An investigation of the role of acceptance as a moderator of the relationship between somatic distress and depression

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Abstract
Depression is one of the most commonly diagnosed psychiatric conditions (Segal, Williams, & Teasdale, 2002), and is associated with both significant impacts on individual well-being and functioning, and broader social and economic costs ("Depression Facts," 2001). Given the effectiveness of treatments for the disorder, such high costs are unnecessary. Somatic distress, which can include a variety of physical health symptoms, has been shown to increase the likelihood of developing depression (Cohen, Pine, Must, Kasen, & Brook, 1998). Within the field of mindfulness, research has demonstrated mindfulness based approaches to be effective in the treatment of depression (Piet & Hougaard, 2011). While this is accepted within the clinical world, the specific mechanisms that are of benefit are not clearly understood. One such mechanism, acceptance, has been shown in research to have a strong potential to impact both somatic distress and depression in individuals suffering from those issues (Grossman, Niemann, Schmidt, & Walach, 2004; Shigaki, Glass, & Schopp, 2006). The purpose of this dissertation was to investigate the role that acceptance played between somatic distress and depression. Two primary hypotheses were made including: 1) that somatic distress would be a positive predictor of depression, and 2) that acceptance would moderate the relationship between somatic distress and depression, such that somatic distress would be more strongly related to depression when acceptance is low than when acceptance is high. Results of this dissertation supported both hypotheses. The implications and limitations of these findings, as well as recommendations for future research, are discussed.

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Abstract

Depression is one of the most commonly diagnosed psychiatric conditions (Segal, Williams, & Teasdale, 2002), and is associated with both significant impacts on individual well-being and functioning, and broader social and economic costs ("Depression Facts," 2001). Given the effectiveness of treatments for the disorder, such high costs are unnecessary. Somatic distress, which can include a variety of physical health symptoms, has been shown to increase the likelihood of developing depression (Cohen, Pine, Must, Kasen, & Brook, 1998). Within the field of mindfulness, research has demonstrated mindfulness based approaches to be effective in the treatment of depression (Piet & Hougaard, 2011). While this is accepted within the clinical world, the specific mechanisms that are of benefit are not clearly understood. One such mechanism, acceptance, has been shown in research to have a strong potential to impact both somatic distress and depression in individuals suffering from those issues (Grossman, Niemann, Schmidt, & Walach, 2004; Shigaki, Glass, & Schopp, 2006). The purpose of this dissertation was to investigate the role that acceptance played between somatic distress and depression. Two primary hypotheses were made including: 1) that somatic distress would be a positive predictor of depression, and 2) that acceptance would moderate the relationship between somatic distress and depression, such that somatic distress would be more strongly related to depression when acceptance is low than when acceptance is high. Results of this dissertation supported both hypotheses. The implications and limitations of these findings, as well as recommendations for future research, are discussed.

Keywords: Mindfulness, acceptance, depression, and somatic distress.
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Review of the Literature

Depression

Depression is one of the most commonly diagnosed psychiatric conditions (Segal, Williams, & Teasdale, 2002). It is estimated that 17.5 million Americans suffer from some form of depression ("Depression Facts," 2001). Of these individuals, it is estimated that around 9.2 million have clinically diagnosable depression ("Depression Facts," 2001) and that one in twenty individuals will suffer from Major Depressive Disorder during their lifetime (Peveler, Carson, & Rodin, 2002). Further estimates reveal that between 20-25% of women and 7-12% of men will meet diagnostic criteria for clinical depression at some point during their life (Segal, Williams, & Teasdale, 2002). It is estimated that of individuals with severe Major Depressive Disorder that 15% will die by suicide (American Psychiatric Association, 2000). Around the globe, depression is one of the most prevalent diseases, and is thought to be the basis for as many as one in five appointments to primary care physicians (Kleinman, 2010). Depression knows no geographical boundaries, and affects individuals from all cultural and ethnic groups (Kleinman, 2010). Some research suggests that depression is twice as common in groups of lower socio-economic status than in groups of higher socio-economic status (Kleinman, 2010). Overall, rates of depression are thought to be on the rise (Kleinman, 2010). Given the significant prevalence and immense impact of the disease, research is greatly needed in order to both gain a better understanding of current treatments and to develop new approaches to treating individuals suffering from the disease.

According to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000) clinical
depression is a persistent, depressed mood that is commonly characterized by feelings of sadness or emptiness. Individuals with depression, or more formally, Major Depressive Disorder, experience at least five of the following symptoms, nearly daily, for a period of at least two weeks: 1) depressed mood, 2) loss of interest or pleasure in daily activities, 3) diminished or increased appetite or weight loss, 4) inability to sleep or sleeping too much, 5) psychomotor agitation or retardation, 6) loss of energy or fatigue, 7) feelings of guilt or worthlessness, 8) difficulty thinking or concentrating, and 9) thoughts of death (American Psychiatric Association, 2000). These episodes are characterized by interference in social, occupational, or other areas of functioning.

In addition to its impact on functioning, depression has social and economic costs. Despite numerous effective treatments, some research estimates that two-thirds of individuals do not seek treatment for depression ("Depression Facts," 2001). Beyond this, research suggests that up to 80% of individuals with clinical depression who received treatment experienced a significant improvement in their lives ("Depression Facts," 2001). One aspect of the disease that the DSM-IV-TR (American Psychiatric Association, 2000) does not place as much emphasis upon is the relationship to physical health disease or somatic symptoms (Peveler, Carson, & Rodin, 2002). This relationship in turn leads to higher utilization of healthcare by those individuals, resulting in further taxing of the healthcare system. Depression is associated with an estimated cost of $30.4 billion a year ("Depression Facts," 2001). When taking into consideration both the effectiveness of treatment and the lack of treatment seeking by individuals with depression, such high costs are unnecessary.

**Somatic Distress**
Somatic distress refers to distress of the physical body and is experienced by both healthy individuals and those suffering from a variety of diseases or ailments (Barsky, 2001). Broadly speaking, symptoms of somatic distress can include headache, muscle pain, nausea, fatigue, chest pain, back pain, constipation, weakness, nerve pain, and appetite disturbance (Vimpari, 2003). Somatic distress, often in the form of unexplained physical complaint is commonly accompanied by depression and anxiety (Clark & Smith, 2000).

In the area of physical disease, a high degree of variability exists in the manifestation of physical symptoms (Barsky, 2001). Barsky (2001) notes that symptoms of somatic distress have a notably weak relationship to the physical evidence of disease. From this one can conclude that factors beyond physical disease are at least in part responsible for these symptoms. Barsky (2001) suggests that these factors may include: personality characteristics, trauma history, stressful or major life events, and psychological conditions.

A number of different disorders or diseases take into account the idea that symptoms of somatic distress have an origin other than within physical disease processes. This group of disorders within the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000) is referred to as the Somatoform Disorders. The hallmark of these disorders is the presence of physical symptoms that suggest a general medical condition, however are not explained by the direct evidence of a general medical condition, by the effect of a substance, or by another mental health condition (American Psychiatric Association, 2000). They include: somatization disorder, undifferentiated somatoform disorder,
conversion disorder, pain disorder, hypochondriasis, body dysmorphic disorder,
somatoform disorder not otherwise specified, and neurasthenia (American Psychiatric
Association, 2000; Bschor, 2002).

A growing appreciation of the connection between the mind and the body in
current times has opened up research into the connection between our mental-emotional
health and our physical health. This greater understanding spans across cultural groups
as research has demonstrated that the relationship between somatic symptoms and
psychological distress does not vary across culture (Simon, Gater, Kisely, & Piccinelli,
1996). Given the broad reaching impact of these issues, the associated disability and
resulting high healthcare costs (Peveler, Carson, & Rodin, 2002; Barsky, Orav, & Bates,
2005), further inquiry into more holistic treatments for individuals suffering from a wide
variety of somatic symptoms or distress is needed.

