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Mindfulness and emotion in relationships : emotion regulation, empathy, and affect as mediators of the association between mindfulness and relationship satisfaction

Kathryn T. Wiggins

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**MINDFULNESS AND EMOTION IN RELATIONSHIPS:
EMOTION REGULATION, EMPATHY, AND AFFECT
AS MEDIATORS OF THE ASSOCIATION BETWEEN
MINDFULNESS AND RELATIONSHIP SATISFACTION**

by

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DISSERTATION

Submitted in Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy

Psychology

The University of New Mexico
Albuquerque, New Mexico

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DEDICATION

This dissertation is dedicated to the memories of my parents, Ruth and Jack Torbush. By their example, they taught everything that's really important about being in a relationship.

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ABSTRACT

With increasing frequency over the past 25 years, mindfulness has been linked with health and psychological wellbeing. Recently it has also been linked with healthy interpersonal relationships. The present cross-sectional study of 331 diverse adults tested a proposed model for understanding the association between mindfulness and relationship satisfaction through the effects of three concepts related to emotion: emotion regulation, empathy and positivity (ratio of positive to negative affect). Perspective taking, a cognitive aspect of empathy, and positivity partially mediated the association between both mindfulness and relationship satisfaction and mindfulness facet nonreactivity and relationship satisfaction. Positivity emerged as the strongest mediator in both cases. Empathic concern, an affective aspect of empathy, was found to be a significant mediator

of the association between mindfulness and relationship satisfaction only in individuals with a mindfulness meditation practice and for those with very high levels of emotional awareness. When empathic concern was tested as a mediator of the association between nonreactivity and relationship satisfaction, it was only significant in individuals with high levels of emotional dysregulation.

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Chapter 1

INTRODUCTION

The word “mindfulness” is used in Western Buddhism to denote a state of mind in which intentional, nonjudgmental, moment-to-moment awareness is cultivated through the practice of meditation for the purpose of alleviating suffering (Gunaratana, 1990; Hanh, 1976; Kabat-Zinn, 1993). The Buddhist term *dukkha*, translated as “suffering,” refers to the experience of pain and anguish that occurs when an individual’s perception of reality becomes distorted through habitual reactions to physical sensations (e.g. pain) or mental events (e.g. aversion or attachment). It is taught that suffering is an undeniable part of human existence, and that any direct attempt to avoid or eliminate it only serves to make it worse (Ekman, Davidson, Ricard, & Wallace, 2005; Grabovac, Lau, & Willett, 2011; S. M. Kumar, 2002). Traditional Buddhist teachings assert that the practice of mindfulness, with its training in attention and emotional balance, leads to development of insight into “how unexamined behaviors and what Buddhists would call an untrained mind can contribute directly to human suffering, one’s own and that of others” (Kabat-Zinn, 2003; p 146). It is thought that, with time and practice, mindfulness can facilitate less distorted perception, hence, less suffering.

Benefits of cultivating this state of mind, such as gaining awareness, insight, wisdom, and compassion have been well documented within religious and contemplative traditions throughout history (Goldstein & Kornfield, 1987; Goleman, 1976; H. Smith, 1991). However, it is within the 2500 year old Buddhist tradition and literature that mindfulness has been most thoroughly described and developed, providing a framework for this topic

that interests western scientists today. Buddhist teachings, meditation and mindfulness have been topics of interest in the psychological community throughout the past century (Dryden & Still, 2006; Goleman, 1976; J. C. Smith, 1975), beginning as early as William James (1911) and growing after World War II. Until recently however, this interest was predominantly held within the less empirically driven communities within psychology such as the humanist, existentialist, and psychoanalytic schools (Dryden & Still, 2006).

Chapter 2

LITERATURE REVIEW

What is Mindfulness?

It has been suggested that mindfulness is a particular characteristic of consciousness; through intentional “paying attention”, it provides context for the thoughts, memories, emotions and sensations of human experience. It is thought to facilitate the ability of individuals to observe and choose whether or not to interact with those experiences (Brown & Ryan, 2003; Brown, Ryan, & Creswell, 2007; Kabat-Zinn, 1990; Shapiro, Carlson, Astin, & Freedman, 2006; Shapiro & Schwartz, 2000). Mindfulness is thought to occur naturally to some degree in most individuals and has been shown to be trainable.

Beginning in the 1980’s, a growing body of literature has supported the idea that mindfulness contributes to coping and recovery processes in the treatment of psychological problems (see Baer, 2003; Hofmann, Sawyer, Witt, & Oh, 2010; Keng, Smoski, & Robins, 2011 for reviews) as well as physical health problems (See Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; Grossman, Niemann, Schmidt, & Walach, 2004; Praissman, 2008 for reviews). The effectiveness of mindfulness training as both an intervention in itself and as a component of interventions has been described in a large number of studies across widely varying fields of interest. In a recent review of the literature, Brown and colleagues (2007) noted that as of 2006, over 600 mindfulness related reports have been published, and a recent review of the American Psychological Association’s PsychInfo abstract database of psychological literature found over 300 new articles on mindfulness were published in 2011 alone.

