The Effects of a Mindfulness-Based Intervention on Feelings of Loneliness and Ruminative Thinking

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The Effects of a Mindfulness-based Intervention on Loneliness and Ruminative Thinking

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A thesis submitted to the Department of Psychology of The College at Brockport, State University of New York, in partial fulfillment of the requirements for the degree of Master of Arts

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Abstract

Loneliness is a very distressing experience provoked by perceived deficiencies in interpersonal social contact. In recent years, considerable attention has been oriented towards the transformative changes associated with the practice of mindfulness. Thus, many mindfulness-based interventions have emerged and demonstrated efficacy for ameliorating various forms of psychological distress. However, few studies have examined whether the therapeutic benefits are applicable for alleviating loneliness. Prior research has suggested that the mechanisms of change underlying mindfulness may occur via reductions in rumination, which has been implicated in prolonged feelings of loneliness. The present study concerns the effects of a randomized-controlled trial of Unstress II, a mindfulness-based group intervention on self-reported changes in mindfulness, rumination, and loneliness. Participants (N=82) were randomly assigned to either a treatment or wait-list control group, all of which were assessed at two time periods, pre-intervention and post-intervention. The results revealed that participants in the treatment groups reported significant increases in mindfulness in addition to reductions in rumination and loneliness from pre- to post-intervention in comparison to those in the wait-list control groups. The effect of the intervention on loneliness remained significant even after statistically controlling for self-reported depressive symptoms. The relationship between mindfulness and loneliness was partially mediated by rumination at both assessment times. Furthermore, the effect of the intervention on corresponding reductions in rumination was fully mediated by changes in mindfulness at the post-intervention follow-up. The limitations of the study and implications for future research are discussed in conjunction with the observed findings.

Keywords: mindfulness, meditation, rumination, loneliness, psychological distress, intervention
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The Effects of a Mindfulness-based Intervention on feelings of Loneliness and Ruminative Thinking

Introduction

Loneliness

Loneliness is an unpleasant response to the perception of isolation or lack of social connection with others. Approximately 20% of adults in the United States experience frequent and debilitating loneliness at any given point in time (Cacioppo & Patrick, 2008). An accumulation of empirical studies has linked loneliness to broad-based health issues related to both physical and mental health (Cacioppo, Cacioppo, & Boomsma, 2014; Cacioppo & Patrick, 2008). Before proceeding further, loneliness must be distinguished from solitude and isolation. The term isolation represents an objective indicator of low social contact. Moreover, solitude is a state of isolation often involving the personal satisfaction of being alone. Conversely, loneliness is conceptualized as the pain of feeling alone (Cacioppo et al., 2000; Cacioppo, Hawkley, & Thisted, 2010; Tillich, 1959). Based on this understanding, it is quite possible for an individual to live a life of solitude, in isolation from the social world but not experience loneliness whereas; another individual might feel lonely despite being surrounded by others. Therefore, the experience of loneliness is highly subjective in nature.

Theoretical Frameworks. In order to better understand the etiology and maintenance of loneliness, it is important to consider the emotional experience through the lens of different theoretical models and empirical studies. Despite its enduring presence across multiple domains, loneliness was often left unaddressed by researchers and clinicians. Frieda Fromm-Reichmann (1959) was among the first to explore the topic and suggested that the dearth of evidence in scientific literature stemmed from the complex nature of loneliness and its potential insult to psychological health and well-being (Fromm-Reichmann, 1959; Peplau & Perlman, 1982). Since
then, several different theoretical frameworks have emerged that provide conceptual bases for loneliness and the long-term consequences associated with the experience.

**Weiss’ Typology.** Robert Weiss (1973) characterized loneliness as a “gnawing, chronic disease, without any redeeming features” (p. 15). Weiss (1973, 1974) proposed a typology of loneliness that posits that deficiencies in social relationships give rise to feelings of loneliness. He further postulated that it is not the lack of social relationships per se that leads to loneliness but rather the absence of specific social provisions. Weiss (1974) postulated that there are six distinct social provisions necessary for psychosocial adjustment, each of which can be obtained from different types of relationships: attachment, social integration, opportunity for nurturance, reassurance of worth, reliable alliance, and guidance. *Attachment* is provided by close relationships that provide a sense of security and validation such as marriages, committed long-term relationships, and communication between members within a family system. *Social integration* occurs through interactions within one’s immediate social network that provide opportunities for social engagement and in turn enables an individual to seek companionship with those who share similar goals and values. Social integration is tantamount to Portes’ (1998) idea of social capital, whereby individuals are able to utilize and secure the benefits of membership within any given social network (Nicholson, Brown, & Hoye, 2013). *The opportunity for nurturance* pertains to the extent of an individual’s reliance on others for the maintenance of his or her own well-being, respectively. Moreover, this provision is often evident within the parent-child dyad. *A reassurance of worth* occurs in relationships by which a person’s competence in a specific social role is validated and affirmed. This provision might be provided by a position within a professional organization whereby one’s potential contributions are recognized and valued. *Reliable alliance* concerns the overall trust and dependency in others for
support. Weiss (1974) suggested that this provision is provided by the family system and may be exhibited in part by the interdependence among family members that foster a sense of help and assistance. Finally, guidance pertains to the presence of a close and trusting confidant who can provide advice and emotional support during times of need.

Since different social relationships may be suited for one specific provision over another, it is not possible to satisfy all of the provisions at once solely from a single relationship (DiTommaso & Spinner, 1997). Weiss (1974) argued that all the social provisions are garnered by an indefinite number of relationships and these relationships in turn, must continue to satisfy each provision across the lifespan. The absence of any of these provisions can potentially give rise to two distinct forms of loneliness: social loneliness and emotional loneliness. Social loneliness stems from the perceived absence of a satisfying social network and is likely to give rise to feelings of marginality, boredom, depression, aimlessness, and an overall sense of meaninglessness in an individual’s life (Cutrona, Russell, Rose, & Yarko, 1984; DiTommaso & Spinner, 1997; Weiss, 1974). Furthermore, Weiss (1974) believed that social loneliness acts as an intrinsic drive that compels an individual to seek out social affiliation. Conversely, emotional loneliness results from a perceived lack of intimacy or close attachment with another individual and fosters accompanying feelings of abandonment, emptiness, and anxiety (Cutrona, Russell, & Rose, 1984; DiTommaso & Spinner, 1997). Weiss (1974) speculated that individuals suffering from emotional loneliness would be more likely to exhibit hypervigilance and heightened sensitivity to minimal social cues aimed at establishing connections with others. Both forms of loneliness are believed to motivate an individual to satisfy any missing or otherwise deficient provisions. The consequences of leaving these provisions unsatisfied is thought to give rise to
loneliness in addition to cognitive impairments, sleep disruptions, emotional dysregulation, apathy, and an overall sense of personal dissatisfaction with life (DiTommaso & Spinner, 1997).

**Existentialism.** The existential perspective emphasizes the notion of aloneness in the sense that an individual enters the world upon birth alone, progresses through life alone, and inevitably experiences death alone (Langle & Probst; 2004; McGraw, 1995; Moustakas, 1961; Sand & Strang, 2006; Yalom, 1980). By accepting this reality, it is believed that an individual will be able to live a more authentic life enriched with meaning and purpose. Moustakas (1961) described this realization as *existential loneliness*, an integral component of the human condition whereby an individual acknowledges himself or herself as an isolated being separate from others and free to create a life worth living. However, the inability to acknowledge this existential loneliness can consequently result in *loneliness anxiety*, which is described as an overall sense of detachment from the self and the surrounding environment (Moustakas, 1961, Sand & Strang, 2006). According to Moustakas (1961), loneliness anxiety occurs “because man has lost a sense of oneness with others and with nature…” (pp. 24).

Loneliness anxiety is believed to be more pronounced in industrialized nations and individualistic cultures marked by autonomy and self-reliance (Sønderby & Wagoner, 2013). Moustakas (1961) found in interview based research that this type of loneliness was associated with subjective feelings such as emptiness and a sense of isolation from society. Similarly, Langle and Probst (2004) found that elderly individuals reported experiencing loneliness anxiety when faced with the existential awareness of their approaching death and gradual parting from loved ones. In the context of loneliness anxiety, an individual lacks a sense of relatedness and a genuine set of values that in turn prevent him or her from living a more authentic life (Moustakas, 1961; Sonderby & Wagoner, 2013). In an attempt to avoid the anxiety of loneliness,
one may resort to superficial social encounters as a means of seeking validation. However, such attempts are often deemed futile as an individual must be able to accept the reality of his or her existential loneliness, but also accept that self-validation originates from within not from others (McGraw, 1995; Yalom, 1980).

**Attachment.** The attachment theory, originally proposed by Bowlby (1969) is based on the premise that during the period of infancy, children form attachment bonds with primary caregivers in order to derive a sense of warmth, intimacy, and security. An important tenet of the theory is that an infant must be able to form a secure attachment to at least one caregiver in order to experience a healthy social and emotional development (Bogaerts, Vanheule, & Desmet, 2006). Furthermore, the theory posits that the early attachment experiences with primary caregivers, most notably the mother, give rise to the formation of close and intimate relationships later in life.

The absence of an attachment figure is expected to yield separation anxiety and feelings of discomfort. Moreover, the separation anxiety is believed to motivate an infant to seek comfort in a primary caregiver whenever he or she feels threatened (Bowlby, 1973). Bowlby (1969) argued that the tendency for an infant to bond with primary caregivers early in life resulted from selective evolutionary pressures as this type of behavior was adaptive in the sense that it would promote the infant’s survival in the face of threatening circumstances. Furthermore, he believed that loneliness was indicative of the breakdown of bonds with primary caregivers early in life (Bowlby, 1973). This notion is supported by contemporary research suggesting that adults who experience a stable childhood, on average experience less loneliness and derive more satisfaction from interpersonal relationships compared to those whose childhood was more traumatic (Hojat, 1989; 1998).
Attachment theory also emphasizes the role of working models, which are based predominantly on early attachment experiences that provide mental representations of the self, others, and the social environment. These working models are believed to influence the way an individual bonds with other people later in life by establishing personal expectations with regard to attachment figures and self-efficacy (Bogaerts, Vanheule, & Desmet, 2006). The personal expectations provide a personal standard about the quality of relationships and affect the level of intimacy established as well as the extent to which loneliness is experienced (Buss, 1999; Bogaerts, 2006; Goossens, Marcoen, Van Hees, & Van de Woestijne, 1998). People with an insecure attachment to primary caregivers tend to be more lonely and are more likely to have experienced prolonged episodes of separation anxiety marked by absence, emotional unavailability, and rejection or abandonment (Kobak & Madsen, 2008).

Research on working models of adult attachment to peers has suggested that insecure representations of parental attachment significantly predict loneliness (Man & Hamid, 1998; Ross & Burgess, 2003). For instance, Bogaerts et al. (2006) identified a linear causal relationship between parental attachment and feelings of loneliness suggesting that child-parent relationships remain important across the lifespan. However, no relationship was found between parental attachment in childhood and feelings of loneliness in young adulthood indicating that a positive relationship with parents during the first years of life does not buffer against experiencing loneliness later in life. Furthermore, early attachment experiences may not fully account for chronic feelings of loneliness, which are believed to represent a conglomerate of factors.

Evolutionary. Social connection is believed to have conferred an evolutionary survival advantage. Ancient ancestral groups were more likely than individuals to have relied on communication with others in order to coordinate hunting and gathering, share food, and build
shelters that in turn would ostensibly provide protection from threat. Moreover, group membership would have provided more opportunities for mate selection as well as assistance with raising children. Therefore, those who were inclined to bond with group members were more likely to survive than those who lived a life of isolation (Cacioppo & Hawkley, 2003; Cacioppo & Patrick, 2008). Furthermore, those who were more inclined to establish intimacy with group members had an advantage in terms of reproductive success.

Loneliness may have developed in response to isolation in order to protect human beings from potential harm or danger. Cacioppo and Patrick (2008) argued that loneliness evolved as an internal mechanism that punishes social deprivation and rewards social connection. Furthermore, the authors suggested that loneliness could be perceived as a form of social pain. Interestingly recent research, has suggested that loneliness shares some of the underlying mechanisms responsible for physical pain (Cacioppo, Cacioppo, & Boomsma, 2014; Cacioppo & Patrick, 2008; Eisenberger et al., 2003; Rilling et al., 2002). Eisenberger et al. (2003) revealed neural activation in the dorsal section of the anterior cingulate cortex (ACC) in response to social rejection, a brain region that also activates in response to the perception of physical pain (Rainville, Duncan, Price, Carrier, & Bushnell, 1997). This suggests that social pain may share neural substrates with physical pain due to the protective mechanism of social connection towards survival.

There are also believed to be variations in the extent to which people experience loneliness. The experience is associated with both state and trait like properties. As a state, loneliness can manifest as temporary behaviors or feelings in response to a specific situation or circumstance such as the dissolution of a relationship or entering a new environment (Cacioppo, Cacioppo, & Boomsma, 2014; Cacioppo & Hawkley, 2009; Cacioppo, Hawkley, Norman, &
Bernston, 2011). Conversely, loneliness as a *trait* is indicative of chronic feelings of loneliness that remains stable over time and this aspect may be in part, attributed to heritability. For instance, adoption and twin studies indicate that heritability accounts for approximately 50% of the individual differences in loneliness in children and 48% in adults (Boomsma, Willemsen, Dolan, Hawkley, & Cacioppo, 2005; Bartels, Cacioppo, Hudziak, & Boomsma, 2008; McGuire & Clifford, 2000). However, it is unlikely that the heritability of loneliness is associated with a single gene. Instead, the heritability may be the by-product of a conglomerate of genes that enhance sensitivity to social disconnection or overlap with the genetic contributions to traits such as negative emotionality and social withdrawal (Ernst & Cacioppo, 1999; McGuire & Clifford, 2000).

Under difficult circumstances, a genetic predisposition to experience loneliness may have motivated an individual to maintain social bonds in order to diminish feelings of discomfort, while simultaneously discouraging selfish behavior (Cacioppo, Cacioppo, & Boomsma, 2014). While this may have been beneficial within archaic time periods, chronic loneliness in modern society is often considered maladaptive and even pathological. Studies using the evolutionary model have indicated that individuals who experience chronic feelings of loneliness consequently exhibit hypervigilance, extreme sensitivity to rejection, and social withdrawal (Cacioppo & Hawkley, 2005; Cacioppo, Hawkley, & Thisted, 2010; Cacioppo, Norris, Decety, Monteleone, & Nusbaum, 2008). According to Cacioppo and Patrick (2008), lonely individuals are more likely to behave in ways that promote social exclusion from others thereby, increasing and prolonging the experience.

*Cognitive Discrepancy.* The cognitive discrepancy model, originally proposed by Peplau & Perlman (1982), posits that loneliness occurs when there is a perceived discrepancy between
actual and desired levels of social interaction. The definition provided by the model has been used as the basis for many empirical studies examining loneliness. The model suggests that feelings of loneliness arise when an individual recognizes a deficiency in either the quantity or quality of interpersonal relationships (Heinrich & Gullone, 2006; Peplau & Perlman, 1982). Based on this understanding, lonely individuals may lack supportive social ties or possess unusually high standards for the types of social relationships that they desire.

The model emphasizes both a cognitive and affective component of loneliness (Heinrich & Gullone, 2006). The cognitive aspect serves to alert an individual that his or her relationships are inadequate in some respect. Conversely, the affective component serves to prompt the cognitive re-evaluation of social situations in order to promote behavioral modifications aimed at alleviating any distress associated with loneliness. This component has been conceptualized as the internal emotional response to the cognitive perception of loneliness and may manifest through emotional states such as anxiety, depression, and hostility (Cacioppo & Hawkley, 2009; Cacioppo & Patrick, 2008;). The ways in which loneliness influences the interaction of both cognitive thought processes and emotion are believed to impact both the frequency and duration of the experience.

**Loneliness and Depression**

Loneliness appears to be closely aligned with other psychological constructs, most notably depression. Indeed, both experiences tend to occur simultaneously and individuals formally diagnosed with major depressive disorder tend to score higher on measures of loneliness in comparison to nondepressed individuals, respectively (Haggerty & Williams, 1999). Research has consistently yielded positive correlations between measures of both constructs with coefficients ranging from $r = .40$ to $r = .60$, which have remained remarkably
stable despite controlling for the variance imposed by age, gender, and ethnicity (Anderson & Arnoult, 1985; Dill & Anderson, 1999; Haggerty & Williams, 1999; Heinrich & Gullone, 2006; Nolen-Hoeksema & Ahrens, 2002; Weeks, Michela, Peplau, & Bragg, 1980). The substantial correlations observed across many studies have compelled some to conceptualize loneliness as a subset or by-product of depression rather than a distinct psychological construct (Mushtaq, Shoib, Shah, & Mushtaq, 2014; Weeks et al., 1980).