**Depression and Somatic Distress Relationship**

Much research in the psychological literature has suggested the relationship
between somatic symptoms and depression (Vimpari, 2003; Bakal, Coll, & Schaefer,
2008; Peveler, Carson, & Rodin, 2002). It is not unusual for individuals suffering from
somatic symptoms to report psychological distress (Simon, Gater, Kisely, & Piccinelli,
1996; Peveler, Carson, & Rodin, 2002). Within individuals seeking treatment for
depression specifically, the report of somatic symptoms is common (Simon, VonKorff,
Piccinelli, Fullerton, & Ormel, 1999). Research has suggested depression to be strongly
related to somatic symptoms in individuals within primary care settings (Simon, Gater,
Kisely, & Piccinelli, 1996). Peveler and colleauges (2002) suggested that there can be a
number of different relationships between somatic symptoms and depression for individuals in these settings, including depressive symptoms being a complication of physical disease. Some research has suggested that somatic symptoms seen in primary care often dominate the clinical picture, thus increasing the likelihood that depression will be missed in the treatment of the symptoms (Tylee & Ghandi, 2005). Trivedi (2004) suggested that in order to fully achieve remission in the treatment of depression that both the physical or somatic symptoms as well as the depressive symptoms must be addressed. Tylee and Ghandi (2005) supported this idea in suggesting that a holistic approach to treating depression is necessary as primary care physicians are faced with patients with unexplained somatic symptoms.

While research had previously suggested that patients in non-Western countries reported somatic symptoms more commonly than psychological symptoms, newer research has demonstrated that patients in both non-Western and Western countries report somatic symptoms to the same degree (Simon et al., 1999). Similarly, much research suggests that depression knows no geographical boundaries and that the disease affects individuals from a variety of cultural backgrounds (Simon, Von Korff, Piccinelli, Fullerton, & Ormel, 1999).

The somatic symptoms typically reported by individuals suffering from depression include: headache, fatigue, appetite disturbance, constipation, sleep disturbance, weakness, reduced libido, back pain, and general aches and pains (Simon et al., 1999; Vimpari, 2003; Peveler, Carson, & Rodin, 2002; Tylee & Ghandi, 2005). Simon and colleagues (1996) suggested that amongst individuals in general medical settings, individuals with major depressive disorder experienced more distress related
somatic symptoms. They reported further that these symptoms were often left
unidentified by physicians. Tylee and Ghandi (2005) suggested that of individuals
suffering from depression in primary care settings two thirds presented with somatic
symptoms. A research study from a community based sample in Australia found a
correlation of (0.48) between depression and somatic distress (Gillespie, Kirk, Heath,
Martin, & Hickie, 1999). Further, Peveler and colleagues (2002) suggested that roughly a
third of physically ill patients in medical settings experienced symptoms of depression.

Some research has demonstrated a link between gastrointestinal symptoms and
depression (Mayer, Craske, & Naliboff, 2001); while other research has shown
antidepressant therapy to be effective in treating gastrointestinal disorders (Jackson et al.
2000). Chwastiak et al. (2002) investigated the relationship between the severity of
multiple sclerosis and depressive symptoms in a community sample of 1,374 individuals.
They found that individuals with more severe multiple sclerosis were more likely to
experience clinically significant depressive symptoms than individuals with less severe
Survey (NPHS) including a sample of 17,626 individuals, looking specifically at the
relationship between long term medical conditions and depression. Within this study, it
was found that a variety of chronic medical conditions were related to an increased
prevalence of depression. Similarly, Patten (2001) found that of individuals suffering
from chronic health conditions, individuals suffering from a variety of symptoms related
to having a long term medical condition were at a significantly greater risk for developing
depression. Cohen, Pine, Must, Kasen, and Brook (1998) studied 700 individuals from
childhood age to adulthood, looking at physical health symptoms and depression. They
found that physical health problems were related to an increase in the risk for developing major depressive disorder. Interestingly, they also found that major depressive disorder was related to the development of new physical health problems.

Collectively, this research suggests that individuals experiencing somatic symptoms may have a greater likelihood of developing depression.

**Mindfulness**

Mindfulness can be defined as “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994, p. 4). Over the course of the last two decades treatment approaches incorporating mindfulness have been increasingly utilized in the treatment of a wide range of both mental and physical illnesses (Grossman, Niemann, Schmidt, & Walach, 2004). Baer (2003) proposes that, "mindfulness-based interventions may be helpful in the treatment of several disorders” (p. 125). Research suggests that mindfulness based approaches have been found to be helpful in treating individuals with a wide variety of issues ranging from chronic pain and physical illnesses to stress-related disorders (Baer, 2003). In the world of clinical psychology, it is suggested that mindfulness be used as a way to increase awareness, thus providing the opportunity for creating a different and more accepting relationship with our experiences.

**Eastern/Buddhist Origins**

While various definitions and perspectives of mindfulness exist within the Western psychological literature, it is important to consider the root of the term in the Eastern tradition of Buddhism. The Western term mindfulness found its origin in Pali, the language of Buddhist psychology 2,500 years ago (Germer, 2005). In Pali the word for
mindfulness was sati. Here, sati was one aspect of the Buddhist Noble Eightfold path, which as a part of the Buddhist Four Noble Truths, and was defined as a way to guide individuals toward the cessation of suffering and toward enlightenment (de Silva, 1990). Within the Noble Eightfold Path, sati played a fundamental role in the overall structure of the Buddhist belief system (Kang & Whittingham, 2010). The various aspects of the Noble Eightfold Path included right understanding, right thought, right speech, right action, right livelihood, right effort, right mindfulness, and right concentration (de Silva, 1990).

The core and fundamental components of sati include awareness, attention, and remembering (Germer, 2005). These basic components correspond with much of what is discussed within the Western psychological definition of mindfulness. The first component, awareness, is discussed as playing a key role in providing the individual an opportunity to become more aware of what is going on both within and around them (Siegel, Germer, & Olendzki, 2009). The second component of attention is discussed as a more powerful extension of awareness in that the individual is practicing a more focused or refined awareness (Siegel, Germer, & Olendzki, 2009). Brown and Ryan (2003) discuss awareness and attention further as being aspects of consciousness. They suggest that a mindful state of consciousness involves "attention to and awareness of current experience or present reality" (Brown & Ryan, 2003, p. 822). The last component of sati, remembering, does not refer to memories of past events (Siegel, Germer, & Olendzki, 2009). Instead, remembering serves to emphasize that in the Eastern traditions mindfulness involves remembering to bring one’s attention to the present moment, or to make an intent to become more mindful.
Western Perspective

Mindfulness has expanded from its Buddhist origins to encompass a broad range of concepts and practices being applied in the world of Western psychology (Siegel, Germer, & Olendzki, 2009). Overall, mindfulness has been discussed as a technique or approach aimed at facilitating a special type of moment to moment awareness, disengaged from attachment to beliefs, thoughts, and emotions, so as to provide one the opportunity for a greater sense of well-being and balance (Ludwig & Kabat-Zinn, 2008). Ludwig and Kabat-Zinn (2008) suggested that “mindfulness can be considered a universal human capacity proposed to foster clear thinking and open-heartedness.” As such, we all have the inherent ability to become more mindful in our lives.

A variety of definitions of mindfulness exist in the Western psychological literature. Well renowned author and teacher in the field of mindfulness, Dr. Jon Kabat-Zinn proposed one of the more popular definitions in the literature stating that mindfulness is “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). Bishop et al. (2004) proposed another variation stating that mindfulness is “an approach for increasing awareness and responding skillfully to mental processes that contribute to emotional distress and maladaptive behavior” (p. 230). Additionally, Germer (2005) proposed the idea that “To be mindful is to wake up, to recognize what is happening in the present moment” (p. 24).