Mindfulness based stress reduction (MBSR; Kabat-Zinn, 1982) is the most frequently cited intervention focusing on the benefits of increasing mindfulness by specifically training its skills. Developed by Jon Kabat-Zinn in a behavioral medicine setting, MBSR is used to treat a wide range of problems such as chronic pain and stress associated with diagnoses such as cancer (Birnie, Garland, & Carlson, 2010; Speca, Carlson, Goodey, & Angen, 2000), heart disease (Tacón, McComb, Caldera, & Randolph, 2003), fibromyalgia (Grossman, Tiefenthaler-Gilmer, Raysz, & Kesper, 2007; Lush et al., 2009), chronic pain, gastrointestinal disorders, hypertension, and sleep disorders (Kabat-Zinn, 1993, 2003). MBSR has also shown promise in the treatment of anxiety and anxiety related disorders (Roemer & Orsillo, 2005), post traumatic stress disorder (Kearney, McDermott, Malte, Martinez, & Simpson, 2012), depressive relapse (Teasdale et al., 2000) and disordered eating (Kristeller & Hallett, 1999; B. W. Smith, Shelley, Leahigh, & Vanleit, 2006). Mindfulness is used as a component of clinical interventions such as dialectical behavior therapy (DBT; Linehan, 1993), acceptance and commitment therapy (ACT; S. C. Hayes, Strosahl, & Wilson, 1999), and integrative behavioral couples therapy (IBCT; Jacobson & Christensen, 1996).

In recent years, research on mindfulness has expanded from outcome studies testing its usefulness as a treatment tool, to studies seeking to understand how it works as a treatment tool. Recent theoretical research has included defining, operationalizing, measuring, and creating models to further investigate the construct of mindfulness (Baer, Smith, & Allen, 2004; Bishop et al., 2004; Brown & Ryan, 2003; Fletcher & Hayes, 2005; A. Hayes & Feldman, 2004; Kabat-Zinn, 2003; Teasdale & Segal, 2003). The most recent steps in its study have applied proposed theories and models to specific areas of

interest such as emotional vulnerability (McKee, Zvolensky, Solomon, Bernstein, & Leen-Feldner, 2007), depressive relapse (Piet & Hougaard, 2011), and psychological well-being and quality of life (Nyklicek & Kuijpers, 2008). One area that may benefit from the application of mindfulness is the study of interpersonal relationships, and recently this has work begun. The possibilities are indicated, not only by current research, but also by wisdom dating back for centuries.

Mindfulness and Interpersonal Relationships

Buddhist teachings emphasize that mindfulness is not only a path to awareness and insight, but also to compassion; in essence, it has a distinctly interpersonal nature. Mindfulness and compassion are discussed within Buddhism as “intertwined aspects of the practice of meditation.” (S. M. Kumar, 2002). In his book *Teachings on Love* (1998), Buddhist monk and teacher, Thich Nhat Hanh offers seven “miracles of mindfulness,” six of which involve compassion for others within interpersonal relationships. These six benefits of practicing mindfulness are (1) experiencing whatever and whomever is in our presence, (2) facilitating the other’s presence, (3) nourishing or supporting that other, (4) ameliorating the other’s suffering, (5) deeply observing relationships, and (6) becoming aware of connections with others. Mindfulness is thought to promote attunement, connection, and closeness in relationships, as well as the capacity for compassion and connectedness (Hanh, 1998; Kabat-Zinn, 1993; Kornfield, 1993). This traditional wisdom suggests there is a link between mindfulness and human interpersonal relationships; recent research has begun to explore that link.

Much of the recent research on mindfulness can be applied to interpersonal situations. Fruzzetti and Iverson (2004) cited a large body of research linking individual psychopathology with couple and family dysfunction and general relationship dissatisfaction. Research also suggests that psychological well-being plays a role in healthy relationships (Epstein & Baucom, 2002; Fruzzetti, 1996). Mindfulness has been linked with several aspects of individual psychological well being and with lower levels of psychopathology. In correlational studies, Brown and Ryan (2003) found mindfulness was associated with lower levels of depression, self-consciousness and hostility, and higher levels of positive affect and life satisfaction. They also found positive associations with openness, relatedness, and interpersonal closeness, all traits that are thought to be important in forming and maintaining satisfying relationships.

Researchers have begun to test mindfulness-based treatments for couples and others interested in enhancing their interpersonal skills. In 2004, Carson, Carson, Gil and Baucom reported on a randomized controlled trial of Mindfulness Based Stress Reduction (MBSR) adapted for couples, called Mindfulness Based Relationship Enhancement. They showed that, relative to wait-list controls, couples that participated in their 8-week group had significantly greater relationship satisfaction, partner acceptance, a higher level of happiness and better coping efficacy post-test and at the 3-month follow-up. They also showed lower personal and relationship distress at the same intervals.

In another randomized, wait-list controlled study looking at medical students, Shapiro and colleagues (1998) found that compared to the control group, participants who underwent treatment reported less depression, less state and trait anxiety and increases in empathy. The intervention consisted of an 8-week MBSR group treatment that

incorporated additional exercises to enhance mindful listening skills and empathy. These skills were included to enhance the students' future ability to interact with patients.

Findings such as these suggest that mindfulness may indeed play a role in building and maintaining satisfying relationships. Researchers in several areas have begun to explore that role.