Despite moderate to strong positive correlations between depression and loneliness, loneliness is distinguishable from that of depression both phenomenologically and statistically. Some have emphasized that the experience of loneliness is predominantly centered on interpersonal social relationships and failure to establish close and intimate connections with others while depression stems from a variety of individual and situational factors (Baumeister & Leary, 1994; Heinrich & Gullone, 2006). Weiss (1973) asserted that, “In loneliness there is a drive to rid oneself of one’s distress by integrating into a new relationship; in depression there is instead a surrender to it” (p.15).

Statistically, Weeks, Michela, Peplau, and Bragg (1980) used a combination of longitudinal design and structural equation methodology in order to further distinguish loneliness from depression. Self-report measures of both constructs were administered to a sample of undergraduate students twice across a 5-week interval. The results indicated that half of the variance observed in loneliness failed to be accounted for by depression and vice-versa. The structural equation models revealed no cross-factor paths between both variables, suggesting that loneliness did not cause depression and depression did not cause loneliness. The overall results led the authors to conclude that loneliness and depression are likely to represent two inter-
related, yet distinct psychological constructs that share common causal origins (Weeks et al., 1980).

In order to demonstrate the potential to empirically measure loneliness and emphasize its distinction from conceptually similar constructs such as depression, Russell et al. (1980) administered the revised UCLA Loneliness Scale (R-UCLA) to participants across two separate studies. Upon establishing the concurrent validity of the scale in the first study, the authors then addressed the discriminant validity by examining the relationship between loneliness scale scores and measures of various mood and personality constructs, specifically depression, anxiety, self-esteem, introversion-extroversion, affiliative tendency, assertiveness, sensitivity to rejection, social desirability, and lying. A separate self-labeling loneliness index consisting of six-items that explicitly addressed the experience was examined alongside each of the measures. The authors performed four separate tests of discriminant validity. A set of bivariate correlations was first conducted in order to measure the relationship between the loneliness scale and each of the variables in addition to the self-labeling loneliness index. The analyses revealed that the correlation between scores on the R-UCLA and the loneliness index was the highest in comparison to the mood and personality variables. However, strong correlations between loneliness and several of the other variables were evident, albeit the magnitude was not as high as what was observed with the scores relationship with the loneliness index (Russell et al., 1980).

The second analysis involved a series of multiple regression analyses, which combined all the mood and personality variables as predictors of loneliness. A factor analysis was subsequently conducted and items on each of the measures were loaded onto four distinct factors: 1) social risk taking, 2) negative affect, 3) social desirability, and 4) affiliative motivation. When combined, these four factors accounted for 43% of the variance associated
with the R-UCLA scores, neglecting over 50% of the remaining variance (Russell et al., 1980). For the third phase of the analysis, a hierarchical regression analysis was performed in order to examine the extent to which the residual variance was attributed to the self-labeling loneliness index. The findings revealed that the self-labeling loneliness index was a significant predictor of loneliness after controlling for the variance explained by the mood and personality factors.

Furthermore, the index was found to account for an additional 18% of the remaining variance in R-UCLA scores. The fourth and final analyses for assessing the discriminant validity of the loneliness measure involved the use of partial correlations in order to statistically control for the influence of mood and personality variables on the previously established concurrent validity, which was demonstrated by the significant relationship between loneliness and social behaviors. The results revealed significant relationships between the loneliness scale scores and overall time spent alone as well as the quantity of close friends. A further analysis of covariance revealed a significant association between loneliness and relationship status. Taken together, the overall findings from the study indicate that loneliness is distinguishable from that of depression and other theoretically linked psychological constructs. The results also support the discriminant validity of the R-UCLA for examining the ubiquitous and devastating experience of loneliness.

**Loneliness Across the Lifespan.** Loneliness is a universal experience that is impervious to any boundaries imposed by age, race, sexual orientation, marital status, socioeconomic status, and health status (Heinrich & Gullone, 2006). A vast array of research has revealed the prevalence of loneliness across the lifespan of human development. The experience seems to occur more frequently during earlier developmental stages in comparison to old age (Heinrich & Gullone, 2006; Peplau, Bikson, Rook, & Goodchilds, 1982; Peplau & Perlman, 1982). For instance, Parlee (1979) found that approximately 79% of participants under the age of 18
reported feeling lonely sometimes or often in comparison to 71% of 18- to 24- year olds, 69% of
25- to 34-year-olds, 60% in the age range of 35 to 44, 53% of those within the ages of 45 to 54,
and 37% over the age of 55. Based on longitudinal and large-scale studies, loneliness is believed
to be persistent and painful for at least 10 to 20% of adolescents (Brennan, 1982; Heinrich &
Gullone, 2006).

Higher levels of loneliness have been observed in high school students and the
experience has been found to be quite ubiquitous during the initial transition to college (Culp,
Clyman, & Culp, 1995; Cutrona, 1982; Heinrich & Gullone, 2006; Shaver, Furman, &
Buhrmester, 1985; Schultz & Moore, 1988). Furthermore, surveys have shown that those who
are single tend to report feeling lonelier than those involved in committed relationships while
people who are widowed, divorced, or separated, tend to be lonelier than those who have never
been married (Peplau & Perlman, 1982). Upon reviewing average loneliness scores across a wide
range of samples, Perlman and Landolt (1999) concluded that loneliness is likely to rise during
early childhood, peak during adolescence, progressively decline during young adulthood and
middle age, and slightly increase during old age, especially in the presence of health
complications that impose constraints on social activity.

The Quantitative and Qualitative Characteristics of Loneliness. Loneliness varies
considerably and the experience has been examined both quantitatively and qualitatively across
different age groups. The quantitative aspect of loneliness is based on the observable and
objective characteristics of social relationships such as the frequency of social contact or the
overall size of an individual’s social network, whereas the qualitative aspect represents the
subjective appraisal of these relationships such as perceived satisfaction, intimacy, and
acceptance (Heinrich & Gullone, 2006; Peplau & Perlman, 1982).
There has been considerable debate in the empirical literature regarding the extent to which either the quantitative or qualitative characteristics better predict the severity of loneliness. Parker and Seal (1996) found that measuring loneliness in children on the basis of objective indicators has only been able to reveal higher levels of loneliness in children without any friends in comparison to those with at least one friend. However, no differences have been found between children with one friend and those with many friends. Furthermore, additional research has found that the overall level of social contact is independent from loneliness (Heinrich & Gullone, 2006; Jones, 1982; Wheeler et al., 1983). Jones (1981) argued that objective measures fail to capture the underlying nature of both social relationships and behavior. In line with this notion, Cutrona (1982) found that measuring loneliness qualitatively through subjective satisfaction indexes better predicted loneliness in comparison to objective indicators such as frequency of contact. In a longitudinal study, Carmichael, Reis, and Duberstein (2015) found that both the quantity and quality of social activity influence feelings of loneliness later in life. The authors found that the quantity of social activity at age 20 and the quality of social interactions at age 30 significantly predicted loneliness, depression, and psychological well-being at age 50. Therefore, the extent to which one component influences loneliness may depend on both the developmental period and the goals for social interactions.

**Coping with Loneliness.** Rokach (1998) postulated that there are six distinct stages an individual progresses through while experiencing loneliness: 1) pain and awareness; 2) denial; 3) alarm and realization; 4) searching for causes and self-doubt; 5) acceptance; and 6) coping. The extent to which an individual is able to recover from the distress associated with loneliness depends in part on the efficacy of his or her coping mechanisms. Many individuals who experience loneliness are more likely to turn to religious or spiritual practices for comfort.
Some studies have found that many lonely individuals attempt to distract themselves by engaging in solitary activities such as watching television, reading, or exercising (Heinrich & Gullone, 2006; Peplau & Perlman, 1982; Rook & Peplau, 1982). Others might find ways to compensate for deficiencies in social relationships by focusing efforts to improve other facets of life such as education or careers (Rook & Peplau, 1982). Nonetheless, lonely individuals may still attempt to forge social relationships by taking more initiative to interact with others or improve their social capital such as personal appearance (Peplau & Perlman, 1982; Rook & Peplau, 1982). Unfortunately, for many, loneliness can prove to be persistent, enduring, and overwhelming resulting in prolonged distress that increases the risk for health issues over time.

**Loneliness and Physical Health.** Chronic loneliness has been long believed to serve as a risk factor for broad-based morbidity and mortality. Indeed, lonely individuals have an estimated 45% lower life expectancy than those who are socially embedded. This relationship remains when controlling for other health-related risk factors such as cardiovascular disease and cancer (Cacioppo & Hawkley, 2009; Jaremka et al., 2012). Furthermore, the long-term health effects of loneliness are believed to be more insidious than obesity and smoking (Cacioppo & Patrick, 2008). Lonely individuals have reported experiencing migraines, nausea, fatigue, and eating disturbances (Page & Cole, 1991). Empirical evidence has also linked loneliness to health issues such as Type II diabetes, hypertension, pulmonary diseases, cancer, and neurodegenerative diseases (Cacioppo, Cacioppo, & Boomsma, 2014; Cacioppo & Hawkley, 2003; Cacioppo & Patrick, 2008; Cacioppo & Hawkley, 2009; Coyle & Dugan, 2012; Jaremka et al., 2014).

Loneliness is believed to compromise the neural, hormonal, and cellular biological mechanisms responsible for maintaining physical health. According to Hawkley and Cacioppo
(2002), the adverse health effects of loneliness manifest over a prolonged period of time through three putative pre-disease pathways: health behaviors, excessive stress reactivity, and inadequate repair and maintenance processes. Each of these pathways contributes to the physiological effects of loneliness.

**Health Behaviors.** Lonely individuals tend to lack supportive social ties and as such are more likely to neglect their physical health. Moreover, the effects of loneliness have been associated with fewer health promoting behaviors such as less exercise and poor nutrition as well as more health compromising behaviors such as alcohol and substance abuse (Heinrich & Gullone, 2006). For instance, Fulmer and Lapidus (1980) found that loneliness was among the professed reasons for addicts’ continued use of heroin and the experience served as a significant predictor of relapse upon prolonged abstinence. The experience is also potentially expensive for both an individual and society at large as lonely individuals are likely to make greater use of the health care system in comparison to nonlonely individuals. For instance, elevated levels of loneliness in hospital patients have been found to predict significantly more emergency room visits independent of health factors such as chronic ailments and diseases (Geller, Janson, McGovern, & Valdini, 1999; Heinrich & Gullone, 2006).

**Excessive Stress Reactivity.** Research has suggested that loneliness is associated with heightened stress reactivity. Cacioppo et al. (2000) found that lonely individuals appraised significantly more events as being stressful when compared to nonlonely individuals. Furthermore, blood samples of college students revealed elevated levels of cortisol in those who scored high on self-report measures of loneliness. Cacioppo and colleagues also identified differences between lonely and nonlonely individuals in cardiovascular functioning with the former exhibiting greater peripheral resistance and lower cardiovascular output at rest (Cacioppo
et al., 2000; Cacioppo et al., 2002; Cacioppo & Patrick, 2008; Hawkley & Cacioppo, 2003). Based on the evidence, the authors contended that the effects of chronic loneliness might manifest via prolonged activation of the hypothalamic-pituitary-adrenal (HPA) axis, a biological pathway that releases cortisol in response to stressful events.

**Impaired Repair and Maintenance Processes.** Prolonged activation of the HPA axis can potentially raise blood pressure and suppress cellular immunity, adversely affecting the body’s ability to recover from infections (Cacioppo et al., 2000; Cacioppo & Patrick, 2008). In line with this notion, Pressman et al. (2005) found that higher levels of loneliness were associated with reduced responsiveness to the influenza vaccine in college students. Loneliness has also been found to undermine the restorative properties of sleep. Based on both subjective and objective measures of sleep quality, Cacioppo et al. (2000) observed that lonely individuals took significantly longer to fall asleep and reported significantly more sleep disruptions in comparison those who reported lower levels of loneliness. Other studies have linked loneliness to delayed recovery from physical pain and accelerated progression from HIV to AIDS in lonely individuals (Cacioppo et al., 2002; Cacioppo, Hawkley, Norman, & Bernston, 2011; Cole, Kemeny, Taylor, Visscher, & Fahey, 1996; Jaremka et al., 2014).

**Loneliness and Mental Health.** Loneliness raises concerns for mental health and has been linked to clinical issues such as poor personality integration and various forms of psychopathology such as social anxiety disorder, major depressive disorder, and schizophrenia (Deniro, 1995; Goswick & Jones, 1981; Heinrich & Gullone, 2006; Overholser, 1992). However, loneliness in and of itself has the potential to result in impairments across a broad range of important functional and social domains. Therefore, it is important to address the pathological pattern of thoughts, feelings, and behaviors that underlying the experience of loneliness.
**Behavioral Features.** Lonely individuals are believed to be more likely to exhibit poor emotional self-regulation and have been shown to score significantly higher on measures of hostile behavior when compared to nonlonely counterparts, respectively (Cacioppo & Patrick, 2008; Ernst & Cacioppo, 1999; Heinrich & Gullone, 2006). Studies have also revealed social skills deficits in lonely individuals marked by difficulties with behavior in social settings such as maintaining a friendly demeanor and participating in events with large groups of people (Horowitz & French, 1979). In coping with loneliness, Rubenstein and Shaver (1982) found that individuals who frequently felt lonely were more likely to cope with distress through solitary activities such as watching television and less likely to engage in social interactions. Similarly, Cacioppo et al. (2000) found that loneliness in college students was associated with reduced efforts to manage daily stressors and less active coping strategies to deal with stressful events. Furthermore, it is believed that lonely individuals are less likely to utilize mental health resources such as counseling and psychotherapy (Heinrich & Gullone, 2006). Perhaps among the more concerning behavioral aspects is the relationship between loneliness and suicide. Research has identified loneliness as a contributing factor to both suicidal and parasuicidal behaviors in addition to suicide completion (Conroy & Smith, 1983; Heinrich & Gullone, 2006; Kirkpatrick-Smith, Rich, Bonner, & Jans, 1991; Maris, 1981; Peck, 1983).

**Affective Features.** Lonely individuals tend to experience a host of negative emotions and affective disturbances. Based on a factor-analytic study, Rubenstein and Shaver (1982) found that the affective disturbances that coincided with loneliness represented four distinct clusters of feelings associated with the experience: desperation, depression, impatient boredom, and self-deprecation. Desperation was characterized by feelings of panic, fear, helplessness, and hopelessness. Depression comprised of feelings of sadness, depression, emptiness, and isolation.
Impatient boredom, entailed feelings of impatience, uneasiness, hostility, and difficulty with concentration. Self-deprecation was indicative of feelings of shame and insecurity. Other affective correlates have been observed including neuroticism and anhedonia (Bradburn, 1969).

**Cognitive Features.** An individual’s thoughts about himself or herself can significantly impact the ability to form satisfying relationships with others. These cognitive processes influence the ways in which one interacts with others within the social environment as well as how one interprets the behavior of others. A cluster of dysfunctional attributional styles is believed to give rise to and exacerbate feelings of loneliness. Furthermore, lonely individuals are more likely to derive uncontrollable, internal, and stable attributions in order to derive an understanding about their own distress (Heinrich & Gullone, 2006; Murphy & Kupshik, 1992; Peplau & Perlman, 1982). Specifically, they are more likely to view their circumstances as being beyond their control (uncontrollable), believe that the deficits in their social relationships are the result of perceived inadequacies about the self (internal), and view the present situation as being unchangeable (stable) (Heinrich & Gullone, 2006). Not surprisingly, loneliness has been firmly linked to low self-esteem across the lifespan (Fordham & Stevenson-Hinde, 1999; Rubin & Mills, 1988). As such, lonely people have been found to possess negative and self-deprecating views about themselves, believing that they are inferior, worthless, unlovable, and socially inept (Jones & Moore, 1987).

Loneliness may also lead to negative self-conceptions. In line with this notion, Gardner et al. (2000) suggested that the failure to establish meaningful social relationships is likely to direct cognitive processing resources inward and bias memory for social cues. Indeed, loneliness has been associated with heightened self-consciousness and self-focus, both of which have been associated with negative affect and self-destructive behavior (Goswick & Jones, 1981, Moore &
Shultz, 1983). Therefore, the affective and behavioral manifestations of loneliness are likely to exacerbate the severity of persistent negative thoughts, creating more complications when they fail to abate with the passage of time.

**Rumination**

The frequency and duration of psychological distress varies considerably. People may respond to their distress by adopting different coping strategies to understand the experience. However, people may be more prone to respond to stressful experiences by engaging in perseverative cognitions. Research has consistently emphasized the maladaptive nature of perseverative cognitions. Moreover, the underlying thought processes are believed to increase the risk of affective disturbances and inadvertently compromise psychological well-being.