While various perspectives exist in the field of mindfulness studies, definitions of mindfulness contain the same fundamental concepts. Arguably the most important and foundational concept of mindfulness is the idea of awareness in the present moment.
Germer (2005) captures this fundamental concept in his simple definition of mindfulness, "moment by moment awareness" (p. 26). Here one strives to be more aware of what is happening in the present moment while working to be less distracted by thoughts of the past or the future. Kabat-Zinn (1994) emphasizes another fundamental concept of mindfulness, non-judgment with a more specific definition stating that "Mindfulness means paying attention in a particular way: on purpose, in the present moment, and non-judgmentally" (p. 4). With an emphasis upon non-judgment, mindfulness becomes a way to be aware of the present moment without expending the energy that it typically takes to evaluate, analyze, or judge our experiences. In striving towards this non-judgmental stance in our awareness, we are less interested in evaluating our experiences and more interested in simply noticing whatever our experience is. Kabat-Zinn (1994) emphasizes another fundamental concept in the practice of mindfulness in discussing intent. By setting intent to practice mindfulness, one is making a conscious choice to practice and seek a more mindful state.

**Cultivating Mindfulness**

Of great importance in the learning and cultivation of mindfulness is the understanding that mindfulness is not a simple skill or technique that one can learn in a brief training course (Kabat-Zinn, 2003). It takes great effort and commitment to practice and cultivate a more mindful way of being. Mindfulness opposes the natural predisposition that we hold as human organisms to exist habitually in our thinking minds (Kabat-Zinn, 1994). Our thinking minds are typically oriented within the past or the future and are often influenced by thoughts of what we should have done or what we
need to do. Kabat-Zinn (1994) suggests that in order to “capture our moments in awareness and sustain mindfulness,” we must expend a great deal of energy to do so (p. 8). While this effort is necessary in order to cultivate and maintain a mindful state of awareness, it is important to note that it is innately gratifying to exist in the present moment. In the present moment we are free from the past or the future (Germer, 2004). In the present moment we are able to see our true potential without associated fears and expectations (Kabat-Zinn, 2003). Additionally, we are more able to see areas of our lives that we may have not been attending to, including sadness, grief, anger, and fear. By becoming more aware of these areas of our lives we can better understand them and deal with them (Germer, 2004). At the same time mindfulness can also help us to become more aware of feelings such as peace, joy, and happiness (Germer, 2004). Overall, mindfulness can help us to live more fully, being more aware of our experiences and supporting us in living a more complete and whole existence.

A variety of different approaches exist for the purpose of cultivating a mindful state of awareness, and while these different approaches utilize different techniques, they also share many core characteristics (Bishop et al., 2004). The most commonly discussed approach for cultivating mindfulness is meditation (Kabat-Zinn, 2003). The foundation of meditation practice is “the intentional self-regulation of attention from moment to moment” (Kabat-Zinn, 1982). Of note here is the fact that the specific tradition of meditation being discussed is mindfulness meditation. Within the tradition of mindfulness meditation the foundation of the practice is the focus on the individual’s experience as it changes from moment to moment. This approach contrasts with other
traditions of meditation, like transcendental meditation (Benson & Klipper, 2000), where the focus is upon a specific stimuli, most often a word or a mantra (Baer, 2003).

For the purposes of describing the overall process of mindfulness meditation, Bishop et al. (2004) summarize a typical sitting meditation:

The client maintains an upright sitting posture, either in a chair or cross-legged on the floor and attempts to maintain attention on a particular focus, most commonly the somatic sensations of his or her own breathing. Whenever attention wanders from the breath to inevitable thoughts and feelings that arise, the client will simply take notice of them and then let them go as attention is returned to the breath. This process is repeated each time that attention wanders away from the breath. As sitting meditation is practiced, there is an emphasis on simply taking notice of whatever the mind happens to wander to and accepting each object without making judgments about it or elaborating on its implications, additional meanings, or need for action (Kabat-Zinn, 1990; Segal, Williams, & Teasdale, 2002). The client is further encouraged to use the same general approach outside of his or her formal meditation practice as much as possible by bringing awareness back to the here-and-now during the course of the day, using the breath as an anchor, whenever he or she notices a general lack of awareness or that attention has become focused on streams of thoughts, worries, or ruminations. (p. 232)

In addition to describing a typical sitting meditation within mindfulness practice, this description also emphasizes the value placed upon applying what one has learned in practice to daily life.
As previously mentioned, a variety of other techniques or practices exist for the purpose of cultivating a mindful state of awareness (Germer, 2005). These mindfulness-based techniques or practices all centrally involve focusing one's attention upon some phenomena that enters the individual's field of awareness (Baer, 2003). Within these mindfulness techniques the focus of attention can vary from one exercise to another and include anything from cognitions or thoughts to physical sensations, emotions, or perceptions (Baer, 2003). Overall, these approaches all share the same goal; bringing one’s focus of attention to whatever is happening in the present moment and in a non-judgmental manner (Baer, 2003).

**Mindfulness-Based Treatments and Research**

Within the current psychological literature a number of different treatment approaches designed to help support and teach individuals how to cultivate mindfulness have been investigated (Baer, 2003). These treatment approaches incorporate mindfulness in a variety of different ways ranging from direct mindfulness training to the incorporation of mindfulness principles in conjunction with other behavioral strategies (Kang & Whittingham, 2010). The most popular of these treatments include mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982, 1990), mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002), dialectical behavior therapy (DBT; Linehan, 1993), and acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999). Paralleling the surge of interest in mindfulness in recent years, these treatment approaches have gained increasing popularity and validation as effective treatment approaches for a variety of mental and physical health problems (Carmody & Baer, 2007). Further description of these treatments follows below.
Mindfulness-Based Stress Reduction

One of the first and arguably most widely investigated of the mindfulness-based treatments is MBSR (Kabat-Zinn, 1982, 1990). Originally designed by Dr. Jon Kabat-Zinn in 1979 at the University of Massachusetts Medical Center, MBSR was initially designed as a behavioral health program intended to treat individuals with issues ranging from chronic pain to stress-related disorders (Baer, 2003). A manualized eight to ten week program, MBSR is intended for groups of up to thirty participants. Participants meet for two hours each week during the treatment and conclude with a final seminar lasting roughly eight hours. Participants are taught a variety of different mindfulness practices. Of primary focus, they are guided in formal sitting meditation where the central focus of awareness is on the breath. Additionally, participants are guided in a body scan meditation. Here participants are instructed to lie down with their eyes closed, bringing their attention in an open and non-judgmental manner to various parts of the body. A variety of other techniques incorporating mindfulness are also taught to participants. This includes basic activities like walking, standing, and eating (Baer, 2003). In addition to the mindfulness techniques practiced at each session, participants are strongly encouraged to practice mindfulness exercises each day in between meetings (Baer, 2003). Overall, participants are encouraged to become aware of their experiences within the present moment, including both pleasant and unpleasant thoughts and feelings, and are reminded to maintain their awareness in that moment without judgment.

MBSR has been found to be an effective treatment for a broad range of disorders. A meta-analysis conducted by Grossman et al. (2004) was aimed at investigating the application of MBSR in the treatment of various physical and mental illnesses. Illnesses
included within this meta-analysis included: fibromyalgia, mixed cancer diagnoses, coronary artery disease, chronic pain, depression, and anxiety. The authors in these studies found that MBSR programs may be helpful in reducing the symptoms associated with a broad range of illnesses and disorders. In addition, it was suggested that MBSR may be an effective approach in improving overall coping with distress in both serious illness and everyday life (Grossman et al., 2004).