Although the literature is in its infancy, two promising concepts related to emotion have begun to emerge which may help explain how mindfulness affects relationships: emotion regulation and empathy. Emotion regulation describes an intrapersonal aspect of emotion, the individual's ability to influence the experience and expression of their own emotions (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Gross (1998) has suggested that emotion regulation is a process by which individuals "influence which emotions they have, when they have them, and how they experience and express these emotions" (p. 275). Another concept important to relationships, empathy is an interpersonal aspect of emotion: emotion experienced in the context of another person. According to Birnie and colleagues (2010), empathy is the individual's ability to use awareness of their own emotions to make inferences about the emotional experiences of another person and then respond to that person. Empathy includes a cognitive facet, perspective taking, which is the ability to see things from another's point of view, and an affective facet, empathic concern, which is the ability to experience feelings of sympathy and compassion for another (Davis & Oathout, 1987; Schutte et al., 2001).

A third aspect of emotion, labeled "positivity ratio" by Fredrickson and Losada (2005) and defined as the ratio of positive affect to negative affect, seems to play both intrapersonal and interpersonal roles in relationships and may be influenced by

mindfulness. High levels of positive affect even in the presence of conflict have been linked to satisfying relationships (Driver & Gottman, 2004; Gottman, Driver, Tabares, Gurman, & Jacobson, 2002; Todosijevic, Rothblum, & Solomon, 2005), and mindfulness has been linked to both lower levels of negative affect and higher levels of positive affect in individuals (Brown & Ryan, 2003; Sears & Kraus, 2009). While a few studies have looked at mindfulness and the ability to tolerate negative and other challenging emotions (Michaels, 2009; Wachs & Cordova, 2007), the role of positive affect and mindfulness in relationship satisfaction is, as-of-yet, largely unexplored.

Emotion Regulation, Mindfulness and Relationships

There are two schools of thought regarding the concept of emotion regulation. One school stresses control of emotional experience and expression, particularly negative emotions, and reduction of emotional arousal (Kopp, 1989). This approach suggests that problems in emotion regulation lie in the inability to effectively “control” (i.e. diminish or eliminate) emotional experience, expression and arousal.

In contrast, the other school highlights the adaptive functions of emotions and suggests that problems arise when there are deficiencies in the capacity to experience, differentiate and respond effectively to emotions as they arise (Gratz & Roemer, 2004). According to Gratz and Roemer, emotion regulation involves several processes: awareness and understanding of emotions, acceptance of emotions, ability to control impulsive behaviors and continue to pursue personal goals when experiencing challenging emotions, and ability to use adaptive strategies to modulate emotional responses. This viewpoint emphasizes that all emotions serve a purpose and that

individuals vary widely in their ability to make use of their emotions as effective tools to navigate their environment.

Does mindfulness play a role in emotion regulation? The functional conceptualization of emotion regulation is compatible with a definition of mindfulness that includes intentional, nonjudgmental, present-centered awareness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bishop, et al., 2004; Brown & Ryan, 2003). They both include and emphasize awareness and acceptance of emotional responses. Through its quality of present-moment awareness, mindfulness is thought to increase the ability to sustain contact with and examine challenging emotions such as anger, sadness, and hostility (S. C. Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; McKee, et al., 2007). Fletcher and Hayes (2005) suggest that willingness to contact and examine challenging emotions helps individuals identify their priorities and make more informed decisions in their lives.

Buddhist teachings suggest that deliberately attending to one's present moment experience leads to insight into one's emotional life, which in turn leads to the ability to make informed choices about one's path (Goleman, 2003). In a recent correlational study with college students, Coffey and Hartman (2008) found that higher levels of mindfulness were indeed associated with higher ability to manage negative emotion, specifically by decreasing rumination. They suggest that along with increased insight into one's emotional life, skillful management of challenging feelings increases the ability to tolerate and stay in contact with those feelings, leading to exposure and desensitization to them. Through repeated exposure, mindfulness is thought to lead to realizations that these

feelings do not need to be avoided, suppressed or acted upon in negative ways (Baer, 2003; Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006).

Impulsive behavior in response to dysregulated emotions is a common problem. In an interesting experiment, Heppner et al. (2008) explored the connection between mindfulness and the ability to manage impulsive behavior in difficult social situations. Undergraduates were randomly assigned to one of three conditions, social acceptance (the control group), social rejection and mindfulness/social rejection. In the control group participants were told that other participants had accepted them as team members to work on a task. In the two experimental conditions, participants were told that their peers rejected them as team members. In the mindfulness condition, participants underwent a mindfulness induction immediately before receiving this information. After being told they were accepted or rejected by the group, participants completed a computer task that is commonly used in aggressiveness research. Participants who received the mindfulness induction demonstrated significantly less aggressive behavior than those who did not receive the induction. Interestingly, aggressiveness levels were nearly as low as the participants who were socially accepted. Heppner posited that when people are mindful they may be less likely to interpret their peers' ambiguous behaviors as reflecting aggressive intent.

Clinical reports of the benefits of mindfulness have also been supported by brain function research examining the neurobiology of emotional reactivity. Cresswell and associates (2007) looked at amygdala activation and prefrontal cortical mechanisms and found that individuals who were higher in mindfulness were less reactive to threatening emotional stimuli while naming those stimuli.