Rumination is one type of perseverative cognition that has received considerable attention and has been considered an underlying factor in the etiology and maintenance of mood disorders (Querstret & Cropley, 2013). The response styles theory, originally proposed by Nolen-Hoeksema (1991) describes rumination as the persistent and negative thought patterns related to the causes and consequences of personal distress. Research suggests that the tendency to engage in ruminative thinking stems from cognitive biases involving memory and attention that inadvertently increases sensitivity to negative stimuli (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Much research has linked rumination to protracted periods of dysphoric mood and prolonged depressive episodes (Lyubomirsky & Nolen-Hoeksema, 1993; Nolen-Hoeksema, 1991; Nolen-Hoeksema & Morrow, 1993; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Wulsin,Vaillant, & Wells, 1999; Querstret & Cropley, 2013). While the response styles theory emphasizes the relationship between ruminative thinking and depressive symptomatology, correlational research has linked rumination with a host of maladaptive
cognitive styles such as dysfunctional attitudes, negative attributional styles, hopelessness, neuroticism, and loneliness (Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Trapnell & Campbell, 1999).

Many other definitions of rumination have been proposed, the majority of which describe it as a form of self-focused attention about past negative events marked predominantly by repetitive, intrusive, and negative thought processes (Querstret & Cropley, 2013).

**Private Self-Consciousness: Self-Rumination and Self-Reflection.** Rumination involves a heightened degree of self-focus in the sense that attention is directed towards internal private experiences. Indeed, heightened self-focus is associated with emotional distress, symptoms of psychopathology, and functional impairments within both intrapersonal and interpersonal domains. Paradoxically, self-focus has also been associated with psychological adjustment, enhanced self-knowledge, and autonomy in addition to behavioral dispositions towards intellectual curiosity, openness to experience, and philosophical thinking (Nasby, 1985; Joireman, Parrott, Hammersla, 2002; Trapnell & Campbell 1999). Trapnell and Campbell (1999) described this unusual pattern of findings as the “*self-absorption paradox*” (p. 286). The authors suggested that the underlying nature of this paradoxical relationship is vested within the context of private self-consciousness, defined as consciousness about inner thoughts, feelings, and experiences.

In order to determine the specific components of self-focus that give rise to the stark differences in private self-consciousness, Trapnell and Campbell (1999) conducted a lexical analysis of empirically validated self-consciousness scales and personality inventories. The results yielded two distinct forms of self-focus: *self-rumination* and *self-reflection*. Self-rumination was correlated with neuroticism while self-reflection was correlated with openness to
experience. Furthermore, the majority of high scores on the rumination component were associated with psychological distress and the high scores on the reflection component were associated with intellectual traits, suggesting polarized dispositions in the predilection for self-focus (Trapnell & Campbell, 1999). The Rumination-Reflection Questionnaire (RRQ) was created based on the analysis and the authors went on to infer that the dispositional variations in private self-consciousness reflect differences in the motivations for directing attention towards the self. Individuals inclined to evaluate negative experiences or perceived inadequacies are more likely to engage in self-rumination while those motivated by a desire for insight or curiosity are more likely to engage in self-reflection. Both forms of self-focus involve attention towards inner states that inadvertently heightens awareness of those particular states, thereby influencing the ways in which those states are experienced.

**Potential Mechanisms and Consequences of Chronic Ruminaton.** There are several potential mechanisms by which the detrimental effects of rumination manifest. According to Nolen-Hoeksema et al. (2008), distress activates negative thoughts and memory biases, potentially increasing an individual’s propensity to engage in perpetual dwelling about the reasons for any losses or injustices incurred from adverse events. Rumination is believed to inhibit active problem solving by distorting otherwise rational thought processes, thereby influencing an individual to perceive his or her circumstances as condemning and uncontrollable. Moreover, rumination is also believed to hinder instrumental behavior, inadvertently resulting in additional distress (Nolen-Hoeksema et al., 2008).

**Cognitive Deficits.** Ruminative thinking has the potential to impair concentration and memory, potentially leading to poor performance on various tasks. Furthermore, rumination utilizes the limited cognitive resources available for information processing, thereby
undermining an individual’s ability to successfully complete cognitively demanding tasks. A series of empirical studies has found that dysphoric college students who engaged in rumination reported experiencing significant difficulties with maintaining attention on academic coursework, completing examinations, reading, and time management (Lyubomirsky, Boehm, Kasri, & Zehm, 2011). Nolen-Hoeksema et al. (2008) suggested that rumination might be associated with cognitive biases for negative information. Similarly, studies have found that participants instructed to ruminate exhibited significant difficulties with the recollection of positive autobiographical memories (Joorman & Seimer, 2004; Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; McFarland & Buehler, 1998).

**Health Consequences.** As previously noted, ruminative thinking tends to prolong distress and affective disturbances. Not surprisingly, rumination has been linked to physical health complications across different populations. For instance, correlational studies have revealed a relationship between rumination and reduced medical compliance in cancer patients (Aymanns, Filipp, & Klauer, 1995). Furthermore, rumination has been linked to genuine somatic distress, high blood pressure, and higher levels of pain intensity (Sansone & Sansone, 2012; Segerstrom, Roach, Evans, Schipper, & Darville, 2010; Watkins, 2008). Chronic rumination has also predicted re-hospitalization within 4 months of experiencing a health crisis such as a coronary heart attack (Fritz, 1999). People who engage in this type of behavior are at a heightened risk for self-destructive behavior, namely drug and alcohol abuse (Nolen-Hoeksema, 1991).

**Social Support.** People who chronically ruminate often behave in ways that dampen their social relationships and in turn may lead to an overall reduction in social support over time. In line with this notion, Nolen-Hoeksema and Davis (1999) found that chronic ruminators reported increased friction and less emotional support from others. Examination of ruminative
participants’ self-reports suggest that people within their social network often experience frustration with ruminators’ incessant desire to discuss their personal distress in conjunction with its implications for their lives (Nolen-Hoeksema & Larson, 1999; Schwartz & McCombs, 1995). Moreover, others often perceive chronic ruminators less favorably and are more likely to describe them as being self-centered, clingy, and hostile (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Since satisfying social relationships significantly influence psychological well-being, the loss of social support as a result of rumination can prolong distress and inadvertently increase the severity of ruminative thinking.

**Distraction: An Alternative to Rumination.** A viable approach aimed at providing relief from the distress associated with active engagement in ruminative thinking is distraction. In this context, the purpose of distraction is to divert attention away from the maladaptive thought patterns associated with rumination (Broderick, 2005; Nolen-Hoeksema, 1991). The types of distraction utilized by people seeking relief from dysphoria are usually positive or neutral in nature and emphasized by pleasant or innocuous activities and thoughts that are engaging, absorbing, and satisfying as well as capable of improving mood in some respect (Nolen-Hoeksema, 1991; Nolen-Hoeksema, Lyubomirsky, & Wisco, 2008). According to Nolen-Hoeksema (1991), engaging in distraction may replenish the limited cognitive processing resources that are otherwise taxed and depleted by ruminative thinking, thereby facilitating problem-solving. In line with this notion, studies have revealed that participants instructed to use positive distractions in response to dysphoria often report endorsing significantly more effective problem-solving strategies in comparison to participants prompted to ruminate (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Lyubomirsky, Kasri, & Zehm, 2003; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993). Additionally, the level of motivation for
overcoming distress in addition to the willingness to utilize distractive approaches have been found to predict significant reductions in depressive symptomatology (Burns & Nolen-Hoeksema, 1991; Kavanagh & Wilson, 1989).

Although distraction has received considerable empirical support, the approach has been shown to be effective for a relatively short-duration (Nolen-Hoeksema, 1991; Nolen-Hoeksema, Lyubomirsky, & Wisco, 2008). Some have contended that the use of diversions to avoid the content of ruminative thoughts is indicative of poor tolerance for distress (Broderick, 2005; Linehan, 1993). Furthermore, distraction involves some level of resistance that is often expressed through deliberate attempts to suppress unwanted thoughts out of conscious awareness, a strategy that can paradoxically exacerbate the frequency and severity of maladaptive thought patterns (Broderick, 2005). Therefore, it would be worthwhile to examine the approaches, strategies, and techniques that may provide long-term relief from the self-destructive nature of ruminative thinking.

**Mindfulness**

In recent years, there has been a growing body of literature linking mindfulness to positive health and subjective well-being (Brown & Ryan, 2003; Stillman, Feldman, Wambach, Howard, & Howard, 2014). Mindfulness is a multidimensional construct that refers to a state of consciousness marked by a heightened sense of attention to and awareness of the present moment. In this respect, *awareness* represents the perceptual process that consistently monitors the internal and external environment. Conversely, *attention* serves to focus conscious awareness by acting as a bottleneck thereby, heightening sensitivity to specific stimuli that enters into the stream of consciousness (Brown & Ryan, 2003; Westen, 1999). An individual may be aware of either internal or external stimuli without them being at the center of attention. In order for one to
evoke mindfulness both attention and awareness must be affected in tandem and directed towards the present reality.

Mindfulness originates from ancient Buddhist and Eastern pan-Asian contemplative traditions with an over 2,500-year history and emphasizes the practice of meditation in order to keep “consciousness alive to the present reality” (Hanh, 1976, p.11). Over the years, many interpretations of the concept have emerged from various disciplines, most notably eastern traditions, namely Buddhism and western contemplative psychology. For instance, Thera (1972) described mindfulness as “the clear and single-minded awareness of what actually happens to us and in us at the successive moments of perception” (p.5). In the west, Kabat-Zinn (1995) characterized mindfulness as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (p.4). The current conceptualizations of mindfulness range from a single experiential technique with an emphasis on acceptance to a form of nonjudgmental awareness as well as a dispositional characteristic and multidimensional activity maintained through consistent practice and training (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bishop et al., 2004; Brown & Ryan, 2003; Davis & Hayes, 2011; Grossman & Van Dam, 2011; Kabat-Zinn, 1990). Taken together, these related findings indicate that mindfulness, whether a naturally occurring inherent disposition or an attitude cultivated through meditative practices, is the conscious awareness of the thoughts, feelings, and sensations occurring within the present moment without resistance, judgment, or reactivity.

**Eastern Origins.** The term *mindfulness* represents the English translation of the archaic Pali word, *sati*, which has been interpreted as meaning ‘to remember, attention, or awareness’ (Black, 2011; Davis & Hayes, 2011). Scholars have interpreted *sati* as describing an ability to
remember to maintain awareness and attention on the immediate experience with conscious effort and perceptiveness (Shapiro & Carlson, 2009).

**Buddhism.** Mindfulness has been a staple of the Buddhist tradition for over 2,500 years and is rooted in the teachings of Siddhartha Gautama—‘The Buddha’ between the early fifth and sixth centuries B.C.E. The concept is extensively featured in ancient Buddhist scriptures of the Buddha’s sermons, detailing his journey towards enlightenment and insight into the nature and phenomenology of human suffering (Bodhi, 2000; Kumar, 2002; Nyanaponika, 1962). An integral theme that encompasses the teachings is the notion of dependent origination, which posits that the mind creates suffering as a natural product of more complex mental processes (Silananda, 2002). Based on his experiences, Gautama established the Four Noble Truths in order to explain his insight about how the mind contributes to human suffering. These truths state that:

1) Suffering is an ingrained part of existence.

2) The root of all suffering is related to the tendency to latch on to objects of impermanence.

3) The cessation of suffering is possible by eliminating the craving to latch onto objects of impermanence

4) Following the Noble Eightfold Path will alleviate human suffering and foster enlightenment (Kumar, 2002; Nyanaponika, 1962).

The four noble truths are presented in a manner analogous to classical medicine, whereby the first truth represents the diagnosis, the second pertains to the etiology and maintenance of the issue, the third reflects the prognosis, and finally the fourth details the prescription. Mindfulness is a fundamental component of the Noble Eightfold Path provided by Gautama which pertains to
the adoption of the: right view, right intention, right speech, right action, right livelihood, right effort, right mindfulness, and right concentration (Nyanaponika, 1962; Kumar, 2002; Silananda, 2002).

**Satipatthana Sutta: The Four Foundations of Mindfulness.** Mindfulness is described as an embodied practice in the *Satipatthana Sutta*, a discourse translated in English as *The Foundations of Mindfulness* that provides instructions about how to evoke the experience. Each technique is directed towards achieving:

1) Mindfulness of the body.

2) Mindfulness of the feelings and sensations

3) Mindfulness of consciousness.

4) Mindfulness of all mental phenomena.

The Buddha believed that practicing mindfulness in conjunction with adherence to the Eightfold Path would ostensibly lead to the cessation of pain and suffering and the experience of feelings of compassion, kindness, joy, and equanimity. He also referred to the four foundations of mindfulness as a direct path towards the realization of nirvana (Bodhi, 2000; Kumar, 2002; Silananda, 2002).

**Western Interpretations and Practice.** Many attempts have been made within western psychology to incorporate the traditional Eastern origins of mindfulness into the more modern theoretical frameworks of human behavior. In addition to attention and awareness, the western conceptualizations include additional related constructs such as acceptance, attention, curiosity, openness, and receptivity; the extent to which these constructs are emphasized in psychological research varies considerably. However, the empirical literature within western psychology distinguishes mindfulness from habitual or automatic modes of functioning and behavior and
examines the concept as a transitional path towards optimal well-being (Baer et al., 2006; Bishop et al., 2004; Brown & Ryan, 2003; Davis & Hayes, 2011; Grossman & Van Dam, 2011; Kabat-Zinn, 1994; Otani, 2003; Tops et al., 2014). This transitional path accounts for the cognitive, affective, and behavioral domains that mindfulness is believed to affect in ways that alleviate suffering.

Different perspectives have been offered with the intent of establishing a more concrete definition of mindfulness. The definitions proposed have been supported by a host of psychological research, each of which serves as the basis for in-depth explorations of the multifaceted construct and its relationship with health and wellbeing.

**State, Trait, and Skill.** Mindfulness has been purported to possess both state- and trait-like qualities. As a state, mindfulness represents a transient change in consciousness that manifests subsequent to a session of meditation. Conversely, by trait, it is assumed that variations exist in the capacity to evoke and experience mindfulness, the extent to which remains stable across time and can be reinforced or blunted based on a variety of different factors (Brown & Ryan, 2003; Smalley et al., 2009). Furthermore, due to individual predispositions, inclinations, and capabilities, some may be more or less prone to experience the enhanced awareness of and receptive attention to the present moment. Additional research has found that dispositional trait mindfulness is associated with superior performance on cognitive tasks involving sustained attention and inhibitory control (Oberle et al., 2011). Furthermore, those with inherently higher levels of mindfulness have been shown to exhibit persistence on challenging tasks, suggesting that individuals with a more natural inclination towards mindfulness are more likely to regulate emotional arousal and cognitive resources over a prolonged period of time in spite of frustration or distress (Oberle, Schonert-Reichl, Lawlor & Thomson, 2011; Stillman, Feldman, Wambach,
Howard, & Howard, 2014). Mindfulness can also be conceptualized as a skill aimed at orienting oneself towards the present moment, which is fostered through the consistent and frequent practice of meditation. Indeed, gradual refinements in mindfulness skills are associated with long-term benefits such as higher levels of cognitive flexibility, problem-solving capability, and distress tolerance (Oberle et al., 2011). From this perspective, mindfulness involves the use of cognitive processes related to executive function, specifically inhibitory control and self-regulation in such a way that results in a heightened ability to direct inner experiences towards the present moment across everyday life in an open and accepting manner.

**Two Component Model.** Bishop et al. (2004) proposed the two-component model in order to provide a testable operational definition for clinical researchers and practitioners. This model of mindfulness describes mindfulness as a mode of awareness consisting of two distinct yet interrelated components: “The first component involves the self-regulation of attention so that it is maintained on immediate experience, thereby allowing for increased recognition of mental events in the present moment. The second component involves adopting a particular orientation toward one’s experiences in the present moment, an orientation that is characterized by curiosity, openness, and acceptance” (Bishop et al., 2004, p.232). The conceptual model draws from self-regulation models of cognition and mood in addition to contemporary frameworks of psychopathology in order to provide support for its application within clinical practice.

Each component is purported to include the behaviors, experiential manifestations, and implicated psychological processes thought to support the experience of mindfulness, respectively. The self-regulation of attention is described as a metacognitive skill that entails both controlling cognitive processes (e.g. attention) and monitoring the content within the stream
of consciousness. Conversely, orientation to experience component is developed through mental training such as meditation. This component entails adopting an attitude marked by curiosity and acceptance. Curiosity reflects the overall awareness of the thoughts, feelings, and sensations that protrude into the stream of consciousness during training (Bishop et al., 2004) Acceptance in the context of this mode is described as an attitude of openness and receptivity towards experience (Bishop et al., 2004; Roemer & Orsillo, 2002).

Mindfulness and Meditation. While mindfulness can potentially enhance subjective wellbeing and mental health, methods used to cultivate the experience should not be considered a form of relaxation nor should they be employed to induce such a state (Bishop et al., 2004). Practicing mindfulness is considered a form of mental training whereby attention and awareness are affected in a manner that reduces the propensity to engage in the reactive modes of functioning that may give rise to feelings of distress. Moreover, mindfulness can be practiced both formally and informally. Formal mindfulness emphasizes allotting time for training and emphasizes sustained attention. Informal mindfulness entails the application of the enhanced attention and awareness cultivated through formal training towards everyday life on a moment-by-moment basis (Bishop et al., 2004; Kabat-Zinn, 1990; Kabat-Zinn, 1995; Linehan, 1993).