A literature review was conducted by Shigaki, Glass, and Schopp (2006) investigating the use of MBSR within medical populations. They included individuals with chronic pain, cancer, and heart disease in their literature review. Overall, they suggested that MBSR is likely an effective intervention for a broad range of health problems (Shigaki et al., 2006). Further, they discussed that participants from the studies they reviewed reported reductions in pain, reductions in symptoms of anxiety and depression, improved emotional factors, and increased quality of life (Shigaki et al., 2006).

Carmody and Baer (2007) conducted a broader investigation looking at individuals suffering from physical illness, chronic pain, stress related problems, and anxiety. The relationship between mindfulness practice and medical and psychological symptoms were investigated in this study. Measures of mood, stress, and various medical symptoms were completed both before and after participants completed an 8-session MBSR group. The researchers concluded in this study that mindfulness practice was associated with improvements in both medical and psychological symptoms, as well as improvements in well-being (Carmody & Baer, 2007).

**Mindfulness-Based Cognitive Therapy**
Zindel Segal, Mark Williams and John Teasdale designed another mindfulness-based therapeutic intervention, MBCT, created specifically for the treatment of individuals suffering from recurrent major depressive disorder (Segal, Williams, & Teasdale, 2002). Based upon the MBSR program by Jon Kabat-Zinn, MBCT is also a group-based manualized treatment program. The main difference between the programs is that MBCT is focused entirely on the reduction of depressive relapse and integrates aspects of cognitive therapy. The integration of cognitive therapy techniques is for the purpose of helping individuals to gain a greater awareness of their maladaptive thinking patterns. By facilitating individuals shifting towards taking a more detached approach to their thoughts it helps them to create a more realistic or accurate relationship with their thinking, thus reducing their identification with their maladaptive and negative thought patterns.

A number of different research studies on MBCT have demonstrated its effectiveness in a variety of domains. Piet and Hougaard (2011) conducted a meta-analysis looking at the use of MBCT for individuals with recurrent major depressive disorder. They looked at six randomized controlled studies, including 593 participants. Piet and Hougaard found that for individuals with three or more previous depressive episodes, MBCT significantly reduced the likelihood of relapse. Interestingly, they did not find this to be the case for individuals with two or fewer previous depressive episodes.

Similarly, in another meta-analysis, Chiesa and Serretti (2011) found that MBCT was helpful in reducing depressive relapses for individuals with three or more previous episodes. They also found that when MBCT was used as anti-depressant medication was
gradually reduced that it led to comparable depressive relapse rates as when antidepressant medication was continued. It was also shown in this meta-analysis that MBCT was helpful in reducing symptoms of anxiety in individuals with bipolar disorder and some anxiety disorders (Chiesa & Serretti, 2011). It should be noted that the authors also suggested more rigorous study is needed in this area to further confirm these findings.

**Dialectical Behavior Therapy**

Dialectical Behavior Therapy or DBT (Linehan, 1993) was initially developed by Marsha Linehan at the University of Washington and was originally designed as a treatment for individuals suffering from borderline personality disorder. DBT represents a unique approach to the utilization of mindfulness as mindfulness skills are integrated into behavioral therapy (Linehan, 1993). The dialectic in DBT is utilized as a way to help clients gain a better understanding of the balance between acceptance and change. The goal within this dialectic is to support clients in accepting themselves and whatever they are dealing with and to help them to seek change in any of their problematic behaviors with the goal of improving their lives overall. DBT is structured for clients to spend one year in a weekly skills building group in conjunction to meeting with their individual therapist. The incorporation of mindfulness within DBT treatment differs from MBSR and MBCT. Here mindfulness is taught as skills that clients are taught. Linehan refers to these skills in two categories; "what" skills and "how" skills (Linehan, 1993). The "what" skills are observing, describing, and participating, and the "how" skills are non-judgmentally, one-mindfully, and effectively. Clients are taught these skills in a mindfulness framework and are instructed to use them in whatever way works best and is
most helpful for what they are dealing with.

Research on DBT has shown it to be an effective treatment for individuals suffering from borderline personality disorder as well with some select other populations. Linehan et al. (2006) investigated the use of DBT for individuals with borderline individuals with borderline personality disorder and suicidal behavior. In this study, the authors found that DBT was associated with a number of outcomes in a two year follow-up including clients being half as likely to make a suicide attempt, requiring less hospitalization for suicidal ideation, and amongst suicidal or self-injurious behavior there being lower medical risk (Linehan et al., 2006). Additionally, they found that clients receiving DBT were less likely to drop out of therapy, and had fewer psychiatric hospitalizations and emergencies (Linehan et al., 2006).

A study by Iverson, Shenk, and Fruzzetti (2009) investigated the use of DBT for women victims of domestic abuse. They found that the women who participated in DBT showed significant reductions in depression, hopelessness, and psychiatric distress, as well as increased social adjustment (Iverson, Shenk, & Fruzzetti, 2009).

Telch, Agras, and Linehan (2001) conducted a study to investigate the use of DBT with binge eating disorder. Participants in this study demonstrated significant improvements in binge eating and eating pathology, and 89% of participants were in remission from binge eating disorder at the end of treatment and 56% at a 6 month follow-up (Telch, Agras, & Linehan, 2001).

Lynch, Cheavens, Cukrowicz, Thorp, Bronner, and Beyer (2007) investigated the use of DBT for older adults with co-morbid depression and personality disorder. They found that 71% of patients were in remission after treatment when DBT was used in
combination with anti-depressant medication, as compared to 47% of patients who received only anti-depressant medication. Further, they found that this changed to 75% for DBT and anti-depressant medication as compared to 31% for anti-depressant medication alone at 6 months post treatment (Lynch, Cheavens, Cukrowicz, Thorp, Bronner, & Beyer, 2007).

**Acceptance and Commitment Therapy**

Acceptance and Commitment Therapy is another unique application of mindfulness within a behavioral therapy approach (Hayes, Strosahl, & Wilson, 1999). Developed by Steven Hayes in the mid 1990's, ACT does not utilize mindfulness in the same traditional way as other approaches by teaching mindfulness as the central focus of treatment. Instead, ACT utilizes mindfulness-based principles as strategies. Broadly speaking, ACT is aimed at teaching individuals to observe the events in their lives, both positive and negative, and embrace whatever they are aware of. A main focus of ACT is in treating experiential avoidance and supporting individuals to maintain contact with their experience (Hayes, Strosahl, & Wilson, 1999). Individuals are supported in transcending the self, taking an approach to their experience as observers. Further, they are encouraged to work towards accepting less pleasant or unwanted events from the past and striving to gain a greater understanding and clarity of their personal values. An important principle within ACT is cognitive diffusion. Cognitive diffusion can generally be described as helping individuals to change their relationship with their thoughts, such that their thoughts hold less weight and thus, have less of a potential to create distress (Hayes, Strosahl, & Wilson, 1999).

Research in ACT has demonstrated its effectiveness with a variety of different
populations. A meta-analysis conducted by Powers, Zum Vörde Sive Vörding, and Emmelkamp (2009) looked at 18 different studies with a total sample size of 917 participants. A broad range of populations were included in the meta-analysis including: anxiety, depression, borderline personality disorder, psychosis, polysubstance abuse, drug refractory epilepsy, trichotillomania, weight control, diabetes, chronic pain disability, low back pain, worksite stress, smoking cessation, and math anxiety (Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009). Overall, the authors found that ACT outperformed control conditions across populations both post-treatment and at follow-up. Further, they found that the average participant across studies improved more than 66% of participants in the control conditions. The authors noted in this study, that they did not find that ACT to be better than control conditions for anxiety or depression, nor did they find it to be more effective than current treatments.