Is emotion regulation important to relationship satisfaction? Research on emotion regulation in individuals has shown that the ability to experience, differentiate and respond effectively to emotions helps people lead healthy, satisfying lives. Those skills may translate to their interpersonal lives. In their cross-sectional study of married couples, Cordova, Gee and Warren (2005) found correlations between emotional skillfulness and the maintenance of marital adjustment. They noted that it is not having an emotion that affects relationships, but instead, the skillful management of those emotions. Supporting that idea, research has shown that deficits in the individual's ability to regulate their own emotions leads to relationship problems such as difficulty tolerating conflict situations and difficulty tolerating their partners' challenging emotions. Gottman's longitudinal research (1994; 1986) demonstrates that dysregulated emotional responding is strongly linked to marital distress and that distressed couples show more negative affect and negative affect reciprocity than non-distressed couples. Additionally, mood disorders such as depression and anxiety in one partner are linked to relationship distress. In these relationships it is common for both the identified patient and their loved ones to attempt to avoid or suppress thoughts and emotions associated with that disorder (Beach, 2001; Fruzzetti, 1996). On the other hand, in a series of seven correlational studies sampling a wide range of participants from many settings, Schutte and colleagues (2001) found that skillful emotion regulation was consistently related to relationship cooperation and satisfaction.

How might mindfulness influence relationship satisfaction through emotion regulation? In a recent article, Wachs and Cordova presented their theoretical work integrating mindfulness and relationship satisfaction. Their theory of mindful relating

(Wachs & Cordova, 2007) emphasizes effective emotion regulation within relationships, suggesting that mindfulness contributes to satisfaction by promoting skillful ways of experiencing, expressing, managing, and coping with the challenging emotions associated with interpersonal relationships. Their theory suggests that mindful individuals are better able to monitor and respond skillfully to their own emotions, even during challenging conditions such as conflict. They hypothesize that as individuals become better able to monitor and tolerate their own emotions, their tolerance for the challenging emotions of their partner increases, allowing them to stay positively engaged in challenging situations. Wachs and Cordova tested their theory in a study of 33 married couples (each partner responded individually), looking at skills associated with identifying and communicating emotions and with skillful management of anger. In this cross-sectional study, they found that indeed, mindfulness and emotion skillfulness were related to marital quality and that the skills they measured mediated the association between mindfulness and marital quality.

A particularly difficult problem frequently seen in individuals, rumination can have effects on relationships as well. According to Nolen-Hoeksema, rumination is a dysfunctional way of responding to negative thoughts and feelings that involves repetitively focusing on distress (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Block-Lerner and colleagues (2007) suggested that in relationships, rumination and worry can take partners away from present moment events, and Hayes and Feldman (2004) theorized that mindfulness may decrease over-engagement with emotions (i.e. rumination). Two groups of researchers have tested this idea.

In a recent study from the Netherlands, Geschwind and colleagues conducted a randomized control trial of Mindfulness Based Cognitive Therapy (MBCT) in adults with long histories of depression (Geschwind, Peeters, Drukker, van Os, & Wichers, 2011). Using an experience sampling method pre- and post- treatment, they found that, compared with waitlist controls, participants in the MBCT group reported significantly less daily rumination after treatment. In another randomized controlled trial looking at medical and nursing students, Jain et al. (2007) compared a mindfulness meditation group with relaxation and waitlist control groups. They found that while both the mindfulness meditation and relaxation groups experienced reduced distress and increases in positive mood states compared with the control group, only the meditation group showed pre-post decreases in rumination and distraction. They suggested that mindfulness practice may cultivate the ability to shift attention from distressing thoughts back to the present moment. In the context of relationships, this present-moment awareness facilitated by mindfulness may help partners remain engaged even when interactions are challenging.

Empathy, Mindfulness and Relationships

Duan and Hill (1996) traced the meaning of empathy to a German word, “Einfühlung,” which is roughly translated as a process involving humans’ projection of their own emotions into the people and things they perceive. Rogers (1992) suggested that empathy is a process of feeling as if one were the other person, an ability to know/feel the other’s experience as if it were one’s own. Eisenberg and Fabes (1998) defined empathy as an affective response, stemming from the ability to realize another

person's emotional state, that is emotionally similar to what that other person is feeling. All of these definitions draw attention to the interpersonal or nature of empathy.

Empathy is generally thought of as a multidimensional construct, a mental state having both cognitive and affective components (Davis, 1983; Hoffman, 1977). According to Davis, the cognitive component, or perspective taking, describes attempts by the individual to imagine and take on the perspective of another person. It can lead to an emotional response, but does not necessarily do so. It is thought that through healthy awareness of one's own emotions, perspective taking can lead to a more accurate assessment of and response to the other's emotional states (Truax, 1970; Wispé, 1986).

Davis' affective component of empathy, empathic concern, describes the emotional response of the individual to the other, the "other oriented" feelings of sympathy and concern. Empathic concern can lead to feelings of sorrow or concern for the other; however it can also lead to emotional dysregulation, which Einolf (2008, p. 1268) described as "a self-focused, aversive reaction characterized as discomfort, anxiety or concern about one's own welfare." Wachs & Cordova (2007) suggested that the idea of empathy also involves the ability to effectively convey one's understanding of the other's perspective and sympathetic/concerned feelings to the other. They pointed out that this is an important relationship skill.