Myriad techniques can be employed to foster mindfulness but the experience is often acquired through meditation. Moreover, the terms mindfulness and meditation are often used interchangeably. However, it is important to note that both terms are distinct concepts. Meditation refers to the constellation of complex attentional regulatory practices whereby mental, emotional, and somatic events are affected through the maintenance of a specific attentional set (Bodhi, 1994; Davis & Hayes, 2011; Grossman & Van Dam, 2011; Kabat-Zinn,
In this respect, meditation is viewed as precursor for evoking and maintaining the experience of mindfulness.

Similar to mindfulness, meditation has a long and rich history within different cultures that have in turn influenced practice of the technique in the west. The practice of meditation as conceptualized by western practitioners originates from Buddhism but the technique has also been a staple of many different religions including Christianity, Judaism, Hinduism, and Jainism, among others (Nisbett, 2003; Otani, 2003).

The Buddha described meditation as a method of overcoming sorrow, distress, pain, and sadness in addition to fostering feelings of contentment in isolated conditions (Bodhi, 1994; Walshe, 1987). His teachings spread to two parts of Asia, which were later modified and refined: the Theravada tradition within the Southeast Asia and the Mahayana tradition towards the Far East regions of Asia, respectively (Otani, 2003). The Theravada tradition emphasizes two forms of meditation: samatha-samadhi (‘tranquil dwelling’) and vipassana (‘insight achieving’). Silananda (1990) describes samatha as the strand of concentration that entails anchoring attention towards a specific object and vipassana as the strand of awareness involving attention towards physical sensations, thoughts, and feeling. Samatha meditation is believed to unify, compose, and concentrate the mind whereas, vipassana is believed to help an individual observe, explore, and discern. Buddhist texts state that only skilled practice of vipassana meditation can induce the altered state of consciousness underlying mindfulness but the experience cannot be achieved unless the practitioner has established the enhanced concentration acquired through samatha (Bodhi, 1994; Davis & Hayes, 2011; Grossman & Van Dam, 2011; Krishnamurti, 1999; Silananda, 1990; Thera, 1962). Mental training in the Mahayana tradition incorporates the use of visualization and mantras as evident within Tonglen meditation, a technique practiced by Tibetan
monks aimed at cultivating compassion for all living beings as well as components of Zen meditation, a spiritual practice based in part on the metaphysical aspects of Taoism (Otani, 2003).

Meditation was introduced in the west in order to promote wellbeing and enhance the ability to experience the benefits of mindfulness across everyday life. The established meditative techniques are derived from the Theravada tradition and have since been modified for western practice. There are two main types of meditation practiced: focused attention (FA) and open-monitoring (OM) meditation. FA is a type of concentration meditation based in part on samatha and entails anchoring attention on a specific and often trivial stimulus such as the breath, a physical sensation in the body, or a mantra while simultaneously monitoring the attentional field for any distractions that protrude into the stream of consciousness. Consistent practice will gradually result in the ability to disengage attention from sources of distraction and redirect attention towards the intended object (Lutz et al., 2008; Tops et al., 2014). Studies have shown that individuals who practice FA meditation are able to sustain attention on cognitively demanding tasks over a prolonged period of time and exhibit a heightened ability to detect mind-wandering and distraction in comparison to non-meditators (Hasenkamp, Wilson-Mendenhall, Duncan, Barsalou, 2012; Tops et al., 2014; Kozasa et al., 2015). Conversely, OM, also known as mindfulness meditation, pertains to a style of insight meditation based in part on the vipassana tradition. In contrast to FA, attention is not directed towards a specific object or event, instead the target of meditation becomes the act of monitoring awareness, itself (Lippelt, Hommel, & Colzato, 2014; Lutz et al., 2008). The goal of OM is to maintain the monitoring state without responding to any object that enters the stream of consciousness. Moreover, OM and FA are
practiced both formally and informally and used in tandem with non-meditative exercises, most notably yoga and tai-chi (Davis & Hayes, 2011; Kabat-Zinn, 1990; Kabat-Zinn, 2005).

**Assessing Mindfulness.** The burgeoning interest in mindfulness and the potential mechanisms by which the practice of mindfulness exerts its transformative benefits has led to the construction of a considerable number of self-report measures aimed at acquiring a better understanding of the underlying nature of the construct (Baer et al., 2004). The valid and reliable self-report measures available for psychological research vary in their intent to empirically examine the state- and trait-like properties implicated in the experience of mindfulness as well as the effects of both long- and short-term practice across various populations ranging from expert Buddhist monks to novice practitioners (Baer, Smith, & Allen, 2004; Brown & Ryan, 2003; Tops et al., 2014; Travis & Shear, 2010).

**The Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan).** The MAAS is a single factor, 15-item self-report instrument for measuring mindfulness in relation to self-regulatory models of attention and self-awareness. Furthermore, the scale is used to measure both the state and trait like properties of the experience. The MAAS was formally developed by Brown and Ryan (2003) based on their unidimensional conceptualization of the construct. The authors believed that the potential to maintain attention and awareness on the present moment is embedded within each individual but differs in frequency across modalities of everyday life (Baer et al., 2006; Brown & Ryan, 2003; Brown & Ryan, 2004). Based on this notion, some people may be better able to regulate their attention and disengage from automatic modes of functioning more often than others. The scale has since been utilized to measure the relationship between mindfulness and multiple dimensions of psychological well-being.
MAAS scores were associated with lower levels of the neuroticism among the “Big-Five” personality traits. Based on the NEO-PI neuroticism scale, negative correlations were revealed between the MAAS and Depression, Self-Consciousness, Hostility, and Impulsivity (Brown & Ryan, 2003). Furthermore, higher self-esteem scores on the Multidimensional Self-Esteem Inventory and Rosenberg measures were associated with higher MAAS scores (Brown & Ryan, 2003). Expert meditators had higher MAAS scores in conjunction with lower levels of anxiety, depression, and self-consciousness in comparison to community controls. Higher scores also predicted subjective psychological wellbeing and emotional self-regulation. Conversely, lower scores on the measure were associated with higher levels of rumination and negative affect (Baer et al., 2006; Brown & Ryan, 2003; Brown & Ryan, 2004).

The Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001). The FMI contains 30-items that provide descriptive statements designed to measure nonjudgmental observation of the present moment and openness to negative experience. Buchheld, Grossman, and Walach (2001) constructed the scale in order to quantitatively assess changes resulting from prior experience with meditation. The authors underlying conceptualization of mindfulness is based primarily on the state like properties of the construct and a unidimensional interpretation of the scale is emphasized. Changes in self-report scores have been evident during pre and post phases of mindfulness retreats (Baer et al., 2006; Buchheld et al., 2001).

The Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004). The KIMS is a 39-item self-report instrument designed to measure the individual tendency to remain mindful across everyday life. Prior experience with meditation is not required. The items are based predominantly on the concept of mindfulness from the realm of Dialectical Behavior
Therapy and measures the four core components of mindfulness as described by the theoretical framework: observing, describing, acting with awareness, and accepting without judgment (Baer, Smith, & Allen, 2004; Baer et al., 2006; Linehan, 1993). The *observing* factor entails noticing both internal and external stimuli as they present themselves across everyday life. The *describing* factor involves the description and labeling of observed events by verbal expression, in a nonjudgmental, neutral manner. The *acting with awareness* factor surrounds the extent to which one is attentive and fully present in any given activity or task. The *accepting without judgment* factor examines the individual tendency to allow any event to occur within the present moment without attempting to modify, avoid, or escape it.

The *observe* and *describe* factors were positively correlated with emotional intelligence and negatively correlated with alexithymia. Conversely, the *describe, act with awareness*, and *acceptance* components of the KIMS yielded negative correlations with measures of psychopathology and the neuroticism personality dimension. However, the observe factor alone was positively correlated with the openness personality dimension. Both exploratory and confirmatory factor analysis have yielded support for the multidimensional, four-factor conceptualization of mindfulness (Baer, Smith, & Allen, 2004; Baer et al., 2006). The results suggest that deficits in the mindfulness skills as indicated by low scores on the KIMS, may be associated with negative affect and distress. Scores obtained from the KIMS have been significantly lower for individuals suffering from borderline personality disorder in comparison to control populations (Baer, Smith, & Allen, 2004). The KIMS may be useful for clinicians to monitor any strengths and weaknesses in their clients’ development of mindfulness skills.

*The Cognitive and Affective Mindfulness Scale (CAMS; Feldman, Hayes, Kumar, & Greeson, 2007)*. The CAMS is a 12-item self-report questionnaire designed to measure
individual differences in the capacity to evoke mindfulness with attention, awareness, present-focus, and acceptance of the thoughts and feelings that emerge during daily life. Higher scores were associated with cognitive flexibility and well-being as well as lower levels of rumination, anxiety, and depression (Feldman et al., 2007; Hayes & Feldman, 2004). Furthermore, the instrument is susceptible to increases in mindfulness training and increases in scores have been observed in a treatment group upon completion of integrative psychotherapy (Hayes & Harris, 2000).

**The Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005).** The MQ is a 16-item instrument intended to assess individual response to distressing thoughts and images. Chadwick et al. (2005) emphasized that the items represent four aspects of mindfulness: mindful observation, letting go, nonaversion, and nonjudgment. There have been significant differences in scores on this measure between experienced meditators and nonmeditators in addition to increased scores for participants upon completion of an MBSR-training course (Baer et al., 2006).

**The Five-facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006).** The Five-facet Mindfulness Questionnaire (FFMQ) is a firmly established and psychometrically validated self-report questionnaire centered on measuring mindfulness. Moreover, the FFMQ contains approximately 39-items, each of which were derived from a factor analysis of specific items drawn from the MAAS, FFMI, KIMS, CAMS, and MQ, collectively (Baer et al., 2006). The analyses revealed five distinct and interpretable facets believed to underlie mindfulness: 1) observe; 2) describe; 3) act with awareness; 4) nonjudgment of inner experience; 5) nonreactivity. Hierarchical confirmatory factor analyses yielded correlations in the predicted directions for all but the observe facet with a variety of both positive and negative dimensions of
well-being such as openness to experience, emotional intelligence, and absent mindedness (Baer et al., 2006). Furthermore, the four facets were shown to possess incremental validity in predicting symptoms of psychopathology. The observe factor was found to be moderately susceptible to the practice of meditation and it was implied that training may moderate the relationship between this factor and psychological symptoms with correlations significantly predicting psychological outcomes in meditators. However, a similar relationship failed to occur for non-meditators. The FFMQ revealed that all of the aforementioned mindfulness facets with the exception of act with awareness were positively correlated with meditation. The authors emphasized the importance of conceptualizing mindfulness as a multifaceted construct in order to better understand its relationship with dimensions of psychological health and well-being.

Mindfulness-based Interventions. Mindfulness has been incorporated into many therapeutic interventions, which have been utilized to help people cope with both physical and mental illnesses. Many mindfulness-based interventions have been applied for the treatment of issues related to various forms of psychopathology such as substance abuse, attention deficit hyperactivity disorder (ADHD), borderline personality disorder (BPD), post-traumatic stress disorder (PTSD), and eating disorders (Davis & Hayes, 2011). Formal and informal mindfulness techniques have been employed in both clinical and nonclinical settings. Some of the more common mindfulness-based interventions include mindfulness-based stress reduction (MBSR) and the third wave behavioral therapies, most notably mindfulness-based cognitive therapy (MBCT), dialectical behavior therapy (DBT), and acceptance and commitment therapy (ACT).

an 8-week intensive outpatient group stress reduction and relaxation program based on mindfulness meditation as well as other techniques such as yoga and body awareness (Miller, Fletcher, & Kabat-Zinn, 1995). The intervention is designed to help people cope with chronic illnesses and lead a more fulfilling life (Kabat-Zinn, 1990; Kabat-Zinn, 1994).

The techniques and exercises taught within MBSR are based on ancient spiritual practices (e.g. Buddhism) and modified for secular use (Greeson et al., 2011). All the mindfulness exercises can be practiced both formally and informally within different contexts. One of the first mindfulness exercises introduced to participants is the formal practice of mindfully eating a raisin whereby, a raisin is consumed with awareness of all bodily sensations that arise during the process (Kabat-Zinn, 1990; Kabat-Zinn, 2003; Stahl & Goldstein, 2011). Another notable exercise is the body-scan technique designed to enhance connection between both mental and physical processes (Stahl & Goldstein, 2010).

Approximately 100 randomized-clinical trials of MBSR have been published since 2014 and the intervention has been supported by empirical evidence demonstrating both short-term and long-term benefits for stress-management and symptom relief for a wide range of both physiological and psychological issues (Bohlmeijer et al., 2010; Creswell et al., 2012; Dobkin, 2008; Dobkin & Zhao, 2011; Greeson et al., 2011; Hoffman, Sawyer, Witt, & Oh, 2010; Miller, Fletcher, & Kabat-Zinn, 1995; Ospina et al., 2007; Pickert, 2014; Ramel, Goldin, Carmona, & McQuaid, 2004; Zgierska, Rabago, Chawla, Kushner, Koehler, & Marlatt, 2009).

**Dialectical Behavior Therapy (DBT; Linehan, 1993).** DBT is a comprehensive cognitive-behavioral approach originally designed to treat patients suffering from borderline personality disorder as well as those with a long-standing history of suicidal and parasuicidal behavior (Dimeff & Linehan, 2001). The overarching goals of DBT are oriented towards helping
patients combat psychological and emotional distress through the development of healthy coping
skills as well as improving both emotional and cognitive regulation through enhanced awareness
of the reactive states that give rise to maladaptive behavior. In DBT, there is an emphasis on
striking a balance between acceptance and change, two opposing ideas, ostensibly achieved
through validation. The underlying rationale of this approach is that validation results in the
acceptance of negative thoughts, distressing emotions, and behavioral predispositions by
reducing the tendency to struggle against them, thereby making gradual change more feasible.

Mindfulness represents an integral component of DBT as it is classified as a “core” skill
aimed at helping patients accept and tolerate their experiences across everyday life. Deficits in
this skill are believed to be indicative of emotional dysregulation and impulsive behavior
(Linehan, 1993). The six mindfulness skills taught, derived from Zen Buddhism, are evenly
divided into three “what” and “how” skills, respectively. The “what” skills are based on
maintaining awareness and are cultivated with techniques aimed at enhancing the client’s ability
to observe, describe, and participate fully across multiple life domains (Dimeff & Linehan, 2001;
Linehan, 1993). The “how” skills are based on establishing a nonjudgmental stance, maintaining
attention on one event, and behaving effectively without interpreting every event or experience
as inherently “good” or “bad”, “right” or “wrong”, or “fair” or “unfair” (Linehan, 1993). These
approaches, along with the other therapeutic techniques, have been supported by empirical
evidence and have been used to treat substance abuse, eating disorders, and survivors of sexual
trauma (Janowsky, 1999).

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999).
Acceptance and Commitment Therapy (ACT) is a therapeutic intervention grounded in
functional contextualism, a branch of behavioral analysis and the theory of language and
cognition rooted in Relational Frame Theory (RFT; Hayes et al., 2001). RFT posits that the way language governs behavior and directs experience inadvertently leads to suffering, especially when people try to avoid confronting difficult thoughts, feelings, and experiences (Hayes et al., 1996; Hayes et al., 1999; Hayes, 2002; Hayes, Strosahl, & Wilson, 2012; Zettle, 2005).

The RFT posits that humans by nature are psychologically healthy but the ways in which the underlying maladaptive cognitive processes influence overt behavior are ultimately self-destructive (Hayes, 2002; Hayes et al., 2012). Human suffering is believed to be the by-product of experiential avoidance, cognitive entanglement, attachment to a conceptualized representation of the self, absence of contact with the present, and failure to implement active goal-oriented behavior consistent with core goals and values. The rigid thinking pattern that emerges from these issues ultimately exacerbates distress. Hayes et al. (1996) provide four concepts that better explain the ACT approach to psychopathology:

1. **Cognitive fusion**, which represents the attachment to the thoughts that emerge across everyday life. When an individual’s attention is directed internally towards thoughts, memories, beliefs, or assumptions, it prevents the direct experience from the five sensory modalities from reaching the stream of consciousness.

2. **Evaluation of experience** refers to the appraisal of thoughts, feelings, and experiences.

3. **Experiential avoidance** results from an individual’s unwillingness to remain in contact with private experiences and attempts to change the form, frequency, or severity of such events.

