everything I did was an effort.	0	1	2	3
8)	I felt hopeful about the future.	0	1	2	3
9)	I thought my life had been a failure.	0	1	2	3
10)	I felt fearful.	0	1	2	3
11)	My sleep was restless.	0	1	2	3
12)	I was happy.	0	1	2	3
13)	I talked less than usual.	0	1	2	3
14)	I felt lonely.	0	1	2	3
15)	People were unfriendly.	0	1	2	3
16)	I enjoyed life.	0	1	2	3
17)	I had crying spells.	0	1	2	3
18)	I felt sad.	0	1	2	3
19)	I felt that people dislike me.	0	1	2	3
20)	I could not get "going."	0	1	2	3

Appendix E: Anger Rumination Scale

Anger Rumination Scale (ARS)

Directions: Everyone gets angry and frustrated occasionally but people differ in the ways that they think about their episodes of anger. Statements below describe different ways that people may be recalling or thinking about their anger experiences. Please, read each statement and then respond by circling the appropriate number for each statement. There are no right or wrong answers in this questionnaire, and your honest responses that best describe yourself are very important. Please, respond to all items.

Almost Never	Sometimes	Often	Almost Always
1	2	3	4

1. I ruminate about my past anger experiences.

2. I ponder about the injustices that have been done to me.

3. I keep thinking about events that angered me for a long time.

4. I have long living fantasies of revenge after the conflict is over.

5. I think about certain events from a long time ago and they still make me angry.

6. I have difficulty forgiving people who have hurt me.

7. After an argument is over, I keep fighting with this person in my imagination.

8. Memories of being aggravated pop up into my mind before I fall asleep.

9. Whenever I experience anger, I keep thinking about it for a while.

10. I have times when I can not stop being preoccupied with a particular conflict.

11. I analyze events that make me angry.

12. I think about the reasons people treat me badly.

13. I have daydreams and fantasies of violent nature.

14. I feel angry about certain things in my life.

15. When someone makes me angry, I can't stop thinking about how to get back at this person.

16. When someone provokes me, I keep wondering why this should have happened to me.

17. Memories of even minor annoyances bother me for a while.

18. When something makes me angry, I turn this matter over and over again in my mind.

19. I re-enact the anger episode in my mind after it has happened.

Appendix F: Clinical Anger Scale

CAS

FEELINGS INVENTORY INSTRUCTIONS: The group of items below inquire about the types of feelings you have. Each of the 21 groups of items has four options.

For example, ITEM 99 ..... A. I feel fine.
B. I don't feel all that well.
C. I feel somewhat miserable.
D. I feel completely miserable.

For each cluster of items, read and identify the statement that best reflects how you feel. For example, you might choose A in the above example. If so, then you would darken in the letter (A) on the answer sheet next to the item number associated with that group of statements. In this example, that item number would have been "99."

Now go ahead and answer the questions on the answer sheet. Be sure to answer every question, even if you're not sure, and use a #2 pencil. Make sure you select only one statement from each of the 21 clusters of statements.

PLEASE BE HONEST IN RESPONDING TO THE STATEMENTS.

---

1. ..... A. I do not feel angry.
B. I feel angry.
C. I am angry most of the time now.
D. I am so angry and hostile all the time that I can't stand it.

2. ..... A. I am not particularly angry about my future.
B. When I think about my future, I feel angry.
C. I feel angry about what I have to look forward to.
D. I feel intensely angry about my future, since it cannot be improved.

3. ..... A. It makes me angry that I feel like such a failure.
B. It makes me angry that I have failed more than the average person.
C. As I look back on my life, I feel angry about my failures.
D. It makes me angry to feel like a complete failure as a person.

4. ..... A. I am not all that angry about things.
B. I am becoming more hostile about things than I used to be.
C. I am pretty angry about things these days.
D. I am angry and hostile about everything.

5. ..... A. I don't feel particularly hostile at others.
B. I feel hostile a good deal of the time.
C. I feel quite hostile most of the time.
D. I feel hostile all of the time.

6. ..... A. I don't feel that others are trying to annoy me.
B. At times I think people are trying to annoy me.
C. More people than usual are beginning to make me feel angry.
D. I feel that others are constantly and intentionally making me angry.

7. ..... A. I don't feel angry when I think about myself.
B. I feel more angry about myself these days than I used to.
C. I feel angry about myself a good deal of the time.
D. When I think about myself, I feel intense anger.

8. ..... A. I don't have angry feelings about others having screwed up my life.
B. It's beginning to make me angry that others are screwing up my life.
C. I feel angry that others prevent me from having a good life.
D. I am constantly angry because others have made my life totally miserable.

9. ..... A. I don't feel angry enough to hurt someone.
B. Sometimes I am so angry that I feel like hurting others, but I would not really do it.
C. My anger is so intense that I sometimes feel like hurting others.
D. I'm so angry that I would like to hurt someone.

10. .....A. I don't shout at people any more than usual.
B. I shout at others more now than I used to.
C. I shout at people all the time now.
D. I shout at others so often that sometimes I just can't stop.

11. .....A. Things are not more irritating to me now than usual.
B. I feel slightly more irritated now than usual.
C. I feel irritated a good deal of the time.
D. I'm irritated all the time now.

12. .....A. My anger does not interfere with my interest in other people.
B. My anger sometimes interferes with my interest in others.
C. I am becoming so angry that I don't want to be around others.
D. I'm so angry that I can't stand being around people.

13. .....A. I don't have any persistent angry feelings that influence my ability to make decisions.
B. My feelings of anger occasionally undermine my ability to make decisions.
C. I am angry to the extent that it interferes with my making good decisions.

D. I'm so angry that I can't make good decisions anymore.

14. .....A. I'm not so angry and hostile that others dislike me.
B. People sometimes dislike being around me since I become angry.
C. More often than not, people stay away from me because I'm so hostile and angry.
D. People don't like me anymore because I'm constantly angry all the time.

15. .....A. My feelings of anger do not interfere with my work.
B. From time to time my feelings of anger interfere with my work.
C. I feel so angry that it interferes with my capacity to work.
D. My feelings of anger prevent me from doing any work at all.

16. .....A. My anger does not interfere with my sleep.
B. Sometimes I don't sleep very well because I'm feeling angry.
C. My anger is so great that I stay awake 1—2 hours later than usual.
D. I am so intensely angry that I can't get much sleep during the night.

17. .....A. My anger does not make me feel anymore tired than usual.
B. My feelings of anger are beginning to tire me out.
C. My anger is intense enough that it makes me feel very tired.
D. My feelings of anger leave me too tired to do anything.

18. .....A. My appetite does not suffer because of my feelings of anger.
B. My feelings of anger are beginning to affect my appetite.
C. My feelings of anger leave me without much of an appetite.
D. My anger is so intense that it has taken away my appetite.

19. .....A. My feelings of anger don't interfere with my health.
B. My feelings of anger are beginning to interfere with my health.
C. My anger prevents me from devoting much time and attention to my health.
D. I'm so angry at everything these days that I pay no attention to my health and well-being.

20. .....A. My ability to think clearly is unaffected by my feelings of anger.
B. Sometimes my feelings of anger prevent me from thinking in a clear-headed way.
C. My anger makes it hard for me to think of anything else.
D. I'm so intensely angry and hostile that it completely interferes with my thinking.

21. .....A. I don't feel so angry that it interferes with my interest in sex.
B. My feelings of anger leave me less interested in sex than I used to be.
C. My current feelings of anger undermine my interest in sex.
D. I'm so angry about my life that I've completely lost interest in sex.