Does mindfulness play a role in empathy? Teasdale and colleagues (2002) found that if an individual is able to observe thoughts and feelings, accepting them without engagement or avoidance, with time and practice, they can become aware of connections between experiences and emotions. This may lead to a better understanding of the nature and impact of emotions in their own lives and in turn, in the lives of others. Shapiro and

colleagues (2006) suggested that mindfulness may enhance the ability to observe experience without engagement. This observation may then lead to greater clarity and objectivity about that experience. It follows that if this kind of personal emotional awareness without engagement may lead to personal emotional clarity, and it might also lead to greater understanding of the emotions of others. Along these lines of reasoning, Block-Lerner et al (2004) showed that mindfulness of one's own emotions may facilitate skillful use of empathy. They hypothesized that nonjudgmental, present-centered awareness of one's own emotions would facilitate both cognitive and affective aspects of empathy, and in a correlational study looking at 40 women, they found that both perspective taking and empathic concern were moderately correlated with mindfulness (Block-Lerner, Orsillo, & Plumb, 2004).

Is empathy important in relationship satisfaction? A large body of research has suggested that empathy is an important contributor to quality relationships. Early research on empathy was in the area of therapeutic relationships. As early as 1957, Carl Rogers (1992) suggested that empathy is a key element in establishing and maintaining successful therapeutic relationships. Literature reviews have supported that idea, showing that when therapists provide accurate and genuine empathy in their treatments, stronger, more effective therapeutic relationships result (Gelso & Carter, 1994; Patterson, 1984). The 2001 report of the Task Force on Empirically Supported Therapy Relationships considered empathy, positive regard, and genuineness to be core elements of empirically supported therapy relationships (Norcross, 2001).

Interest in empathy quickly grew from attempts to understand and improve processes within therapy to other fields where building and maintaining quality relationships is

important. In a correlational study looking at empathy between adolescents, Worthen (2000) found that adolescents with higher empathy levels are also likely to have higher interpersonal competence and lower levels of aggression. Batson linked empathy to altruism and helping behaviors (Batson et al., 1997; Einolf, 2008). Using path analysis, Davis and Oathout (1987) showed that empathy facilitates relationship quality by increasing the likelihood that important social behaviors will occur, thereby strengthening the relationship. They suggested that to be able to accurately take another person's perspective and then compassionately convey that understanding leads to greater intimacy and satisfaction in relationships. Kilpatrick and colleagues (2002) examined the effects of accurate empathy in newlyweds and found that both husbands and wives who exhibited accurate empathy were more willing to accommodate to their partners during conflict.

Long and colleagues conducted a longitudinal, quasi-experimental study with 48 couples to test an empathy training intervention. Participant couples were randomly assigned to empathy training or a wait list condition and measures were collected at the beginning, end of training and six months later (Long, Angera, Carter, Nakamoto, & Kalso, 1999). They found that participants were able to learn to be more empathic with their partners and that increases in empathy were still detected at the six month follow-up. Additionally, change in empathic expression with partners was positively associated with relationship satisfaction at the six month follow-up, but not at the end of the class, suggesting that while the effects were not immediate, behavioral changes associated with increased empathy led to positive changes in partners' perception of their relationships.

How might mindfulness influence relationship satisfaction through empathy?

Researchers are just beginning to investigate the role empathy may play in the association between mindfulness and interpersonal relationships. It has been suggested that an important component of empathy may be the putting aside, or suspension of one's own thoughts and feelings in service of focusing on a partner's perspective (Gladstein & Feldstein, 1983). This "setting aside" of one's thoughts and feelings might be thought of as "making cognitive room" for the perspective of one's partner and may seem like a reasonable strategy. However, direct attempts to suppress one's own private experience have been shown to be harmful to individuals (S. C. Hayes, et al., 1996). Mindfulness is thought to foster a nonjudgmental, present-moment attitude toward private experience. Through mindfulness practice, individuals can become skilled at observing thoughts and feelings as they pass by instead of engaging with them. This observing behavior instead of engagement may make that cognitive room without the need to suppress thoughts and feelings. In this way the individual may choose to focus attention, not on their own distress, but on relationship events as they are unfolding, allowing him/her to choose whether to take the other's perspective and respond compassionately to events in the context of the relationship. This process may achieve the same ends as suppression, cognitive space for one's partner, without the harmful effects.

Wachs and Cordova (2007) posited that the relationship between mindfulness and empathy may be enhanced by several different aspects of mindfulness. Perspective taking may be a natural outgrowth of the open and curious stance to one's own experience fostered by mindfulness; observing and becoming familiar with one's own emotions make it easier to imagine and take another's perspective. Additionally, mindfulness

encourages individuals to remain in the moment, as opposed to being distracted by thoughts and feelings about the past or future. This may allow more attention to be focused on the other's perspective. They also suggested that compassion and empathic concern may naturally grow out of the experience of personal contact with one's own negative affect and distress.

Affect, Mindfulness and Relationships

Fredrickson defined "affect" as those consciously accessible feelings that are associated with an individual's emotions, physical sensations, attitudes and moods. It is thought to be a general concept of which specific emotions are a subset (2001). Ryff and Singer (2001) suggested that while emotions are typically brief responses to some event, circumstance or object, and the cognitive appraisals of such, affect tends to be objectless and can be more long-lasting. It is experienced in the context of subjective experience and is shaped by personality and environment (Russell & Barrett, 1999).