4. **Reason giving** pertains to the individual attempts to justify behavior. This aspect often cultivates resistance to change and reinforces experiential avoidance.
The overarching goal of ACT is to enhance *psychological flexibility*, which is defined as the ability to remain in contact with the present moment based on the current situation while simultaneously altering or maintaining behavior in accordance with individual values (Hayes et al., 1996; Hayes et al., 1999; Hayes, 2002; Hayes et al., 2012). ACT combines acceptance approaches with mindfulness skills to facilitate behavioral change and help individuals remain consistent with their goals and values. Acceptance approaches in the context of the framework aims to alter the function of private experiences and its association with overt behavior instead of modifying the form and frequency (Hayes et al., 1999; Hayes, 2002). The mindfulness skills are intended to reduce cognitive fusion by helping people distance from unpleasant thoughts, beliefs, and memories, acknowledge both the internal and external events that surface across daily life without resistance, and fully engage with the present moment with an attitude of openness and curiosity. An example of a mindfulness technique commonly used in ACT is the “Leaves on a Stream” exercise whereby an individual is taught to distance from automatic thought patterns by visualizing each thought that enters consciousness as a leaf on a continuous stream (Harris, 2009). Instead of latching onto a particular thought or set of thoughts the individual is told to observe each thought and allow it to flow freely. The exercises are also designed to help people remain in contact with the transcendent sense of self that fosters acceptance, clarify values, and commit to effective behavioral strategies (Hayes, 2002; Hayes et al., 2012). ACT has been supported by empirical evidence, which has demonstrated effectiveness for a variety of conditions such as chronic pain, mood disorders, anxiety, thought disorders, post-traumatic stress disorder, substance abuse, and eating disorders (Alonso, Lopez, Losada, & Gonzalez, 2013; Avdagic, Morrissey, & Boschen, 2014; Bach & Hayes, 2002; Baer, Fischer, & Huss, 2005; Batten & Hayes, 2005; Block & Wulfert, 2000).
Unstress II. Unstress was developed in New Zealand by Raeburn, Atkinson, Dubignon, McPherson, & Elkind (1993) in order to provide a cost-effective, group-based intervention for dissemination at the community level. The emphasis of Unstress was based on enhancing community mental health and the underlying goal of the intervention was directed towards improving skills and competency for coping with perceived stress. Moreover, the intervention modalities integrated cognitive behavioral strategies for stress management into group-based exercises delivered over the span of 10 weekly, 90-minute sessions, all of which were facilitated by trained leaders and paraprofessionals. Unstress demonstrated efficacy for its usage in community settings and participants reported significant reductions in stress across everyday life in addition to increased subjective well-being (Raeburn et al., 1993).

Jeffery Snarr, Ph.D. recently developed “Unstress II”, a group-mindfulness based intervention using the principles of the original structure of Unstress. However, the content of Unstress II is based upon the mindfulness skills and exercises drawn from within the ACT tradition. The intervention sessions are administered via 8-weekly, pre-recorded sessions over the course of the academic semester at The College at Brockport—State University of New York (SUNY). Participants have included undergraduate students, graduate students, and faculty members of the college in addition to members of the surrounding community.

Mindfulness and Ruminaton. Ruminative thinking is associated with a lack of acceptance of and persistent dwelling on both internal and external stressors experienced in the past (Ciesla et al., 2012; Liverant, Kamholz, Sloan, & Brown, 2011). Furthermore, rumination may serve as a misguided attempt for making sense of distressing emotions and circumstances (Vine, Aldao, & Nolen-Hoeksema, 2014). The style of thinking underlying rumination tends to keep people fixated on the past and can significantly undermine the ability to experience
mindfulness. Therefore, the construct of mindfulness, by definition represents a process and way of being that is incompatible with rumination. A considerable amount of research has revealed significant reductions in rumination upon participation in mindfulness-based intervention programs and observable increases across each of the five underlying facets of mindfulness as well as notable improvements in the ability to accept inner experiences (Ciesla et al., 2012; Ramel, Goldin, Carmona, & McQuaid, 2004; Raes & Williams, 2010; Segal, Williams, & Teasdale, 2002). Moreover, these skills correspond to the Five Factor Mindfulness Questionnaire (FFMQ) components of nonjudgment, acting with awareness, and acceptance, respectively.

Other studies have suggested that rumination and its subcomponents play a mediating role in the relationship between dispositional mindfulness and depression (Brown & Ryan, 2003; Ciesla et al., 2012; Marks, 2010). For instance, Raes and Williams (2010) found a negative correlation between mindfulness and the uncontrollability component of ruminative thinking. Furthermore, the correlation remained significant when controlling for current depressive symptomatology and prior history of depressive episodes. In line with this notion, Segal, Williams, and Teasdale (2002) suggested that continued practice of mindfulness could potentially reduce the self-perpetuating nature of ruminative thinking by increasing awareness of depressed mood and activation of ruminative responses. Furthermore, the increased awareness enables individuals to disengage from reactive ruminative tendencies before progressing to the stage of perceived uncontrollability. This type of awareness may in turn redirect the limited cognitive resources supporting rumination towards more active problem-solving thereby, leading to overall improvements in mood and psychological well-being (Raes & Williams, 2010; Segal et al. 2002).
Mindfulness and Loneliness. Vanhalst et al. (2012) indicated that rumination serves as a mediating variable in the relationship between loneliness and depressive symptoms within specific relational contexts. Increased practice of mindfulness appears to lead to a significant reduction in ruminative thinking over time that in turn gives rise to reductions in depressive symptomatology and improved mood (Raes & Williams, 2010). However, despite the compelling evidence indicating rumination as an underlying factor in the relationship between loneliness and depressive symptoms, there has not been extensive research on examining the effects of mindfulness on feelings of loneliness.

Creswell et al. (2012) exposed older adults in a treatment group to Mindfulness-based Stress Reduction (MBSR). The findings indicated that there was a significant reduction in self-reported loneliness in comparison to the wait-list control group. Furthermore, the study also identified changes in the pro-inflammatory gene expression in the treatment group, which is based. This randomized controlled trial is among the few studies that have explicitly examined the effects of mindfulness on subjective feelings of loneliness. Indeed, the results indicate that there is an underlying relationship between the two constructs. However, the study did not address the extent to which the presence of other psychological or emotional variables impacted the relation between mindfulness and loneliness. Moreover, the study was limited with respect to its relatively small sample size and emphasis on older adults. The authors also utilized MBSR, which has become the gold-standard approach for examining mindfulness in community samples. Although, MBSR has consistently demonstrated effectiveness for ameliorating distress across clinical populations, the intervention also emphasizes the practice of yoga, which by itself holds a unique relationship with mindfulness (Park, Braun, & Siegel, 2015). Therefore, it is difficult to ascertain whether the reductions in loneliness observed in the study were due to
changes in mindfulness experienced upon the practice of yoga or meditation. Another important consideration that was not addressed by Creswell et al. (2012) was the potential influence of depression on the observed changes in loneliness. Since both states frequently co-occur, it is difficult to determine whether the intervention had actually impacted the severity of depressive symptoms in the participants as opposed to residual change in loneliness.

The observed findings obtained by Creswell et al. (2012) and limitations of the study overall emphasize the need for additional research that delves into the relationship between mindfulness and loneliness in more depth. In order to increase the generalizability of the findings, it would be important to utilize a different mindfulness-based intervention and examine whether similar findings are established in a larger and more diverse population, where the experience of loneliness is likely to be ubiquitous. Recall that the practice of mindfulness has been found to significantly attenuate ruminative thinking, which has in turn been implicated in the exacerbation of loneliness. Therefore, it would be worthwhile to address the potential impact of this variable on the relationship between mindfulness and loneliness. Furthermore, it would be important to determine whether the practice of mindfulness is effective at targeting the underlying features of loneliness that distinguish it from theoretically and empirically linked constructs, namely depression. Thus, these concerns served as the basis for the present study.
The Present Study

The present study sought to bridge the gap in the empirical literature by providing a more concise explanation about the underlying relationship among mindfulness, ruminative thinking, and loneliness. The research was oriented towards determining the extent to which participation in a randomized-controlled trial of Unstress II facilitates improvements in mindfulness and corresponding reductions in feelings of loneliness and ruminative thinking. Three randomized wait-list control trials of Unstress II were conducted between the Spring 2015 and 2016 semesters, inclusive. Although the assessments of experimental and wait-list control groups occurred simultaneously, the control group’s intervention lagged one semester behind the experimental group’s intervention. Therefore, participants assigned to the wait-list control groups attended the intervention sessions alongside subsequent cohorts’ experimental participants. The present study consists of two independent variables: 1) the Unstress II intervention, which contains two levels: the treatment group and the wait-list control group; 2) the assessment time, which contains two levels: pre-assessment and post-assessment, respectively. The study’s dependent variables consists of mindfulness, ruminative thinking, and loneliness as operationally defined by the Five Facet Mindfulness Questionnaire (FFMQ), the Rumination Reflection Questionnaire (RRQ), and the revised UCLA Loneliness scale (R-UCLA), respectively. A residual variable of loneliness with depression parceled out was also incorporated into the present study in order to determine whether controlling for depression significantly impacted any of the findings. All the analyses testing the hypotheses about loneliness, were conducted twice: once with loneliness assessed with the R-UCLA and again with the residual variable of loneliness.
The current research has the potential to make the following unique contributions to the empirical literature:

1. Evidence for the applicability of mindfulness-based approaches for combating loneliness in addition to other forms of psychological distress.
2. A theoretical link between mindfulness, rumination, and loneliness.
3. Support for the utility of the Unstress II intervention

The present study investigated the following three hypotheses:

**Hypothesis 1.** Loneliness occurs due to the tendency to engage in ruminative thinking. Moreover, rumination was expected to mediate the observed relationship between mindfulness and loneliness. Based on the model delineated by Baron and Kinney (1986), mediation is likely to occur upon the satisfaction of four specific conditions:

1) Mindfulness, the independent variable (IV) was expected to significantly predict loneliness, the dependent variable (DV)
2) Mindfulness (IV) was expected to significantly predict rumination, the putative mediating variable (MV)
3) Rumination (MV) was expected to significantly predict loneliness
4) Upon controlling for the effect of rumination (MV), the observed relationship between mindfulness and loneliness would no longer be significant.

**Hypothesis 2.** The intervention was expected to confer increases in mindfulness and corresponding decreases in ruminative thinking and loneliness. In other words, participants in the experimental groups, but not in the wait-list control groups were expected to report increased changes in mindfulness and decreased rumination and loneliness from the pre- to post-intervention assessments.
**Hypothesis 3.** The efficacy of the intervention would be based on the extent that ruminative thinking was decreased via increased mindfulness of the intervention group. In other words, mindfulness was expected to serve as a mediator in the relationship between group membership and rumination. Based on Baron and Kinney (1986), the following relationships were originally hypothesized for the post-intervention assessment data.

1) The intervention group (IV) was expected to significantly predict decreases in rumination (DV)

2) The intervention group (IV) was expected to significantly predict increases in mindfulness, the putative mediating variable (MV)

3) Mindfulness (MV) was expected to significantly predict decreases in rumination (DV)

4) Upon controlling for the effect of mindfulness (MV), the relationship between participation in the intervention (IV) and ruminative thinking (DV) would no longer be significant
Method

Participants

Eighty-two (N = 82) individuals participated in the study from pre- to post-intervention, each of which was randomized into either the treatment (n = 56) or wait-list control group (n = 26). The participants were recruited for each of the controlled trials via flyers, advertisements, and announcements within the SUNY Brockport campus. Furthermore, the university’s online research participant pool was also utilized for recruitment purposes during the fall 2015 and spring 2016 semesters. The overall sample of participants consisted of eighty undergraduate students and two faculty members at the university. All participants were required to be at least eighteen-years of age in order to provide informed consent. The ages of the sample ranged from eighteen to sixty-three years (M = 21.68, SD = 6.48). There were sixty-one females and twenty males that participated in the study, with one individual preferring not to identify his or her gender. The study lost a considerable number of participants from pre- to post-intervention during each of the three trials. A total of forty-two participants withdrew from the spring 2015 trial, fourteen from the fall 2015 trial, and forty-six from the spring 2016 trial. There was a loss of one hundred and two participants throughout the duration of the study.

Participants in the study were ethnically diverse, with 74.4% identifying as Caucasian (n = 61), 1.2% as African (n = 1), 8.5% as African American (n = 7), 6.1% as Asian (n = 5), 2.4% as Asian American (n = 2), 1.2% as Caribbean/West Indian (n = 1), 4.9% as Latino or Hispanic (n = 4), 1.2% as Middle Eastern (n = 1). Among those who were students at the university, 22.5% identified as freshman (n = 18), 22.5% as sophomore (n = 18), 35% as junior (n = 28), 17.5% as senior or higher (n = 14), 2.5% as graduate (n = 2). The participants were also asked to specify their relationship status. Approximately 57.3% identified as single, widowed, or divorced (n = 47),
while 36.6% indicated being involved in a committed relationship, living together with or separately from their significant others at the time the study was conducted \((n=30)\). Among those who were married, 2.4% were living with their spouses \((n=2)\), while one participant was separated from his or her spouse.

**Procedures**

**Recruitment.** Notifications via e-mail were sent to all undergraduate students majoring and minoring in Psychology. An announcement was also posted in the Daily Eagle, a daily newspaper distributed to faculty and staff email accounts. Flyers were provided to the Hazen Counseling Center, Office for Students with Disabilities (OSD), the Transfer Experience Office, and Office for Student Retention (see Appendix A). Information about the intervention was given to those who expressed interest in participating. Potential participants were informed about the eligibility to receive $10 compensation for completing two assessment questionnaires, one prior to the intervention and another towards the end of the spring 2015 semester. Those who inquired about the study during the fall 2015 semester were informed about the option to receive either Psychology course credit for research participation or monetary compensation at the end of the semester as well as the eligibility to enter three, $100 drawings throughout the duration of the study. Those who expressed interest in participating in the study via email received a prompt reply that contained details about the Unstress II intervention including the format of the sessions, compensation for participation—cash for spring 2015 cohort, cash or research credit and the $100 drawings for the spring 2016 cohort, and a link with all the available scheduled assessment sessions.

**Assessment.** The intervention included two assessment sessions, a pre-intervention session and a post-intervention session. Although the two assessment sessions shared the same
battery of questionnaires, each contained procedures unique to the beginning and ending of the intervention.

**Pre-intervention Assessment Session.** An email reminder was sent to potential participants the night before each scheduled assessment session. A research assistant, referred as a group monitor during the intervention facilitated the assessment session and provided the participants with an availability calendar, an informed consent document, and assessment questionnaires. Instructions as well as a brief overview of Unstress II were given via a pre-recorded multimedia presentation facilitated by licensed clinical psychologist, Jeffery Snarr, Ph.D.

Participants were asked to randomly select a white index card containing a unique 3-digit identification number from a small metal box. Moreover, all participants were instructed to write their date of birth on the back of the card and draw a unique symbol so that they could retrieve their participant number should they need it at a later time. The informed consent, availability calendar, and assessment questionnaires were all completed with the identification number. The participants were also asked to provide their name, email address, and the third digit of their identification on a blue card, which was collected following the conclusion of the assessment session. Next, they were asked to identify three time slots that best fit their overall schedule on the availability calendar. This format ensures the confidentiality of the participants in the sense that it prevents the research team from linking the participant’s names to the identification numbers and data.

After the white cards, blue cards, and availability calendars were completed, participants were given an informed consent form to sign (see Appendix B). There were two different versions of the form. The first was given to the participants in the spring 2015 cohort and
indicated that they would receive up to $20 for the completion of two assessment sessions. The second was provided to participants in the fall 2015 semester and required them to specify whether they wish to receive either course credit or $20 compensation. Furthermore, this version informed the participants that they would be entered into three separate $100 drawings. By providing their signature, participants confirmed their awareness of the format of the program as well as their commitment to attend each of the sessions. The form also stated that should they decide to participate they would receive a notification about their group assignment for the semester. Upon completion of the first assessment session, participants were randomly assigned to receive the intervention either during the spring or fall semester.

**Post-intervention Assessment Session.** An email reminder was sent to participants in both the experimental group and the wait-list control group to sign up for an assessment session. A program feedback form was provided to those assigned to the former. Additional participants were asked to provide their permanent mailing address and complete W-9 forms in order to receive compensation for completion of the pre- and post-assessment sessions. Furthermore, wait-list control participants joined those in the experimental group and completed post intervention assessments. The $20 payment was dispersed via check and sent out during the summers of 2015 and 2016. Those in the fall 2015 and spring 2016 cohorts were also given the option to receive either credit for psychology research participation or monetary compensation.

**Assessment Questionnaires.** The participants were asked to complete a battery of self-report questionnaires towards the end of the pre- and post-intervention sessions. The selected questionnaires relevant to the present study are part of a larger set of measures administered to participants and a brief description of each is provided below.
**Demographic Questionnaire.** This questionnaire for the present study asked participants to provide basic demographic information including: participants’ age, gender, status at Brockport (e.g. student, faculty member), class standing (for undergraduate students), current relationship status (single, in a relationship, married, etc.) and racial background (see Appendix C). This questionnaire was only administered to participants in the pre-intervention assessment session.