Dahl, Wilson, and Nilsson (2004) investigated the use of ACT with a Swedish sample looking at long term disability resulting from stress and pain symptoms. They compared a group receiving standard medical care to a group receiving both standard medical care and ACT. They found that the ACT group used fewer sick days and utilized less medical care than the standard medical group (Dahl, Wilson, & Nilsson, 2004). The authors here, however, did not find any significant improvements in levels of pain, stress, or quality of life in the ACT group.

Gregg, Callaghan, Hayes, and Glenn-Lawson (2007) conducted a study investigating the use of ACT for individuals suffering from type 2 diabetes. They compared two groups; one who received diabetes management education and the other who received both the diabetes management education and ACT. The researchers found
that patients in the ACT group reported better diabetes self-care and indicated glycated hemoglobin (blood sugar) values in the target range. Additionally, they conducted a mediational analysis showing that changes in acceptance, coping, and self-management behavior mediated the treatment’s impact on the glycated hemoglobin levels (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007).

So, overall the research findings from these studies support the idea that mindfulness-based treatments broadly are helpful in treating a wide range of both mental and physical health problems. Despite the unique differences in the way that these treatments incorporate mindfulness, they all utilize the same foundational mindfulness based concepts including present moment awareness, non-judgment, and acceptance.

While the evidence continues to mount for the effectiveness of mindfulness based treatments, the specific mechanisms within mindfulness that account for positive treatment outcomes are still in need of investigation. Both past research, particularly within ACT, and the discussion within the mindfulness literature more broadly has emphasized the value and importance of acceptance as one of these mechanisms.

Acceptance

Acceptance, or what Jon Kabat-Zinn refers to as a “non-striving” attitude, plays a central role in the broader construct of mindfulness (Kabat-Zinn, 1990). Somewhat foreign to Western culture until recent years, acceptance embodies a stance of being open to one’s experience rather than seeking to evaluate or change it (Baer, 2003). Germer, Siegel, and Fulton (2005) suggest that acceptance is an extension of non-judgment and is the first step in allowing ourselves to relate differently to our experiences. They suggest that this is a critical aspect of helping individuals to get through distress and physical
pain. Similarly, Segal, Williams, and Teasdale (2002) suggest that acceptance is a critical aspect within the process of mindfulness stating the opposing view or an unwillingness to accept our experiences is what leads to distress.

The current research and discussion of psychotherapy, particularly in the area of mindfulness-based treatments, has looked at the role of acceptance as a key factor in change. As compared to psychotherapeutic traditions before it, like cognitive behavioral therapy where the focus was upon changing irrational thoughts, the addition of mindfulness has directed treatment more toward observing and accepting one’s experience (Hamilton, Kitzman, & Guyotte, 2006). From this place of observation, one learns that the experiences within awareness is constantly changing, thus providing the opportunity to see that distressing experiences are not necessarily a reflection of reality (Hamilton, Kitzman, & Guyotte, 2006).

As was discussed previously in the summary of mindfulness-based treatment approaches, acceptance plays an important role alongside the other aspects of mindfulness within mindfulness-based treatment approaches. Two of the main mindfulness-based treatments, mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982, 1990) and mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002), incorporate acceptance in a similar manner as an important aspect of mindfulness teaching. Here, the understanding and use of acceptance is gained via discussion and direct experience with specific mindfulness practices. Within acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999) a strong emphasis is placed upon accepting one's experiences just as they are. As such, ACT is designed to teach individuals to simply observe the events in their lives and embrace them whether
positive or negative. Similarly, dialectical behavior therapy (DBT; Linehan, 1993) incorporates acceptance as a key component of treatment emphasizing the importance in finding the balance between acceptance and change. Additionally, a number of skills are taught in DBT, one of which is referred to as radical acceptance. Here, radical acceptance is used as a skill to help individuals come to a place of total acceptance with whatever is happening in their lives. This in turn is thought to help them to better tolerate distressing experiences and emotional states (Linehan, 1993). Overall, while these treatment approaches differ in various ways, the fundamental construct of mindfulness, including acceptance, plays a key role in treatment.

Research into the role of acceptance specifically has shown promising results. A meta-analysis conducted by Levin, Hildebrandt, Lillis, and Hayes (2012) was designed to investigate the foundational treatment components of ACT. They included a total of 66 lab based component studies in their investigation. Upon analysis of the studies, the authors found a significant positive effect size for acceptance in addition to other treatment components including defusion, present moment awareness, and mixed mindfulness components (Levin, Hildebrandt, Lillis, & Hayes, 2012).

An investigation by Masedo and Esteve (2007) looked at the impact of three approaches to pain tolerance intensity, and distress in a group of 219 undergraduate students in an ice water immersion condition. The three approaches were suppression, acceptance and spontaneous coping. The researchers in this study found support for the role of acceptance as an important factor. They found more specifically that the acceptance group demonstrated longer pain tolerance times and lower pain ratings over the other groups (Masedo & Esteve, 2007).
Similarly, a study by Van Damme, Crombez, Van Houdenhove, Mariman, and Michielsen (2006) investigated the role of acceptance within a sample of individuals with chronic fatigue syndrome. The researchers here found that acceptance had a positive effect on fatigue, and was related to higher emotional stability and lower psychological distress in this population (Van Damme, Crombez, Van Houdenhove, Mariman, & Michielsen, 2006).

Lillis, Hayes, Bunting, and Masuda (2009) conducted a study investigating the relationship between mindfulness and acceptance and distress suffered by obese individuals. The study included 84 participants who had completed 6 months or more of a weight loss program. The participants either completed a one day mindfulness and acceptance workshop or were placed on a wait-list. The researchers found at three month follow-up that participants showed improvements in the domains of weight specific acceptance and psychological flexibility (another term for acceptance), as well as in obesity related stigma, quality of life, and distress tolerance. Additionally, the authors found that weight specific acceptance and psychological flexibility (acceptance) mediated the changes in outcome domains (Lillis, Hayes, Bunting, & Masuda, 2009).

Collectively, these studies demonstrate the value that acceptance plays in the treatment of a number of different presenting concerns.

**Role of Acceptance in Somatic Distress and Depression**

Acceptance, as has been discussed, plays a key role in helping individuals get through distress and physical pain (Germer, Siegel, & Fulton, 2005). Many authors (Germer, Siegel, & Fulton, 2005) would suggest that this is accomplished by changing the relationship that one has to their physical symptoms or somatic distress. This then
would allow one to become less attached to their physical distress, and more accepting of it, thus reducing their experience of that distress. This distress may include depressive symptoms, as it is commonly understood in the psychological literature that there exists a relationship between somatic symptoms and depression (Vimpari, 2003; Bakal, Coll, & Schaefer, 2008; Peveler, Carson, & Rodin, 2002). As such, acceptance has a strong potential to impact the relationship between somatic distress and depression in individuals suffering from those issues.

Many of the studies discussed in this paper have demonstrated the utility of both mindfulness and acceptance in a variety of different populations. But what role might acceptance play in the relationship between somatic distress and depression specifically? The studies summarized below serve to highlight some of the current research that begins to look towards this question.

In a study investigating the use of ACT, Vowles and McCracken (2008) looked at a sample of 171 participants suffering from chronic pain. They found that participants significantly improved in the domain of depression in addition to anxiety, pain, disability, medical visits, work status, and physical performance. The researchers here also found that these outcomes were related to acceptance of pain and value based action (Vowles & McCracken, 2008).