A large body of evidence points to the existence of two general dimensions of affective experience: negative affect and positive affect (Watson, Clark, McIntyre, & Hamaker, 1992; Watson, Hubbard, & Wiese, 2000; Watson & Tellegen, 1985). Negative affect refers to a general dimension of distress and dissatisfaction, including states such as fear, guilt, anger, and often arise out of perceived threat. Negative emotion has been linked to physical and psychological dysfunction, and that link has driven a large portion of the emotion research conducted since the 1970's to focus on negative affect (Watson, et al., 2000).

On the other hand, positive affect refers to a general dimension of positive mood states such as happiness, interest, and confidence, and has been linked to mental and physical health and well-being (Fredrickson, 2001, 2006; Ryff & Singer, 2001). Starting around 2000, and with the rise of the positive psychology movement, interest in positive affect and its role in human physical and psychological health has grown considerably (Lyubomirsky, King, & Diener, 2005; Seligman, 2008; Seligman & Csikszentmihalyi, 2000). Fredrickson's Broaden and Build Theory of Positive Emotions (2001) set in motion a wave of interest and research into the role of positive affect in helping individuals improve their quality of life.

Does mindfulness play a role in our experience of positive and negative affect? There is a growing body of research linking mindfulness to positive affect. Higher mindfulness scores have been significantly correlated with higher levels of subjective well-being (e.g. lower negative affect and higher positive affect and satisfaction with life) (Brown & Ryan, 2003; Carlson & Brown, 2005). Fredrickson and colleagues tested the hypothesis that increasing mindfulness would increase positive affectivity in a randomized controlled trial of a loving-kindness meditation intervention (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). Often used as one part of the training in MBSR classes, loving-kindness meditation is a type of meditation practice in which people intentionally cultivate warm and caring feelings for others and for themselves (Garland et al., 2010). One hundred and thirty nine adults were randomly assigned to loving-kindness meditation or waitlist conditions. The meditation condition included 6 group sessions of loving-kindness meditation, encouragement to practice outside of the group session and daily reports on emotions experienced and time spent in meditation. These researchers

found that the practice of loving-kindness meditation led to changes in people's daily experience of positive emotions during the nine weeks participants were followed. Increases persisted even on days the participants did not meditate. Increased positive emotions led to reported increases in personal resources including social support and mindfulness and these benefits were still evident at the one-year follow-up.

Hollis-Walker and Colosimo (2011) looked at mindfulness, self-compassion and happiness in a group of 123 college age adults. In this cross-sectional, self report study, they found that mindfulness was positively correlated with self-compassion, happiness, psychological well-being, and positive personality traits such as agreeableness and extraversion, and negatively correlated with neuroticism. They also found that self-compassion was a mediator of the mindfulness-happiness association.

McKee and associates (2007) looked at negative affect, anxiety sensitivity and mindfulness in a cross-sectional study of 154 young adults. They found that higher levels of both negative affect and anxiety sensitivity were negatively correlated with awareness and acceptance facets of mindfulness. Lower levels of mindfulness were associated with more negative affect. In contrast, Geschwind and colleagues (2011) found that, compared to waitlist controls, individuals who underwent standard mindfulness-based cognitive therapy and then six days of experience sampling made more positive emotion appraisals and were more aware of positive events throughout those days. And, in a laboratory stress induction experiment looking at 65 undergraduates, Weinstein and associates (2009) found that more mindful participants perceived less stress in response to induced social threat and recovered more quickly from those threats. In a second study, participants were monitored over a seven-day period looking at everyday stress and well being.

Participants with higher overall levels of mindfulness reported fewer stress appraisals, more adaptive coping and higher well-being on days that they also reported higher levels of mindfulness. In these studies, higher levels of mindfulness were related to higher positive and lower negative affect.

Neuroimaging studies have also begun to explore the neural mechanisms of mindfulness and affect. Davidson and colleagues (2003) reported on a randomized, controlled study on the effects of mindfulness training on the brain and immune function in 41 adults. The meditation group participated in an 8-week MBSR program. Using EEG readings for all participants before randomization, immediately after training and at four months post training, they found an increase in relative left-sided anterior activation in the group that underwent mindfulness training. This increased left-sided activation was associated with more adaptive responding to negative and stressful events and to positive affect in general (Davidson, 1992; Davidson, Ekman, Saron, Senulis, & Friesen, 1990).

Is affect important to relationship satisfaction? In recent years, theories emphasizing the importance of emotion within relationships have evolved (Baucom, Epstein, Kirby, & LaTaillade, 2010; Gottman, Driver, et al., 2002; Johnson & Denton, 2002). Oatley and Johnson-Laird (2011) suggested that emotions provide predictability for social relationships, with happiness eliciting cooperation, sadness leading to detachment and anger to conflict. Gottman (1986) presented evidence that the valence and intensity of emotional responding is important, noting that individuals in distressed relationships tend to respond to their partners' negative affect by increasing the intensity of their own negativity. In his work on depression in couples, Beach (2001) demonstrated an association between disordered emotions and marital distress, and both Jacobson and

colleagues (Christensen, Jacobson, Babcock, & Gurman, 1995) and Johnson (1996) emphasized the importance of skillfully evoking and expressing emotions to facilitate intimacy and conflict resolution.

King (2000) pointed out that the role of positive emotions is two-fold in interpersonal interactions. Positive affect can lead to pleasant interactions with others and those interactions are an important route to experiencing positive emotions. A long tradition of research in social psychology has shown that shared experiences of positive emotions build and support enduring relationships that individuals can call on in times of need. Those same shared experiences are thought to increase the likelihood that an individual will help others in need (Fredrickson, 1998).