**The Five-Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, Toney, 2006).** The FFMQ is a reliable and valid instrument that is often used to examine mindfulness. This 39-item, self-report instrument is based on a factor analytic study and the items on the FFMQ are rated on a scale from 1 (never or very rarely true) to 5 (very often or always true). The observe, describe, act with awareness, and non-judgment factors each correspond to 8 items while the non-reactivity factor corresponds to 7 items. The five factors yielded the following alpha values: nonreactivity=.75, observing=.83, acting with awareness=.87, describing=.91, and nonjudging=.87; demonstrating good internal consistency overall. For the most up to date version of the questionnaire, please see Appendix D.

**The Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999).** This self-report questionnaire consists of 24-items scored on a 5-point Likert scale. The overall frequency of ruminative and reflective tendencies is measured as follows: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. The questionnaire examines the individual disposition to engage in self-focused attention, described as attention directed towards an individual’s thoughts, feelings, and behaviors (Trapnell & Campbell, 1999). The first half of the questionnaire (item# 1-12) assesses ruminative tendencies while the second half (item#13-24) measures reflective tendencies, respectively. Items 6,9, and 10 on the rumination subscale and
items 13, 14, 17, 20, 24, and 25 on the reflection subscale are reverse scored. A mean score for each subscale is computed. Both self-rumination and self-reflection are based on the Five-factor model of personality. According to Trapnell and Campbell (1999), higher scores on the rumination subscale are believed to be indicative of higher levels of neuroticism and psychological distress. Conversely, higher scores on the reflection subscale are believed to indicate more openness to experience and psychological adjustment. This instrument has yielded high internal consistency for both rumination (Coefficient alpha= .90) and reflection (Coefficient alpha= .91). Furthermore, Trapnell and Campbell (1999) found that these two factors have exhibited minimal correlations with each other ($r = .22$) as both factors are conceptually incompatible with each other. For the purpose of the present study, only scores on the rumination subscale will be examined and included in the analyses (see Appendix E for a further description of each item).

*The Revised UCLA Loneliness Scale (R-UCLA; Russell, Peplau, & Cutrona, 1980).*

The UCLA scale is among the most widely used self-report instruments for measuring loneliness and contains 20 Likert-type items each of which are scored on a 4-point scale, ranging from 1 (never) to 4 (often). The original scale was developed for undergraduate students and all of the items were negatively worded (Russell, Peplau, & Ferguson, 1978). While the scale demonstrated high internal consistency (Coefficient $\alpha = .92$) and was found to be both a reliable and valid measure of loneliness, there was concern surrounding the potential for response bias inherent in having all of the items negatively worded. In order to address these concerns, Russell et al. (1980) developed the R-UCLA Loneliness Scale. The modified version includes 10 positively worded items and 10 negatively worded items that were originally selected from a pool of items that had the highest correlations with a set of questions that explicitly addressed
loneliness (Russell et al., 1980). The R-UCLA has yielded high internal consistency (Coefficient $\alpha = .94$) overall (Russell, 1996). Please refer to Appendix F for further description of each item on the R-UCLA.

The current research was part of a large-scale study and the self-report measures previously described were among the many that were administered to participants. Empirically validated questionnaires oriented towards measuring constructs pertinent to perceived stress, relationship satisfaction, anxiety, and depression, among others were utilized for the additional research beyond the scope of the present study. Recall that the considerable overlap between loneliness and depression has previously thwarted attempts to measure loneliness as a distinct psychological construct. In order to address this issue, scores on the depression subscale of the Depression Anxiety Stress Scales (DASS), originally developed by Lovibond and Lovibond (1995), were utilized for the purpose of creating a residual variable of loneliness devoid from its association with depression (See Appendix G for a version of the scale).

**The Intervention.** The program consisted of 8-weekly sessions, each of which lasted no more than 60 minutes. Prior to each scheduled session, emails were sent out to all participants in the treatment group reminding them to attend the session. Details about the date, time, and location for the sessions were also provided. Upon arrival, each participant was asked to draw from a group of numbered cards. Based on the number selected, they were then divided into small groups consisting of 3 to 4 participants, each.

During each of the sessions, a group monitor played a professional videotaped recording of the licensed clinical psychologist that facilitated the group by leading the discussions and teaching the skills. Handouts for specific skills/topics covered during each session were dispersed to the participants at specific intervals during the recording. Homework was assigned
upon the conclusion of each session. The assignments were designed to reinforce and master the skills and exercises taught during the session. In order to keep track of attendance, participants who attended each scheduled session were asked to provide their name, email address, and identification number on a small blue slip of paper that was collected at the end of the session. Participants were asked to complete a feedback form and provide detailed responses to questions about the homework assignments, topics/skills covered, and session. Finally, group monitors sent emails attached with the homework assignments and reminders for those who missed any of the program sessions. A brief overview of each of the intervention sessions is provided below (See Appendix H for a detailed description):

**Session 1.** The core mindfulness skills of ACT were introduced. Participants were taught the concept of “the watcher” and the “Hexaflexercise”, a focused-attention (FA) deep-breathing meditation exercise.

**Session 2.** The concept of core values was discussed as well as the distinction between goals and values.

**Session 3.** The topic of “creative hopelessness” was discussed including a definition. Participants learned about the hidden costs associated with avoidance behaviors and the possibilities for positive change involved with disengagement from unhelpful patterns of behavior. The first $100 drawing was conducted and the participant selected was informed via email.

**Session 4.** The concept of “defusion” was introduced. Defusion skills taught included the “leaves on a stream exercise”.

**Session 5.** The concept of “acceptance of emotions” was introduced and acceptance skills were taught, specifically the “healing hand” exercise.
Session 6. Participants were introduced to the concept of “being in the moment” and the topic of values was revisited. The second $100 drawing was conducted and the participant selected was informed via email.

Session 7. SMART goals, as defined by ACT, were taught and participants were asked to use the approach to identify their own personal goals. Each participant completed a SMART goals worksheet.

Session 8. Participants were asked to discuss their personal progress towards SMART goals and ways to address barriers to achievement. The FEAR and DARE acronyms were also taught. The third and final $100 drawing was conducted and the selected participant was informed via email.
Results

The data from the pre- and post-intervention questionnaires were obtained for both groups and entered into SPSS. Prior to analysis, all responses were screened for accuracy of data entry and missing values. Furthermore, reliability checks were performed for each item on all the self-report questionnaires administered to participants at both assessment times.

Hypothesis 1. In order to determine whether ruminative thinking played a mediating role in the relationship between mindfulness and loneliness, a series of multiple regression analyses were conducted for both Time 1, the pre-intervention phase and Time 2, the post-intervention phase, respectively. This hypothesis was investigated upon strict adherence to the guidelines for full mediation originally outlined by Baron and Kenny (1986). Two sets of four standardized regression equations were analyzed, one set for each assessment time. The following is a description of each step of the mediational analysis:

1) Loneliness (DV) was regressed onto mindfulness (IV).

2) Rumination (MV) was regressed onto mindfulness (IV).

3) Loneliness was regressed onto rumination (MV).

4) Loneliness (DV) was once again regressed onto mindfulness (IV), with rumination being entered into the regression equation first.

In order to account for the effect of depression, the analysis was conducted again with the standardized residual variable obtained from regressing the Revised-UCLA loneliness scale scores on the depression subscale scores of the DASS for both assessment times.

Pre-intervention (Time 1). The regression analyses indicated the presence of partial mediation. For a further description of the mediational analysis, please refer to Figure 1a. The prerequisite conditions for mediation established by Baron and Kenny (1986) were met in the
expected directions. In the first step of the aforementioned mediation model, the regression of loneliness scale scores on mindfulness total scores was revealed to be significant ($R^2 \Delta = .24, \beta = -.49, F(1,80) = 25.36, p < .001$). The second step of the model revealed that mindfulness significantly predicted ruminative thinking ($R^2 \Delta = .32, \beta = -.56, F(1,80) = 36.72, p < .001$).

The third step of the statistical analysis indicated that ruminative thinking significantly predicted loneliness ($R^2 \Delta = .20, \beta = .25, F(1,80) = 19.81, p < .05$). Since the findings obtained from the first three steps of the mediation process were significant, the analysis was able to progress to the fourth and final step. The relationship between mindfulness and loneliness remained significant, despite controlling for the effect of ruminative thinking ($R^2 \Delta = .09, \beta = -.35, F(2,79) = 15.59, p < .01$). The overall values of the $R^2 \Delta$ and $\beta$ decreased, which consequentially resulted in reduced significance. Therefore, the findings were indicative of a partial mediating effect of ruminative thinking in the relationship between mindfulness and loneliness at Time 1.

Due to the considerable overlap between loneliness and depression, the mediation model outlined above was tested once again with a residual variable of loneliness free from the potential impact of depression. The R-UCLA scores were regressed onto the DASS depression subscale scores. The regression analysis confirmed that depression significantly predicted loneliness ($R^2 \Delta = .29, \beta = .54, F(1,80) = 33.55, p < .001$). The corresponding standardized residual variable of loneliness was then saved and served as the dependent variable for the remainder of the analysis. However, the pre-requisite relationships for mediation were not observed. Mindfulness was found to significantly predict residual loneliness ($R^2 \Delta = .09, \beta = -.30, F(1,80) = 7.99, p < .01$) and remained a significant predictor of rumination ($R^2 \Delta = .32, \beta = -.56, F(1,80) = 36.72, p < .001$). However, the third step of the analysis was not fulfilled as rumination failed to significantly predict the residual loneliness ($R^2 \Delta = .03, \beta = .01, F(1,80) = \ldots$
2.55, \( p = .94 \)). The analysis could not progress any further as the criterion for mediation was not fulfilled. These findings suggest that the partial mediation previously established at Time 1 was lost when loneliness was devoid of depression.

**Post-intervention (Time 2).** This phase of the analysis adhered to the same protocols for mediation as Time 1 according to the guidelines outlined by Baron and Kenny (1986). The regression analysis revealed that mindfulness significantly predicted loneliness \( (R^2 \Delta = .25, \beta = -.50, F (1, 80) = 26.32, p < .001) \). The second step of the mediation process indicated a statistically significant relationship between mindfulness and rumination \( (R^2 \Delta = .17, \beta = -.41, F (1, 80) = 16.10, p < .001) \). Moreover, the regression of rumination was also significant \( (R^2 \Delta = .16, \beta = .23, F (1, 80) = 14.65, p < .05) \). The final step of the analysis revealed that mindfulness remained a significant predictor of loneliness, in spite of controlling for the effect of ruminative thinking, \( (R^2 \Delta = .14, \beta = -.40, F (2, 79) = 16.20, p < .001) \). In line with the findings obtained from the analysis at Time 1, rumination partially mediated the relationship between mindfulness and loneliness at Time 2. Although the significance levels did not decrease appreciably, reductions in the \( \beta \) and \( R^2 \Delta \) values were observed. Further analysis is warranted in order to determine if the decrease was substantial enough to establish partial mediation. For a further description of the mediational analysis, please refer to Figure 1b.

Once again the analysis was repeated with the residual variable of loneliness. The regression of depression on loneliness at Time 2 was significant, \( (R^2 \Delta = .22, \beta = .47, F (1, 80) = 22.489, p < .001) \). Mindfulness remained a significant predictor of both residual loneliness \( (R^2 \Delta = .12, \beta = -.34, F (1, 80) = 10.45, p < .01) \) and ruminative thinking \( (R^2 \Delta = .17, \beta = -.41, F (1, 80) = 16.10, p < .001) \). Rumination continued to significantly predict loneliness \( (R^2 \Delta = .12, \beta = .24, F (1, 80) = 10.40, p < .05) \). The final step of the analysis revealed that mindfulness remained a
significant predictor of loneliness upon controlling for ruminative thinking ($R^2 \Delta = .05$, $\beta = -.24$, $F (2, 79) = 7.73, p < .05$). A reduction in the previously established significance was observed and the mediation analysis indicated that ruminative thinking partially mediated the relationship between mindfulness and loneliness at Time 2 upon controlling for self-reported levels of depressive symptoms.

**Hypothesis 2.** A 2 (Group; Treatment, Wait-list Control) x 2 (Time; Pre-intervention, Post-intervention) repeated measures Multivariate Analysis of Variance (MANOVA) was implemented in order to test whether the Unstress II intervention conferred statistically significant increases in mindfulness alongside reductions in ruminative thinking and feelings of loneliness. For the purpose of the analysis, group membership served as the *between*-subjects factor while the assessment time from pre- to post-intervention served as the *within*-subjects factor. Mindfulness, ruminative thinking, and loneliness remained dependent variables throughout the analysis.

As originally predicted, the interaction effect between Group and Time on the combined dependent measures was statistically significant, $F (3,78) = 5.73, p = .001$; Wilks’ $\Lambda = .82$. The results also revealed a significant main effect of Time, $F (3,78) = 7.89, p < .001$; Wilks’ $\Lambda = .77$. However, no main effect of group was established, $F (3,78) = 1.07, p = .37$; Wilks’ $\Lambda = .96$. Follow-up univariate testing went on to reveal a significant Group by Time interaction for each of the three dependent variables (mindfulness, $F (1, 80) = 5.43, p < .05$; ruminative thinking, $F (1,80) = 10.34, p < .01$; loneliness, $F (1,80) = 13.93, p < .001$) in the predicted directions. A graphical representation of the findings is outlined in Figure 3. A main effect of Time was established for mindfulness, $F (1, 80) = 8.58, p < .001$ in addition to ruminative thinking, $F (1, 80) = 18.31, p < .001$ and loneliness, $F (1,80) = 14.33, p < .001$. The findings indicated a trend
towards significance for the main effect of group on mindfulness, \( F(1, 80) = 3.28, p = .074 \).

However, there was no main effect of Group established for ruminative thinking, \( F(1, 80) = .68, p = .41 \) and loneliness, \( F(1, 80) = .41, p = .41 \).

The MANOVA was conducted once again with the residual variable of loneliness. The overall Group by Time interaction remained significant, \( F(3,80) = 5.41, p < .01 \). Upon inspection of the findings derived from the univariate testing, the Group by Time interaction for residual loneliness was also significant, \( F(1, 80) = 8.87, p < .01 \). However, the main effect of Time on residual loneliness differed drastically from the previous findings and was no longer statistically significant, \( F(1, 80) = 1.19, p = .28 \).

**Hypothesis 3.** The intervention was aimed at increasing mindfulness and in the process decrease ruminative thinking and loneliness. The first hypothesis examined the degree to which ruminative thinking mediated the relationship between mindfulness and loneliness at both Time 1 and Time 2. Conversely, the third hypothesis asserts that mindfulness would play a mediating role in the relationship between group membership and ruminative thinking, specifically at Time 2. As with hypothesis 1, this hypothesis employed a series of four regression equations as delineated by Baron and Kenny (1986). Each step of the analysis was conducted as followed:

1) Rumination (DV) was regressed onto group membership (IV).

2) Mindfulness (MV) was regressed onto group membership (IV).

3) Rumination (DV) was regressed onto Mindfulness (MV)

4) Rumination (DV) was regressed onto both group membership (IV) and mindfulness (MV), with mindfulness being entered into the regression equation first.

At Time 2, group membership was found to significantly predict ruminative thinking \( (R^2 \Delta = .06, \beta = -.24, F(1, 80) = 4.17, p < .05) \). Group membership was also found to significantly
predict mindfulness ($R^2 \Delta = .08$, $\beta = .29$, $F (1, 80) = 7.31, p < .01$). The relationship between mindfulness and ruminative thinking was statistically significant ($R^2 \Delta = .7$, $\beta = -.37$, $F (1, 80) = 16.01, p < .001$). The final step of the analysis indicated that upon controlling for the effect of mindfulness, the relationship between group membership and ruminative thinking was no longer significant ($R^2 \Delta = .02$, $\beta = -.13$, $F (2, 79) = 8.90, p = .21$). The overall findings of the analyses support the hypothesis that improvements in mindfulness fully mediate the relationship between participation in the intervention and corresponding reductions in ruminative thinking. A path analysis diagram is located in Figure 2.
Discussion

Mindfulness and loneliness have each been extensively studied across psychological research. Yet, very little research has explicitly examined the relationship between both constructs. Thus, the primary goal underlying the present study was to bridge this gap. Prior research has highlighted the complex nature of the change process underlying the practice of mindfulness. Several potential mechanisms have been proposed in an attempt to explain the ways by which mindfulness attenuates psychological distress. The majority of these mechanisms emphasize the modulation of attention and role of cognitive mediators. One potential mediator may be decreases in ruminative thinking, which has been implicated in chronic and prolonged feelings of loneliness. In line with this rationale, changes in mindfulness would likely impact ruminative thinking and in the process, exert an effect on loneliness. The present study examined the effects of a mindfulness-based intervention on changes in mindfulness, ruminative thinking, and loneliness. Three distinct yet, interrelated hypotheses were investigated. Due to the overlap between loneliness and depression, it was important to examine whether the statistical findings would be replicated with a residual variable of loneliness devoid of the shared variance with depression.