Similarly, Veehoff, Oskam, Schreurs, and Bohlmeijer (2011) conducted a meta-analysis investigating the use of ACT for patients with chronic pain. They included twenty-two studies in the analysis with a total of 1235 patients. In their analysis, they found an effect size of 0.37 overall for the controlled studies, with an effect size of 0.32 for depression specifically. They found that MBSR and ACT were not better than
cognitive behavioral therapy, however, it was noted that they can still be effective
treatment alternatives (Veehoff, Oskam, Schreurs, & Bohlmeijer, 2011).

McCracken and Velleman (2010) conducted a study looking at psychological
flexibility (another term for acceptance) in a sample of 239 participants suffering from
chronic pain. In this study, they investigated a number of different factors including
acceptance of chronic pain, psychological acceptance, mindfulness, value based action,
health status, and medical visits. The researchers found a significant relationship between
psychological flexibility (acceptance) and measures of health and medical visits. The
researchers suggested overall that psychological flexibility (acceptance) has the potential
to lessen the impact of chronic pain in those suffering from it (McCracken & Velleman,
2010).

A meta-analysis investigating the impact of mindfulness-based stress reduction
(MBSR; Kabat-Zinn, 1982, 1990) on adults with chronic medical disease demonstrated
overall effect sizes including (0.26) for depression, (0.24) for anxiety, and (0.32) for
psychological distress (Bohlmeijer, Prenger, Taal, & Cuijpers, 2010). Given the smaller
effect sizes found in this meta-analysis, the authors discussed the fact that MBSR was not
initially designed to treat individuals suffering from depression specifically.

So, collectively these studies suggest that acceptance has a strong potential to
impact the relationship between somatic distress and depression in individuals suffering
from those issues. Further, from these studies generally, it can be said that mindfulness
and acceptance have been shown to not only decrease somatic distress, but also to
decrease the psychological symptoms associated with somatic distress. More specifically,
research in this area has shown that mindfulness and acceptance are associated with both
decreases in somatic distress and in depression (Grossman et al., 2004; Shigaki, Glass, & Schopp, 2006). While this research has shown that mindfulness and acceptance have the capacity to decrease both somatic distress and depression, the underlying mechanisms for how these changes occur is not clearly understood. Thus, more research is needed in order to clarify how these changes take place and what underlying mechanisms may be responsible. Further, research is also needed in order to gain a greater understanding of the impact of specific interventions (e.g., MBSR; Kabat-Zinn, 1982, 1990) as well as the role of naturally occurring dispositional variables (e.g., trait measures).

**Hypotheses**

In this dissertation, the following hypotheses were made regarding the relationships between acceptance, somatic distress, and depression:

1) Somatic distress would be a positive predictor of depression.

2) Acceptance would moderate the relationship between somatic distress and depression, such that somatic distress would be more strongly related to depression when acceptance is low than when acceptance is high.

**Method**

**Participants**

Participants in this study included 365 (260 female, 105 male) undergraduate students recruited from a large, public university and a small, private college. Both schools were located in Pacific Northwestern U.S. The mean age for study participants was 21.70 years (SD=5.82). Racial makeup of the sample included 67.4% (n=246) White American, 16.2% (n=59) Asian American, 3.0% (n=11) African American, 1.9% (n=7)
Latino American, 0.8% (n=3) Native American, 8.5% (n=31) Multiracial, and 2.2% (n=8) other.

**Measures**

**Center for Epidemiological Studies Depression Scale (CES-D).** The measure used to assess participants' level of depression is the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item questionnaire in which respondents rate, on a 4-point Likert-type scale (0 = rarely or none of the time, less than 1 day, to 3 = most all of the time, 5–7 days) their depression symptoms over the past week (Radloff, 1977). Of the 20 questionnaire items, 4 are positive and are reverse scored. Sample items include, “I felt depressed” and “I had crying spells.” The CES-D has an alpha coefficient of .85 and expected correlations with a variety of other constructs were obtained (Radloff, 1977) (see appendix A).

**Kentucky Inventory of Mindfulness Skills (KIMS).** The measure used to assess participants' level of acceptance is the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004). The KIMS is a 39-item questionnaire in which respondents rate their overall tendency to be mindful during daily life (Baer et al. 2004). Items are scored on a 5-point Likert-type scale (1 = never or very rarely true to 5 = always or almost always true). The KIMS was designed to measure four different elements of mindfulness: Observe, Describe, Act with Awareness, and the subscale being utilized in the current study, Accept without Judgment. Items within the KIMS include, “I notice when my moods begin to change” (Observe); “I’m good at finding words to describe my feelings” (Describe); “When I do things, my mind wanders off and I’m easily distracted” (Act with Awareness—reverse scored); and “I tell myself that I shouldn’t be feeling the
way I’m feeling” (Accept without Judgment—reverse scored). Internal consistencies as well as test–retest correlations (over a 2 week period) range from .76 to .91 and .65 to .86, respectively, for the four subscales. Exploratory and confirmatory factor analyses supported the proposed four-factor structure, and expected correlations with a variety of other constructs were obtained. The only subscale being utilized for the purpose of the current study is the Accept without Judgment subscale, which demonstrated a test-retest reliability measure of .83 (Baer et al. 2004) (see appendix B).

**Hopkins Symptom Checklist-21 (HSCL-21).** The measure used to assess participants' level of somatic distress is the Hopkins Symptom Checklist-21 (HSCL-21; Deane, Leathem, & Spicer, 1992). The HSCL-21 is a 21-item version of the Hopkins Symptom Checklist (HSCL) which was originally developed to assess psychotherapy outcomes (Deane, Leathem, & Spicer, 1992). The HSCL consists of three subscales: General Feelings of Distress (GFD), Somatic Distress (SD), and Performance Difficulty (PD). Previous research revealed alpha reliability coefficients ranging from .86 to .75 and .85 respectively (Green, Walkey, McCormick, & Taylor, 1988). The magnitude of these coefficients was comparable to the original version of the Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). Each of the three subscales has seven items. The only subscale being utilized for the purpose of the current study is the Somatic Distress subscale, which has an alpha coefficient of .75 (Green, Walkey, McCormick, & Taylor, 1988) (see appendix C).

**Procedure**

The data used in this study was originally collected by the dissertation chair in 2007 therefore it is an archival data set. The hypotheses tested in this dissertation have
not been analyzed before. Potential study participants were recruited through undergraduate psychology courses at their respective institution. Study participants were provided extra credit for their participation in the current study. Additionally, they were entered in a raffle for a chance to win one of four $50 Barnes and Noble gift cards. Study participants completed all study materials in small groups at the time and date that they signed up to participate. All study participants completed an informed consent, as well as the self-administered, paper-and-pencil measures noted. Study participants were told within the informed consent that they could voluntarily withdraw from the study at any time without prejudice, by not completing the measures. Study participants under 18 years of age were excluded from participating in the current study. Approval was received from the Pacific University's Institutional Review Board prior to conducting the current study.

**Research Design**

To test both hypotheses, a hierarchical linear regression analysis was used. To further explore the interaction hypotheses, an investigation of simple slopes was used. Previous to testing the hypotheses, Cronbach’s alpha (Cronbach, 1951) was calculated in order to estimate the internal consistency of all of the scales. Additionally, descriptive statistics (i.e., means, standard deviations, skewness, kurtosis, and correlations between variables) were examined to assess: 1) the similarity of this data to previously reported scores, 2) the normality of score distribution, and; 3) whether or not correlations between variables were in the expected directions.