In the context of interpersonal relationships, positive affect has been shown to broaden people's sense of self to include others, leading to a communal allocation of resources (Aron, Aron, & Smollan, 1992). Waugh and Fredrickson (2006) conducted a prospective study of first-year college students and found that positive emotions predicted increased self-other overlap with new roommates, which then lead to better understanding of the roommate. They concluded that positive emotions play an important role in the formation of new relationships.

In a cross-sectional study examining relationship satisfaction and affectivity in gay and lesbian couples, Todosijevic and colleagues (2005) found that positive affect was positively correlated and negative affect was negatively correlated with relationship satisfaction. In another cross-sectional study, Donnellan and colleagues (2007) suggested that people who are happy, sociable and self-controlled are likely to be satisfied with their relationships. Hypothesizing that these personality traits have an effect on

relationship quality, they also found that negative interactions mediated the association between personality traits and relationships.

Much of Gottman's work provides evidence for the importance of high levels of positivity and low levels of negativity in relationships (Driver & Gottman, 2004; Gottman, Ryan, Carrere, & Erley, 2002). He has suggested that couples that are able to foster positivity in their relationships, particularly during conflict are at much less risk for relationship dissolution, pointing out that it is not just high negativity that signals problems, but low positivity as well (Gottman, 1994; Gottman & Levenson, 2002).

How might mindfulness influence relationship satisfaction through affect? While a good deal of the current work on affect and mindfulness, particularly positive affect, has focused on the individual, it is reasonable to believe that any process that would increase the health and well being of an individual would spill over into their interpersonal relationships. Barnes and colleagues point out that mindfulness is associated with several "interpersonal supports" that are important for relationships (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007, p. 483), including positive affectivity, self esteem and life satisfaction. In contrast, mindfulness is negatively correlated with negative affectivity, anxiety, anger, hostility, neuroticism, depressive symptoms, and stress reactivity, all of which have been shown to be damaging to relationships. The Barnes group has posited that mindfulness may be associated with general romantic relationship satisfaction, and indeed, several studies have provided evidence to support that association (Carson, Carson, Gil, & Baucom, 2004; Michaels, 2009; Wachs & Cordova, 2007; Wiggins, 2008).

Barnes and colleagues also hypothesized that individuals who are more mindful may have relationships that are lower in emotional and behavioral negativity. To test that theory, they conducted two longitudinal studies with dating college students examining the association of mindfulness to relationship satisfaction and the ability to deal adaptively and productively with relationship stress. In the first study, responses on self report measures showed that higher mindfulness predicted higher relationship satisfaction and more skillful responses to relationship stress at baseline and ten weeks later. In the second study, they brought 60 college-age couples into their lab, and using a conflict discussion paradigm found trait mindfulness predicted fewer emotional stress responses and more skillful communication during the conflict discussion. They also found that higher mindfulness predicted more positive evaluations of the partner and the relationship after conflict.

Fredrickson and Losada (2005) posited that the affective flavor of an individual's life can be captured by their "positivity ratio," a term that refers to the ratio of positive to negative emotions experienced by an individual over time. In two independent samples of college students, one with 87 and the other with 111, these researchers looked at the ratio of positive to negative affect that characterized participants who were identified as having flourishing mental health by Keyes' measure of positive psychological and social functioning (2002). They found that flourishing mental health was associated with positivity ratios above 2.9. Their findings echo those of Gottman as early as 1994 when he reported findings from a longitudinal study of 73 couples who discussed a relationship conflict in his lab. His team measured positivity (affection/caring, humor, interest/curiosity, joy/enthusiasm) and negativity (anger, disgust/contempt, sadness, fear

and shining) using coding schemes that focused on speech and observable emotions. For couples who reported high levels of relationship satisfaction and whose marriages remained intact over the years of observation, mean positivity ratios were 5.1 (speech) and 4.7 (observed emotions). In contrast, couples who reported dissatisfaction and whose relationships later dissolved or became quite troubled, had mean positivity ratios of 0.9 (speech) and 0.7 (observed emotions).

Findings from both of these studies suggest that positivity ratio may be related to both relationship satisfaction and to mindfulness. As of yet, no one has examined whether positivity ratio may be a mechanism by which mindfulness is associated with relationship satisfaction.

In summary, preliminary research supports an association between mindfulness and relationship satisfaction. Studies show that higher trait mindfulness predicts higher relationship satisfaction (Barnes, et al., 2007; Wachs & Cordova, 2007) and that increases in mindfulness via mindfulness training lead to significant improvements in relationship satisfaction (Carson, et al., 2004; Michaels, 2009). Other studies found that increases in mindfulness predicted increases in factors that have been linked to relationship satisfaction, such as empathy (Shapiro, et al., 1998), emotion regulation (Linehan, 1993) and psychological well being (Nyklicek & Kuijpers, 2008), and that higher trait mindfulness predicts higher positive affect and emotional well being (Weinstein, et al., 2009). However, work to understand the processes through which mindfulness influences relationship satisfaction is in its infancy and these processes are still not well-understood. Additionally, much of the previous research linking mindfulness with relationship satisfaction has been conducted with a young, primarily college student population and/or

with couples who report being fairly happy in their relationships. Thus, these data have limited generalizability.