The first hypothesis investigated the mediating role of ruminative thinking in the relationship between mindfulness and loneliness at both assessment times, pre-intervention (Time 1) and post-intervention (Time 2). The results revealed that mindfulness continued to significantly predict loneliness despite controlling for the effect of ruminative thinking at both times. Furthermore, the overall findings obtained from the analyses suggest that mindfulness may operate on loneliness both directly and indirectly through ruminative thinking, which is strongly indicative of partial rather than full mediation. Furthermore, it is quite possible that
many other cognitive mediators affected the observed relationship aside from rumination, as
mindfulness is likely to transmit its effects via multiple pathways including variables pertinent to
personality, mood, and cognition (Bishop et al., 2004; Davis & Hayes, 2011; Zeidan & Vago,
2016). Although the results of this hypothesis could be due to a simple direct effect, future
research may benefit from attempting to glean insight into the underlying mechanisms that give
rise to the relationship between mindfulness and loneliness.

Furthermore, it is important to note that rumination failed to serve as a significant
predictor of residual loneliness at Time 1 and the partial mediation originally established was no
longer supported. Rumination is linked to depressed mood, which in turn frequently co-occurs
alongside loneliness (Nolen-Hoeksema, 1991; Russell, 1996; Vanhalst et al., 2012; Weeks et al.,
1980). The influence of depression may have been more prominent at Time 1 as opposed to
Time 2. The type of thought patterns underlying rumination may have been more strongly
associated with depressive symptoms than loneliness at the pre-intervention assessment. As
noted by Vanhalst et al. (2012), the extent to which ruminative thought patterns were endorsed as
being uncontrollable in nature was found to provoke depressive symptoms and in the process,
intensify feelings of loneliness in a sample of college freshmen. Additional research should
examine the type of thought patterns underlying ruminative thinking that in turn give rise to the
relationship between depression and loneliness.

The second hypothesis emphasized that the intervention would be effective at increasing
mindfulness while simultaneously decreasing ruminative thinking and loneliness. As predicted,
the treatment group reported significantly higher levels of mindfulness and endorsed lower levels
of ruminative thinking and loneliness from Time 1 to Time 2 in comparison to the wait-list
control group. The Group by Time interaction originally established for loneliness remained
significant when statistically controlling for depression. This suggests that participation in the intervention may have successfully targeted the underlying features that distinguish loneliness from depression. The results across both assessment times are consistent with the reductions in loneliness initially found by Creswell et al. (2012). However, the present study extends further by including rumination and examining the effect of loneliness isolated from depression, which had not been addressed by the authors. Another important implication from these findings is that the observed changes in loneliness were not exclusive to the specific type of mindfulness-based intervention employed. Creswell et al. (2012) implemented the Mindfulness-based Stress Reduction (MBSR) program that emphasizes the practice of meditation exercises and yoga, the latter of which has been found to exert the benefits of mindfulness on its own (Park, Riley, Bedesin, & Stewart, 2016; Riley & Park, 2015). Therefore, it is difficult to ascertain whether the reductions in loneliness were dependent on the practice of mindfulness woven into the meditation exercises or yoga techniques. Conversely, the Unstress II intervention utilized for the present study integrates mindfulness exercises and techniques drawn primarily from the realm of Acceptance and Commitment Therapy (ACT). The findings suggest that different approaches for integrating mindfulness into therapeutic interventions may be effective at reducing loneliness and contribute to the growing body of literature surrounding the ACT framework.

The third and final hypothesis of the present study was concerned with examining whether participation in the intervention and the corresponding reductions in ruminative thinking observed were mediated by improvements in mindfulness. The results revealed that controlling for the presence of mindfulness, the putative mediating variable, attenuated the previously significant effect of the intervention on rumination to the extent that the relationship was nonsignificant, which is indicative of full mediation according to the Baron and Kenny (1986)
approach. An important direction for future research would be to examine whether the other mindfulness-based interventions that currently exist operate in a similar manner. Mindfulness represents a heightened sense of awareness and attention supported by a stance of nonjudgmental openness, acceptance, and curiosity, which is by definition incompatible with rumination. Therefore, the observed findings are consistent with the existing literature linking reductions in ruminative thinking with the consistent practice of mindfulness (Lynn, Barnes, Deming, & Accardi, 2010; Petrocchi & Ottaviani, 2016; Remmers, Topolinski, & Koole, 2016; Selby, Fehling, Panza, & Kranzler, 2016). Furthermore, the mindfulness exercises taught in the treatment group place an emphasis on what is occurring, felt, or thought within the present moment as opposed to what was, might be, could be, or should have been (Hayes et al., 1996; Hayes, 2016). As such, those who participated in the intervention may have been discouraged from engaging in ruminative thinking upon gradually experiencing the benefits of mindfulness accrued throughout the treatment sessions.

The current findings contribute to the growing body of empirical literature surrounding the transformative benefits of mindfulness. However, the present study transcends the confines of previous research by investigating mindfulness in relation to both ruminative thinking and loneliness. These findings interpreted collectively lend support towards the utility of mindfulness-based interventions for combating loneliness in addition to other forms of psychological and emotional distress. Furthermore, the current research is among the first to examine and demonstrate the effectiveness of Unstress II. It is important to note that in comparison to other empirically validated interventions, Unstress II adopts a model that is based in part on the structure of peer-moderated group therapy involving the use of theoretically oriented exercises that can be administered by both professionals and paraprofessionals alike.
Thus, there is a strong emphasis on the insight and support provided by group participants in facilitating change rather than the role of treatment providers. Despite the potential to significantly impact multiple dimensions of psychological health and well-being, few studies have examined the efficacy of peer-led treatment programs. Future research should explore whether other therapeutic interventions such as Dialectical Behavior Therapy (DBT) and Mindfulness-based Cognitive Therapy (MBCT) remain effective when adapted to fit a peer-facilitated model. Another important consideration that arises from the findings is that the mere presence of others may have been sufficient for reducing loneliness for participants in the treatment group rather than the mindfulness techniques taught throughout the duration of the intervention. This issue might be rectified in future research through increased facilitation of guided meditation exercises throughout the intervention sessions. Overall, the observed findings support the dissemination of Unstress II for ameliorating distress in diverse community samples and most importantly, fostering positive change.

There are also important theoretical implications for the study of loneliness. In the past, it was assumed that loneliness represented an underlying feature of the more clinically significant issue of depression (Peplau & Perlman, 1978; Russell, Cutrona, & Peplau, 1980). However, the present study revealed that the impact of the mindfulness intervention on residual change in loneliness was maintained even when self-reported levels of depressive symptoms were statistically controlled, suggesting that this relation was not due to the presence of depression. Another important consideration is that loneliness has been both theoretically and empirically linked to additional psychological constructs such as anxiety, hostility, and self-esteem, which was not accounted for by the current research (Cacioppo & Patrick, 2008; Peplau & Perlman, 1978; Russell, 1996; Weeks et al., 1980). Additional research should examine whether similar
findings are obtained upon parceling out the influence of each of these variables. Since loneliness is also associated with various forms of psychopathology, it might also be important to examine whether the corresponding reductions that occur upon intervention efforts are dependent on changes in symptom severity.

Baer et al. (2006) conceptualized mindfulness as a multidimensional construct and suggested that it should be examined in relation to the five underlying facets (observe, describe, act with awareness, non-judgment, and non-reactivity) established as they have each been found to tap into the state, trait, and skill components of mindfulness differently. However, the present study measured mindfulness from a unidimensional perspective based on the total scores obtained from the Five-facet Mindfulness Questionnaire (FFMQ). Therefore, it is quite possible that each of the facets may have a separate relationship with both rumination and loneliness. Future research might benefit from determining which facet or facets were more susceptible to the effects of the intervention. This approach might provide additional insight into the nature of the findings. The exercises drawn from the ACT model emphasize the observation of inner experiences and thus, appears closely aligned with the observe facet, which has also been found to be highly susceptible to the practice of meditation (Baer et al., 2008). Perhaps, the changes in self-reported levels of mindfulness from pre- to post- might have been due to the impact of this facet. These efforts would continue to enhance the understanding about the mindfulness construct and potentially provide insight for practitioners and researchers alike about the factors that facilitate or forestall the benefits of mindfulness.

The current research examined the mediating role of ruminative thinking in the relationship between mindfulness and loneliness. Although the findings at both Time 1 and Time 2 partially supported the expected findings, there is a possibility that rumination also serves as a
moderator in the relationship between the two variables, which was not addressed in the current research. For instance, Vanhalst et al. (2012) found that ruminative thinking moderates the relationship between depressive symptoms and parent-related loneliness in college student samples. In this respect, rumination may enhance the effect, attenuate the strength, or change the direction of the observed relationship between mindfulness and loneliness. Furthermore, it is possible that lower levels of mindfulness may lead to heightened feelings of loneliness in individuals who frequently engage in ruminative thinking but may be unrelated to loneliness for those who do not ruminate. Therefore, additional research may benefit from examining rumination from the perspective of a moderating variable.

There are a number of strengths emphasized by the present study including its randomized controlled design and recruitment protocols. Moreover, the intervention employed was based on empirically supported research and administered upon strict adherence to the ethical guidelines set forth by The College at Brockport. In spite of these strengths, however, some limitations of the current study must be noted, as they may be better addressed in future research. One such limitation is the focus on a sample that predominantly consisted of college students. Therefore, it is difficult to ascertain whether the findings would generalize to a more impaired and demanding clinical population. It is important to note that the current research depended heavily on scores obtained from self-report questionnaires of mindfulness, rumination, and loneliness, which may have been vulnerable to recall or response bias. However, this limitation may provide insight into the utility of developing multi-method assessments of each construct such as structured interviews, observer reports, and computer based assessments in order to more confidently rule out the potential impact of common-method variance. Additionally, qualitative approaches may also be useful for attempting to glean a deeper
understanding about the phenomenology and subjective nature of mindfulness, rumination, and loneliness both individually and collectively. Another limitation evident in the present study is the overall rate of attrition, which poses a potential threat towards the internal validity. Many participants withdrew from the study and failed to return for the post-intervention assessment. As such there was an uneven distribution of participants across both the treatment and wait-list control groups. Furthermore, inconsistent attendance in the treatment group was also an issue in the present study, which was rectified by consistently sending email reminders to participants prior to each scheduled session in addition to emails for those who had missed any of the intervention sessions with a broad overview of what was covered. Furthermore, the expectation of or hope for improvement by itself could have played a role in the changes observed across the dependent variables for those who remained in the treatment group. Future research should attempt to mitigate these issues in order to strengthen the validity of the findings.

Loneliness is a distressing experience that is very much entrenched within the human condition. Many experience transient and short-lived feelings of loneliness that eventually dissipates. Unfortunately, the experience tends to be chronic and prolonged for a significant proportion of the human population. The present study illuminates the importance of studying loneliness and the potential to reduce the severity of the experience through intervention efforts, specifically those that emphasize the practice of mindfulness. Furthermore, the current study developed a clear theoretical link about the underlying relationship between mindfulness and loneliness by examining the role of ruminative thinking. When lonely individuals engage in ruminative thinking, they are likely to compulsively fixate on the causes of the experience in order to make sense of their circumstances, which can considerably undermine their ability to forge and maintain meaningful social connections. The practice of mindfulness generates a sense
of acceptance and compassion towards the self that thereby enables people to feel closer to others. Indeed, the gradual alleviations in feelings of loneliness that arise upon cultivating mindfulness across everyday life are only among the many benefits of living in the present moment.
References


EFFECTS OF A MINDFULNESS-BASED INTERVENTION


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EFFECTS OF A MINDFULNESS-BASED INTERVENTION


Tops, M., Boksem, M. S., Quirin, M., IJzerman, H., & Koole, S. L. (2014). Internally directed cognition and mindfulness: An integrative perspective derived from predictive and reactive control systems theory. *Frontiers in Psychology, 5*


Table 1
*Age, Mindfulness, Rumination, and Loneliness by group and time*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Treatment Group (N=56)</th>
<th>Wait-list Control Group (N=26)</th>
<th>95% CI</th>
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<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>Upper (Lower)</td>
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<tr>
<td>Age</td>
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<td>19.96 (2.72)</td>
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<tr>
<td>Mindfulness T1</td>
<td>115.77 (13.16)</td>
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<td>116.85 (123.26)</td>
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<td>3.62 (.86)</td>
<td>3.52 (3.90)</td>
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<tr>
<td>Rumination T2</td>
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<td>3.50 (.83)</td>
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<td>-.02 (.94)</td>
<td>.37 (-.42)</td>
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<tr>
<td>R. Loneliness T2</td>
<td>-.17 (.87)</td>
<td>.37 (1.15)</td>
<td>.09 (-.43)</td>
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</table>

*Note. R. Loneliness pertains to the residual variable of loneliness obtained upon controlling for the shared variance associated with depression.*
Figure 1a. The mediating role of ruminative thinking in the relationship between mindfulness and loneliness at pre-intervention (Time 1)

\[ R^2_\Delta = 0.32 \]
\[ \beta = -0.56^{***} \]

Rumination
RRQ Ruminations Mean Scores

Mindfulness
FFMQ Total Scores

Loneliness
R-UCLA Total Scores

\[ R^2_\Delta = 0.20^{*} \]
\[ \beta = 0.25^{*} \]

Note. The \( \beta \)'s and \( R^2_\Delta \)'s are provided for each of the variables. The corresponding values upon controlling for the effect of the putative mediating variable are provided in parentheses.

*  \( p < .05 \)
**  \( p < .01 \)
***  \( p < .001 \)

Figure 1c. The mediating role of ruminative thinking in the relationship between mindfulness and residual loneliness (Time 1)

\[ R^2_\Delta = 0.32^{***} \]
\[ \beta = -0.56^{***} \]

Rumination
RRQ Ruminations Mean Scores

Mindfulness
FFMQ Total Scores

Residual Loneliness
R-UCLA-DASS-D Total Scores

\[ R^2_\Delta = 0.09^{**} \]
\[ \beta = -0.30^{**} \]

Note. The \( \beta \)'s and \( R^2_\Delta \)'s are provided for each of the variables.

*  \( p < .05 \)
**  \( p < .01 \)
***  \( p < .001 \)
**Figure 1b.** The mediating role of ruminative thinking in the relationship between mindfulness and loneliness at post-intervention (Time 2)

\[ R^2_\Delta = .17^{***} \]
\[ \beta = -.41^{***} \]

\[ R^2_\Delta = .16^* \]
\[ \beta = .23^* \]

**Note.** The \( \beta \)'s and \( R^2 \)'s are provided for each of the variables. The corresponding values upon controlling for the effect of the putative mediating variable are provided in parentheses.

* \( p < .05 \)
*** \( p < .001 \)

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**Figure 1d.** The mediating role of ruminative thinking in the relationship between mindfulness and residual loneliness (Time 2)

\[ R^2_\Delta = .17^{***} \]
\[ \beta = -.41^{***} \]

\[ R^2_\Delta = .12^{**} \]
\[ \beta = .34^{**} \]

\[ R^2_\Delta = .12^{**}(0.05^*) \]
\[ \beta = -.34^{**}(0.24^*) \]

**Note.** The \( \beta \)'s and \( R^2 \)'s are provided for each of the variables. The corresponding values upon controlling for the effect of the putative mediating variable are provided in parentheses.

* \( p < .05 \)
** \( p < .01 \)
*** \( p < .001 \)
Figure 2. The mediating role of mindfulness in the relationship between group membership and ruminative thinking from pre- to post-intervention

Note. The β’s and $R^2\Delta$’s are provided for each variable. The corresponding values upon controlling for the putative mediating variable are provided in parenthesis.

* $p<.05$
** $p <.01$
*** $p<.001$
Figure 3a. Group by Time interaction for Mindfulness $F(1,80) = 5.43, p < .05$

![Mindfulness Graph]

Figure 3b. Group by Time interaction for Rumination, $F(1,80) = 10.34, p < .01$

![Rumination Graph]
**Figure 3c.** Group by Time interaction for Loneliness, \( F(1,80) = 13.93, p < .001 \)

**Figure 3d.** Group by Time interaction for Residual Loneliness with Depression parcelled out, \( F(1,80) = 8.87, p < .01 \).
Stressed Out?

We are testing a new, mindfulness-based stress reduction program that might help.

Participants will also receive up to $20 and can earn entries into up to three drawings for $100 each.

Please email for more information.
Appendix B

Statement of Informed Consent

STATEMENT OF INFORMED CONSENT

The purpose of this research project—to be conducted at The College at Brockport, State University of New York—is to perform a randomized, controlled trial of Unstress II, a new stress management program that involves the teaching and learning of mindfulness skills intended to help participants cope better with stress and lead more fulfilling lives.

In order to participate in this study, your informed consent is required. You were selected for potential participation based on:
(a) Expression of willingness to participate
(b) Availability at the time the study is being conducted.