**Results**

**Data Cleaning**
Before analyzing the data, each variable’s compliance with univariate and multivariate assumptions was examined using SPSS 21.0 (SPSS Inc, 2012). As suggested by Tabachnick and Fidell (2001), only those cases containing at least 85% completed data (e.g., less than 15% missing data) were retained for analysis. Two cases were removed based upon not meeting this criterion (missing 19.4% and 16.7% of data). Three additional cases approaching Tabachnick and Fidell’s cut-off of 15% were removed based upon a more conservative cut-off of 10% missing data (each missing 13.9%). The data in these three cases was found to be missing completely at random based on Little’s (1988) MCAR test. Inspection of the distribution of scores for the CES-D, KIMS – Accept Without Judgment (KIMS-AWJ), and HSCL-21 – Somatic Distress (HSCL-SD) revealed that none were significantly skewed or kurtotic (see Table 1). Lastly, two multivariate outliers were detected and these participants removed from the data set using Mahalanobis distances of p < .001 as a conservative benchmark (Tabachnick & Fidell, 2001). This resulted in a final sample of 358.

**Distribution Characteristics and Descriptive Statistics**

Descriptive statistics for each variable in the form of the mean, standard deviation, skewness and kurtosis is displayed in Table 1. The mean and the standard deviation for the KIMS-AWJ ($M = 28.65, SD = 6.53$), and the HSCL-SD ($M = 11.95, SD = 4.05$), in this sample are similar to those in normative samples: KIMS-AWJ ($M = 29.61, SD = 6.50$; Baer, Smith, & Allen, 2004) and HSCL-SD ($M = 11.67, SD = 3.57$ for males, and $M = 13.18, SD = 5.18$ for females; Deane, Leathem, & Spicer, 1992). The mean and standard deviation for the CES-D ($M = 16.46, SD = 10.13$) was similar to a
comparable college age sample ($M = 16.00, SD = 12.00$ for males, and $M = 18.00, SD = 12.30$ for females; Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995).
### Table 1

**Means, Standard Deviations, Skewness, and Kurtosis by Variable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness (SE)</th>
<th>Kurtosis (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accept</td>
<td>28.65</td>
<td>6.53</td>
<td>-0.17 (.13)</td>
<td>-0.28 (.26)</td>
</tr>
<tr>
<td>Somatic</td>
<td>11.95</td>
<td>4.05</td>
<td>1.02 (.13)</td>
<td>0.79 (.26)</td>
</tr>
<tr>
<td>Depression</td>
<td>16.46</td>
<td>10.13</td>
<td>0.83 (.13)</td>
<td>-0.03 (.26)</td>
</tr>
</tbody>
</table>

*Note. Accept = Accept Without Judgment subscale of the Kentucky Inventory of Mindfulness Skills, Somatic = Somatic Distress subscale of the Hopkins Symptom Checklist-21, Depression = Center for Epidemiological Studies Depression Scale.*
Table 2 lists the zero-order correlations between variables. Acceptance was negatively associated with somatic distress ($r = -0.30$, $p < .001$) and negatively associated with depression ($r = -0.48$, $p < .001$). Depression was positively associated with somatic distress ($r = 0.47$, $p < .001$).
Table 2

*Intercorrelations between Variables*

<table>
<thead>
<tr>
<th></th>
<th>Accept</th>
<th>Somatic</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accept</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somatic</td>
<td>-0.30**</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>-0.48**</td>
<td>0.47**</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* **Correlation is significant at the $p < 0.01$ level (2-tailed). Accept = Accept Without Judgment subscale of the Kentucky Inventory of Mindfulness Skills, Somatic = Somatic Distress subscale of the Hopkins Symptom Checklist-21, Depression = Center for Epidemiological Studies Depression Scale.
Primary Analyses

To test both hypotheses, a hierarchical multiple regression analysis was conducted. Results are summarized in Table 3. Somatic distress was entered first at step one. Consistent with hypothesis 1, somatic distress was a significant positive predictor of depression and accounted for 22% of the variance in depression ($\beta = .47$, $\Delta R^2 = 0.22$, $p < .001$). Somatic distress and acceptance were then entered at step two. Collectively their effect was statistically significant, contributing unique variance to the model ($\Delta R^2 = 0.13$, $p < .001$). When examined individually both somatic distress ($\beta = .35$, $p < .001$) and acceptance demonstrated significance ($\beta = -.38$, $p < .001$). At step 3, the acceptance X somatic distress interaction was added. This interaction was statistically significant and accounted for an additional 1% of the variance in depression ($\beta = -.09$, $\Delta R^2 = .01$, $p = .043$).

To further explore the acceptance X somatic distress interaction, a simple slope analysis was used to plot depression regressed onto somatic distress at high (+1 SD) and low (-1 SD) values of acceptance (see Figure 1). Consistent with hypothesis 2, participants low in acceptance evidenced a significant and stronger relationship between somatic distress and depression ($b = 7.45$, $t = 7.53$, $p < .001$) than those participants high in acceptance, who also evidenced a significant, however weaker relationship between somatic distress and depression ($b = 5.03$, $t = 3.44$, $p < .001$). Additionally, it was found that acceptance moderated the overall relationship between somatic distress and depression ($b = -.03$, $t = -2.03$, $p = .04$).
Table 3

*Regression Analysis Predicting Depression from Somatic Distress, and Acceptance*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>ΔR²</th>
<th>FΔ</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somatic Distress</td>
<td>.47</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td>.13</td>
<td>71.08</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Somatic Distress</td>
<td>.35</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Acceptance</td>
<td>-.38</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td>.01</td>
<td>4.12</td>
<td>.043</td>
</tr>
<tr>
<td>Acceptance X Somatic Distress</td>
<td>-.09</td>
<td></td>
<td></td>
<td>.043</td>
</tr>
</tbody>
</table>
Figure 1. Simple slopes for somatic distress in the prediction of depression at low (-1 SD) and high (+1SD) values of acceptance. The values for somatic distress and acceptance are centered to have a mean of zero.
Discussion

The primary purpose of this dissertation was to investigate the role that acceptance plays in the relationship between somatic distress and depression. Specifically, two hypotheses were tested. First, it was expected that somatic distress would be a positive predictor of depression. Second, it was expected that acceptance would moderate the relationship between somatic distress and depression, such that somatic distress would be more strongly related to depression when acceptance is low than when acceptance is high.

As was expected, the first hypothesis, that somatic distress would be a significant positive predictor of depression, was supported. This finding is in line with previous research showing a relationship between various physical health symptoms and diseases and depression. Of particular interest in this discussion is a study by Patten (1999) who looked at a sample of 17,626 individuals revealing that those individuals with chronic health conditions had an increased prevalence of depression. Additionally, Cohen, Pine, Must, Kasen, and Brook (1998) found in a longitudinal study of 700 individuals that physical health problems were related to an increase in the risk for developing major depressive disorder. So, given this prior research and what we know about some of the impacts that physical health issues and diseases can have on an individual’s mental well-being, it is not surprising to find that somatic distress was a significant predictor of depression.

The second hypothesis, that acceptance would moderate the relationship between somatic distress and depression, such that somatic distress would be more strongly related to depression when acceptance was low than when acceptance was high was also
supported. This demonstrated that the relationship between somatic distress and depression was stronger for individuals with low levels of acceptance as compared to individuals with high levels of acceptance. This suggests that acceptance may play a role as a protective factor when it comes to the relationship between somatic distress and depression, such that individuals may be less vulnerable to developing depression when taking a more accepting stance. This idea is also supported by prior research which suggested that taking an accepting stance or approach can impact both somatic distress and depression. Of note, is a meta-analysis by Veehoff, Oskam, Schreurs, and Bohlmeijer (2011) investigating the use of ACT, an acceptance based treatment, for patients with chronic pain. Their analysis revealed that ACT had a significant impact on both physical well-being and depression. Other research in this area has shown that mindfulness and acceptance are associated with both decreases in somatic distress and in depression (Grossman et al., 2004; Shigaki, Glass, & Schopp, 2006).