Now, you are being asked to make a decision as to whether or not to actually participate in the project. If you want to participate in the project, and agree with the statements below, please sign your name in the space provided at the end.

You may change your mind at any time and leave the study without penalty, even after the study has begun.

I understand that:

1. My participation is voluntary and I have the right to refuse to answer any questions.
2. The confidentiality of my written data is protected. My name will not be written on any data questionnaires. There will be no way to connect my name to my written responses. If any publication(s) result from this research, I will not be identified by name.
3. It is anticipated and hoped that participation in this program will provide me with skills that will enable me to better handle stress and live a more fulfilling life. There are some risks, however. Because many of the program’s activities involve thinking about and discussing internal and external stressors and challenges, participation may lead to some emotional and/or mental discomfort. Also, Unstress is conducted in a group setting, and the researchers cannot guarantee that the other participants will respect or protect the confidentiality of any statements I make to or information I share with them. Therefore, I should not disclose anything during sessions that could cause me harm should it become known to others inside or outside the program.
4. Just as would be the case in a clinical treatment setting, there are legal limits to confidentiality. If the researchers discover that (a) a child is being abused, (b) that I am planning to seriously harm or kill myself, or (c) that I am planning to seriously harm or kill someone else, they will notify the primary researcher, who will break confidentiality and notify the necessary authorities. I will not be asked directly about these topics, but if I choose to share this information, action will be taken.
5. Although the skills taught by the Unstress program are also taught by many professional therapists, Unstress itself is not therapy and has not been designed to treat psychological
disorders. Therefore, anyone experiencing significant distress or dysfunction prior to or resulting from participation is encouraged to seek professional help in addition to or instead of Unstress participation. For example, the College Counseling Center (585-395-2207) schedules appointments 8 a.m.–4:45 p.m., with walk-in hours 8–11 a.m. Mon.-Fri. You may also consider calling Lifeline (585-275-5151 or 2-1-1), a 24/7 mental health talk line.

6. Including the initial session at which I received this consent form, my participation involves attendance at two assessment sessions, each lasting no more than 60 minutes. At each of these sessions, I will complete written questionnaires regarding my functioning in daily life; these questionnaires contain a total of 188 questions. These sessions will be held at the beginning and end of the [current] semester.

7. My participation also involves attendance at eight stress management training sessions, which will generally be held weekly once the program begins. Each session will last no more than 60 minutes. As part of sessions two through eight, I will complete written questionnaires that asks about completion of homework and/or practice of skills assigned at the previous session; I will also be asked to provide written feedback about the session I just completed. As part of session eight, I will also be asked to provide written feedback regarding the program as a whole.

8. Approximately 200 people will take part in this randomized controlled trial, with 100 beginning the trial in Fall 2015 and 100 beginning the trial in Spring 2016. Each of us who is joining the trial in [current semester] will be randomly assigned to attend the stress management sessions during either the [current] or [next] semesters. Although I can choose to leave the study at any time, I cannot choose to participate in Unstress II during a semester other than the one to which I was randomly assigned.

9. The results of this study will be used by the primary researcher to assess the effectiveness of the program.

10. Data will be kept in a locked laboratory by the investigator. Data and consent forms will be destroyed by shredding when the research has been accepted and approved.

11. In addition to the potential benefits of the stress management program itself, I will receive one of two forms of compensation in exchange for my participation:

   a) **If I am not currently a student in PSH 110**, I will receive $5 for completing today’s assessment and $15 for completing the longer second assessment, for a total of $20. In addition, for every three sessions I attend—including today’s assessment session—I will receive one entry into a drawing for $100 (up to 3 entries total). Three names will be drawn at the end of each semester, and if my name is drawn multiple times, I can win multiple times. However, I can only win during the semester when I was assigned to attend the Unstress sessions.

   b) If I am currently a student in PSH 110, I can choose to be paid as described above, OR I can choose to receive PSH 110 research participation credits instead. How many credits I can receive will depend on the random assignment results:

   **If I am assigned to attend the Unstress sessions during [current semester]**, I will receive 1 participation credit for each assessment session I complete (up to 2 total). I will also earn 1 more credit for every three Unstress sessions I attend (up to 2 additional credits for attending 6 of 8 possible sessions). If I attend all 8 sessions, my PSH 110 instructor may offer me extra credit at her/his discretion.
If I am assigned to attend the Unstress sessions during [next semester]—which will be after my PSH 110 course is complete—I will receive participation credit for each assessment session I complete this semester (up to 2 total). Next semester, if I choose to attend the Unstress sessions, I can earn up to 3 entries into the $100 drawings, as described above.

I am 18 years of age or older. I have read and understand the above statements. All my questions about my participation in this study have been answered to my satisfaction. I plan to be in the Brockport area during both the Spring 2015 and Fall 2015 semesters. I also agree to be randomly assigned as detailed above. I agree to participate in the study, realizing I may withdraw without penalty at any time during the process. My signature indicates my consent to participate.

If you have any questions, please do not hesitate to contact:

Dr. Jeffery D. Snarr, Ph.D.  Pradeep A. Thamboo  Dr. Melissa M. Brown, Ph.D.
Psychology Department  Graduate Student  Psychology Department
585-395-2050  585-395-5424
jsnarr@brockport.edu  Ptham1@u.brockport.edu  mmbrown@brockport.edu

☐ I wish to receive money as compensation for my participation

☐ I am currently enrolled in PSH 110, and I wish to receive participation credit instead of money.

Participant Name (please print legibly):____________________________________________
Appendix C

Demographic Information Form

Directions: Please provide a response for each of the following questions.

1. What is your age? __________

2. What is your gender?
   - O Female
   - O Male
   - O Transgender

3. What is your status at the College at Brockport?
   - O Student
   - O Faculty member
   - O Administrator
   - O Other employee
   - O None of the above

4. If you are a student, what year are you in?
   - O Freshman
   - O Sophomore
   - O Junior
   - O Senior or higher
   - O Non-matriculated undergraduate student
   - O Graduate student
   - O Non-matriculated graduate student

5. Which of the following best describes your relationship status?
   - O Not currently in a committed relationship (single, divorced, or widowed)
   - O In a relationship (not engaged or married), living separately
   - O In a relationship (not engaged or married), living together
   - O Engaged, living separately
   - O Engaged, living together
   - O Married, living separately
   - O Married, living together

6. How long have you and your significant other been in a relationship?
   - O Not currently in a committed relationship (single, divorced, or widowed)
   - O Less than 6 months
   - O More than 6 months
7. With which racial or ethnic category do you most closely identify?

- African
- African American
- Asian
- Asian American
- Caribbean/West Indian
- Caucasian/White
- Indian
- Latino(a)/Hispanic
- Middle Eastern
- Native American Indian
- Pacific Islander/Hawaiian Native
- Other: ___________________________
Appendix D

Five Facet Mindfulness Questionnaire (FFMQ)

Directions:

Please rate each of the following statements using the scale provided, by using the number that best describes your own opinion of what is generally true for you.

1 = never or very rarely true 2 = rarely true 3 = sometimes true 4 = often true 5 = 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.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24.</td>
<td>When I have distressing thoughts or images, I feel calm soon after.</td>
</tr>
<tr>
<td>25.</td>
<td>I tell myself that I shouldn’t be thinking the way I’m thinking.</td>
</tr>
<tr>
<td>26.</td>
<td>I notice the smells and aromas of things.</td>
</tr>
<tr>
<td>27.</td>
<td>Even when I’m feeling terribly upset, I can find a way to put it into words.</td>
</tr>
<tr>
<td>28.</td>
<td>I rush through activities without being really attentive to them.</td>
</tr>
<tr>
<td>29.</td>
<td>When I have distressing thoughts or images I am able just to notice them without reacting.</td>
</tr>
<tr>
<td>30.</td>
<td>I think some of my emotions are bad or inappropriate and I shouldn’t feel them.</td>
</tr>
<tr>
<td>31.</td>
<td>I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.</td>
</tr>
<tr>
<td>32.</td>
<td>My natural tendency is to put my experiences into words.</td>
</tr>
<tr>
<td>33.</td>
<td>When I have distressing thoughts or images, I just notice them and let them go.</td>
</tr>
<tr>
<td>34.</td>
<td>I do jobs or tasks automatically without being aware of what I’m doing.</td>
</tr>
<tr>
<td>35.</td>
<td>When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.</td>
</tr>
<tr>
<td>36.</td>
<td>I pay attention to how my emotions affect my thoughts and behavior.</td>
</tr>
<tr>
<td>37.</td>
<td>I can usually describe how I feel at the moment in considerable detail.</td>
</tr>
<tr>
<td>38.</td>
<td>I find myself doing things without paying attention.</td>
</tr>
<tr>
<td>39.</td>
<td>I disapprove of myself when I have irrational ideas.</td>
</tr>
</tbody>
</table>
Appendix E

Rumination-Reflection Questionnaire (RRQ)

Directions:
Please indicate how often you feel the way described in each statement using the following scale:

5 = Strongly Agree”
4 = Agree
3 = Neutral
2 = Disagree
1 = Strongly Disagree

Rumination Subscale
1. My attention is often focused on aspects of myself I wish I’d stop thinking about
2. I always seem to be rehashing in my mind recent things I’ve said or done.
3. Sometimes it is hard for me to shut off thoughts about myself.
4. Long after an argument or disagreement is over with, my thoughts keep going back to what happened.
5. I tend to “ruminate” or dwell over things that happen to me for a really long time afterward.
6. *I don’t waste time rethinking things that are over and done with.
7. Often I’m playing back over in my mind how I acted in a past situation.
8. I often find myself reevaluating something I’ve done.
9. *I never ruminate or dwell on myself for very long.
10. *It is easy for me to put unwanted thoughts out of my mind.
11. I often reflect on episodes in my life that I should no longer concern myself with.
12. I spend a great deal of time thinking back over my embarrassing or disappointing moments.

Reflection Subscale
13. *Philosophical or abstract thinking doesn’t appeal to me that much.
14. *I’m not really a meditative type of person.
15. I love exploring my “inner” self.
16. My attitudes and feelings about things fascinate me.
17. *I don’t really care for introspective or self-reflective thinking.
18. I love analyzing why I do things.
19. People often say I’m a “deep,” introspective type of person.
20. *I don’t care much for self-analysis.
21. I’m very self-inquisitive by nature.
22. I love to meditate on the nature and meaning of things.
23. I often love to look at my life in philosophical ways.
24. *Contemplating myself isn’t my idea of fun.

*Note. Items 6, 9, 10, 13, 14, 17, 20, 24, 25 are reverse scored
Appendix F

Revised UCLA Loneliness Scale

**Directions:**

Please indicate how often you feel the way described in each statement using the following scale:

- 4 = “I feel this way **often.**”
- 3 = “I feel this way **sometimes.**”
- 2 = “I feel this way **rarely.**”
- 1 = “I have **never** felt this way.”

<table>
<thead>
<tr>
<th>Item</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>I feel in tune with the people around me</em></td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>2. I lack companionship</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>3. There is no-one I can turn to.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>4. I do not feel alone.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>5. <em>I feel part of a group of friends.</em></td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>6. <em>I have a lot in common with the people around me.</em></td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>7. I am no longer close to anyone.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>8. My interests and ideas are not shared by those around me.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>9. <em>I am an outgoing person.</em></td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>10. <em>There are people I feel close to.</em></td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>11. I feel left out.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>12. My social relationships are superficial.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>13. No-one really knows me well.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>14. I feel isolated from others.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>15. <em>I can find companionship when I want it.</em></td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>16. <em>There are people who really understand me.</em></td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>17. I am unhappy being so withdrawn.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>18. People are around me but not with me.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>19. There are people I can talk to.</td>
<td>4 3 2 1</td>
</tr>
<tr>
<td>20. There are people I can turn to.</td>
<td>4 3 2 1</td>
</tr>
</tbody>
</table>

*Note. Items 1, 5, 6, 9, 10, 15, 16, 19, 20 are all reverse scored.*
### Appendix G

**DASS**

**DASS 21**

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
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</table>

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

*The rating scale is as follows:*

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did not apply to me at all - NEVER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Applied to me to some degree, or some of the time – SOMETIMES</td>
<td></td>
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<tr>
<td>2</td>
<td>Applied to me to a considerable degree, or a good part of time – OFTEN</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>Applied to me very much, or most of the time - ALMOST ALWAYS</td>
<td></td>
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</tbody>
</table>

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<th>FOR OFFICE USE</th>
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<td>D  A  S</td>
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<tr>
<th></th>
<th>0 1 2 3</th>
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<tbody>
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<td></td>
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</tbody>
</table>

1. I found it hard to wind down
2. I was aware of dryness of my mouth
3. I couldn’t seem to experience any positive feeling at all
4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)
5. I found it difficult to work up the initiative to do things
6. I tended to over-react to situations
7. I experienced trembling (eg, in the hands)
8. I felt that I was using a lot of nervous energy
9. I was worried about situations in which I might panic and make a fool of myself
10. I felt that I had nothing to look forward to
11. I found myself getting agitated
12. I found it difficult to relax
13. I felt down-hearted and blue
14. I was intolerant of anything that kept me from getting on with what I was doing
15. I felt I was close to panic
16. I was unable to become enthusiastic about anything
17. I felt I wasn’t worth much as a person
18. I felt that I was rather touchy
19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)
20. I felt scared without any good reason
21. I felt that life was meaningless

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### Appendix H:

#### Overview of Unstress II Sessions

<table>
<thead>
<tr>
<th>Session Number</th>
<th>Objectives</th>
<th>Summary</th>
<th>Sample Exercises</th>
<th>Homework Assignments</th>
</tr>
</thead>
</table>
| Session 1      | - Provide overview and introduction of core mindfulness principles.         | Maladaptive attempts to eliminate private experiences such as painful thoughts, feelings, and sensations are often futile. Mindfulness skills—can enable people to handle these experiences effectively. | - "ACT in a Nutshell".  
- Hexaflexercise  
- "The Watcher" | Practice focused breathing (hexaflexercise) for 5 to 10 minutes daily.       |
| Session 2      | - Discuss core values.  
- Distinguish between goals and values.                                     | Participants will be able to better identify core values and the areas of life that provide meaning. | - Bull’s Eye handout.  
- Bull’s Eye handout (goals and values) | - Focused breathing.  
- Continue practicing focused breathing for 5-10 minutes daily.  
- Review top section of join the DOTS handout daily and add new entries.  
- Practice “Silly Songs”  
- Practice “Leaves on a Stream” for at least 5 - 10 minutes daily. |
| Session 3      | - Private Experiences “Creative hopelessness”  
- Teach defusion skills.                                                       | Participants will learn the nature of private experiences and how they affect their overall well-being | - “Silly Songs” exercise (Hayes et al., 1999).  
- “Leaves on a Stream” exercise. | - Acceptance Tool Kit.  
- Demons on the Boat (see appendix).  
- Continue practicing the “Leaves on a Stream” daily.  
- Select one or more favorite acceptance tools from the tool kit to practice daily.  
- Practice exercises each day  
- Complete the Life Compass handout. |
| Session 4      | - Introduce and discuss the concept of “defusion”.  
- Teach defusion skills.                                                      | - Participants will be taught about the nature and function of thoughts. “Defusion” skills can be used to achieve distance from distressing thoughts and feelings. | - “Defusion” skills can be used to achieve distance from distressing thoughts and feelings. | - Time Machine Metaphor.  
- Mindfulness of Your Hand.  
- Compass Metaphor.  
- Life Compass handout.  
- Practice exercises each day  
- Complete the Life Compass handout. |
| Session 5      | - Introduce concept of “acceptance” and teach various acceptance skills.    | - Participants will learn how defusion and acceptance techniques can be combined for coping with distressing thoughts and feelings. | - Acceptance Tool Kit.  
- Demons on the Boat (see appendix). | - Continue practicing the “Leaves on a Stream” daily.  
- Select one or more favorite acceptance tools from the tool kit to practice daily.  
- Practice exercises each day  
- Complete the Life Compass handout. |
| Session 6      | - Discuss the meaning of living within the present moment.  
- Revisit values.                                                            | - Participants will gain insight into the benefits of living in the present moment and how the defusion and acceptance techniques can clear the cognitive barriers that hinder values. | - SMART Goals handout, which will be started during the session. | - Finish setting goals in selected area of life and begin working on them. |
| Session 7      | - Teach SMART goals.                                                         | - Participants will learn how to achieve values-based goals.             | - Overcoming F.E.A.R. (Fusion, Excessive goals, Avoidance of discomfort, Remoteness from values).  
- The D.A.R.E. (Defusion, Acceptance of discomfort, Realistic goals, Embracing values) | - Final session and completion of program. |
| Session 8      | - Discuss future goals and teach methods of overcoming barriers to goal achievement. | - After identifying core values, participants will learn how to accomplish values-based goals. | - Overcoming F.E.A.R. handout (during session). | - Final session and completion of program. |