Overall, this dissertation adds to the research literature looking at the relationship between somatic distress and depression, and provides a further understanding of the relationship between these variables when other factors are taken into account. Namely, showing that acceptance plays a role in this relationship moderating the strength of the relationship between somatic distress and depression. Of interest in this discussion are not only the basic findings, but also the question of why. Why does acceptance seem to play a role in moderating the relationship between somatic distress and depression? In general, we can point to prior research and discussion of the impact that many have posited acceptance can have on distress, both physical and mental. The interesting question of how those changes occur however is not addressed in this study.
Some notable limitations exist within this dissertation. To begin, the research findings are based entirely on self-report measures which are prone to both intentional and unintentional errors in reporting. While steps were taken to reduce this issue, including assuring that participants’ identity was protected, there is no way to eliminate the impact of error resulting from self-report. Additionally, this study did not utilize a mindfulness-based intervention. Due to this fact, no causal interpretations can be made. Lastly, all participants were gathered from undergraduate institutions in the Pacific Northwest, and were lacking in ethnic diversity. This importantly limits the ability to generalize to other populations.

So overall, what can be gained from this dissertation? Of primary importance are the two main findings that a) somatic distress is a predictor of depression, and b) that acceptance serves to moderate the relationship between somatic distress and depression. While these statements are clear from this study, future research aimed at further understanding the relationships between somatic distress and depression, as well as what benefits acceptance holds is important. Additionally, further intervention based research in this area is warranted as this is a significant gap in mindfulness-based research overall. While further research is always warranted in any domain of study, it cannot go without emphasizing that there appears to be a benefit to those suffering from somatic distress and depression, by adopting a more accepting stance with these issues. As such, individuals diagnosed with chronic health concerns and depression may reap benefit from participating in mindfulness or acceptance based treatment programs.
References


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Depression Facts. (2001). Retrieved June 18, 2010, from Washington University in St. Louis School of Medicine, Department of Psychiatry Web Site: http://www.psychiatry.wustl.edu/depression/depression_facts.html


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therapy by experts for suicidal behaviors and borderline personality disorder.

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Appendix A

Center for Epidemiological Studies Depression Scale (CES-D)

Below is a list of some of the ways you may have felt or behaved. Using the 1-4 scale below, please indicate how often you have felt this way during the past week.

**During the past week...**

<table>
<thead>
<tr>
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<th>1</th>
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<th>3</th>
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<tbody>
<tr>
<td></td>
<td>Rarely or none of the time (less than 1 day)</td>
<td>Some or a little of the time (1-2 days)</td>
<td>Occasionally or a moderate amount of time (3-4 days)</td>
<td>Most or all of the time (5-7 days)</td>
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<td>1</td>
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_____1. I was bothered by things that usually don't bother me.
_____2. I did not feel like eating; my appetite was poor.
_____3. I felt that I could not shake off the blues even with help from my family or friends.
_____4. I felt that I was just as good as other people.
_____5. I had trouble keeping my mind on what I was doing.
_____6. I felt depressed.
_____7. I felt that everything I did was an effort.
_____8. I felt hopeful about the future.
_____9. I thought my life had been a failure.
_____10. I felt fearful.
_____11. My sleep was restless.
_____12. I was happy.
_____13. I talked less than usual.
_____15. People were unfriendly.
_____16. I enjoyed life.
_____17. I had crying spells.
_____18. I felt sad.
_____19. I felt that people disliked me.
_____20. I could not get "going."
**Appendix B**

**Kentucky Inventory of Mindfulness Skills (KIMS)**

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

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<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td></td>
<td>Never or very rarely true</td>
<td>Rarely true</td>
<td>Sometimes true</td>
<td>Often true</td>
<td>Very often or always true</td>
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</table>

_____1. I notice changes in my body, such as whether my breathing slows down or speeds up.
_____2. I’m good at finding the words to describe my feelings.
_____3. When I do things, my mind wanders off and I’m easily distracted.
_____4. I criticize myself for having irrational or inappropriate emotions.
_____5. I pay attention to whether my muscles are tense or relaxed.
_____6. I can easily put my beliefs, opinions, and expectations into words.
_____7. When I’m doing something, I’m only focused on what I’m doing, nothing else.
_____8. I tend to evaluate whether my perceptions are right or wrong.
_____9. When I’m walking, I deliberately notice the sensations of my body moving.
_____10. I’m good at thinking of words to express my perceptions, such as how things taste, smell, or sound.
_____11. I drive on “automatic pilot” without paying attention to what I’m doing.
_____12. I tell myself that I shouldn’t be feeling the way I’m feeling.
_____13. When I take a shower or bath, I stay alert to the sensations of water on my body.
_____14. It’s hard for me to find the words to describe what I’m thinking.
_____15. When I’m reading, I focus all my attention on what I’m reading.
_____16. I believe some of my thoughts are abnormal or bad and I shouldn’t think that way.
_____17. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
_____18. I have trouble thinking of the right words to express how I feel about things.
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<tbody>
<tr>
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<td>Often true</td>
<td>Very often or always true</td>
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19. When I do things, I get totally wrapped up in them and don’t think about anything else.

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

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

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

24. I tend to make judgments about how worthwhile or worthless my experiences are.

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

26. Even when I’m feeling terribly upset, I can find a way to put it into words.

27. When I’m doing chores, such as cleaning or laundry, I tend to daydream or think of other things.

28. I tell myself that I shouldn’t be thinking the way I’m thinking.

29. I notice the smells and aromas of things.

30. I intentionally stay aware of my feelings.

31. I tend to do several things at once rather than focusing on one thing at a time.

32. I think some of my emotions are bad or inappropriate and I shouldn’t feel them.

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

34. My natural tendency is to put my experiences into words.

35. When I’m working on something, part of my mind is occupied with other topics, such as what I’ll be doing later, or things I’d rather be doing.

36. I disapprove of myself when I have irrational ideas.

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

38. I get completely absorbed in what I’m doing, so that all my attention is focused on it.
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<tbody>
<tr>
<td>Never or very rarely true</td>
<td>Rarely true</td>
<td>Sometimes true</td>
<td>Often true</td>
<td>Very often or always true</td>
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</table>

39. I notice when my moods begin to change.
Appendix C

Hopkins Symptom Checklist-21 (HSCL-21)

Use the 1-4 scale below to describe how distressing you have found the statements below to be over the past seven days including today by circling the appropriate number after each statement.

<table>
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<tr>
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<tbody>
<tr>
<td>Not at all</td>
<td>A little</td>
<td>Quite a bit</td>
<td>Extremely</td>
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</table>

1. Difficulty in speaking when you are excited 1 2 3 4
2. Trouble remembering things 1 2 3 4
3. Worried about sloppiness or carelessness 1 2 3 4
4. Blaming yourself for things 1 2 3 4
5. Pains in the lower part of your back 1 2 3 4
6. Feeling lonely 1 2 3 4
7. Feeling blue 1 2 3 4
8. Your feelings being easily hurt 1 2 3 4
9. Feeling others do not understand you or are unsympathetic 1 2 3 4
10. Feeling that people are unfriendly or dislike you 1 2 3 4
11. Having to do things very slowly in order to be sure you are doing them right 1 2 3 4
12. Feeling inferior to others 1 2 3 4
13. Soreness of your muscles 1 2 3 4
14. Having to check and double-check what you do 1 2 3 4
15. Hot or cold spells 1 2 3 4
16. Your mind going blank 1 2 3 4
17. Numbness or tingling in parts of your body 1 2 3 4
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<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>A little</td>
<td>Quite a bit</td>
<td>Extremely</td>
</tr>
<tr>
<td>18.</td>
<td>A lump in your throat</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Trouble concentrating</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Weakness in parts of your body</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Heavy feeling in your arms and legs</td>
<td>1 2 3 4</td>
<td></td>
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