The Current Study

In a preliminary study examining the association between mindfulness and relationship quality, this author examined a model positing that emotion regulation and empathy mediated that association. That early study found that in a population of college students, emotion regulation was a mediator. And, while the cognitive aspect of empathy, perspective taking, mediated the association, the affective component, empathic concern, was not significantly associated with mindfulness and therefore a mediation analysis was not conducted (Wiggins, 2008). Although useful as a preliminary model of the manner in which mindfulness might influence interpersonal relationships, that model was somewhat limited methodologically. Recently, both mindfulness and emotion regulation have been examined in more depth, and new measures have become available.

Definition of the construct “mindfulness” is still being debated, and several measures reflecting the different proposed definitions have been developed. The preliminary study (Wiggins, 2008) used Brown and Ryan’s Mindful Attention Awareness Scale (MAAS, 2003) to assess mindfulness. One of the earliest measures developed, and widely written about, the MAAS assesses attention to and awareness of the present moment. It does not explicitly assess an acceptance component or other mindfulness factors that have subsequently been identified as potentially important to the overall construct.

Using exploratory factor analysis, and starting with several existing measures developed to assess different conceptualizations of mindfulness (Baer, et al., 2004;

Brown & Ryan, 2003; Buchheld, Grossman, & Walach, 2001; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005; S. Kumar, Feldman, & Hayes, 2008) Baer and colleagues identified five facets that they believe are characteristic of mindfulness. They developed the Five Factor Mindfulness Questionnaire (FFMQ, 2006) to more comprehensively capture these multiple aspects of mindfulness. The FFMQ assesses the ability to observe experience, a non-judging or accepting attitude toward experience, acting with awareness rather than acting on autopilot, the ability to describe experience, and nonreactivity to experience.

Consideration of factors above and beyond attention and awareness raises the possibility that other aspects of mindfulness may influence the association between mindfulness and relationship satisfaction. Specifically, the nonreactivity to experience factor, which describes one's ability to tolerate internal distress without becoming overwhelmed by, caught up in, or driven to action by that distress (Baer et al., 2008), may prove to be a path through which mindfulness lessens rumination and impulsive behavior. The current study uses the FFMQ to measure mindfulness and explores both the role of mindfulness as a whole and the role of nonreactivity in relationship satisfaction.

The preliminary model proposed in the preliminary study (Wiggins, 2008) may have also over-simplified emotion regulation. It used two subscales of the Trait Meta-Mood Scale (TMMS, Salovey, et al., 1995) to measure emotional clarity (TMMS clarity) and ability to regulate mood (TMMS repair). Gratz and Roemer (2004) have suggested that emotion regulation may encompass four additional skills above and beyond clarity and ability to repair moods. Their work resulted in the Difficulties in Emotion Regulation

Scale (DERS, 2004), a measure that assesses awareness of one's own emotions, acceptance of emotional experience, clarity about one's feelings, ability to engage in goal directed behavior, impulse control and access to emotion regulation strategies. The current study used this more comprehensive scale to assess more aspects of emotion regulation.

Additionally, although the preliminary study (Wiggins, 2008) found that empathic concern was not significantly correlated with mindfulness, a large body of evidence suggests that this affective component of empathy *is* important to interpersonal relationships (Davis, 1994; Davis & Oathout, 1987). It is thought that by using a more comprehensive measure of mindfulness, and with a more representative population, a statistical relationship that may have been too weak to detect may become significant. Additionally, the 2008 study measured quality of general interpersonal relationships through use of two subscales of Ryff and Keyes Scales of Psychological Well-Being: Positive Relations with Others and Negative Social Interactions (1995). The current study took another look at empathic concern, in the context of romantic relationship satisfaction as measured by the Dyadic Adjustment Scale-7 (DAS-7; Hunsley, Pinsent, Lefebvre, James-Tanner, & Vito, 1995). The DAS-7 is a short form version of the Dyadic Adjustment Scale (DAS; Spanier, 1976), a scale that has been widely used in prior studies of mindfulness and relationship satisfaction. It was hoped that by examining empathic concern as it relates specifically to dyadic adjustment in couples and with a more conceptually comprehensive measure of mindfulness, more insight regarding that path through which mindfulness may influence relationship satisfaction would be provided.

Finally, the current study examined the role of positive and negative affect in the association of mindfulness and relationship satisfaction using Fredrickson and Losada's (2005) concept of positivity ratio. Although Gottman has reported on the predictive power of positive and negative behaviors within relationships (Driver & Gottman, 2004), the current study was the first time Fredrickson's idea of positivity ratio, as measured by self reported positive and negative states, has been examined in the context of relationships.

With these issues in mind, the current study aimed to explore processes by which mindfulness might influence relationship satisfaction by testing several potential mediators. It was speculated by this author, based on the research reviewed above, that three important emotion based processes, effective emotional regulation, higher levels of empathy, and higher ratios of positive to negative affect (positivity ratio), would mediate the association between mindfulness and relationship satisfaction.

Additionally, research on mindfulness and relationship satisfaction to date has largely been conducted with populations of college students and individuals and couples that were generally happy in their relationships. The current study addressed these questions in a diverse population of individuals, recruited through internet advertisement to attract a wide range of ages, ethnicities, time in relationship and satisfaction with relationship as well as individuals with a wide range of experience with meditation and mindfulness.

The primary goal of the current study was to examine how mindfulness and nonreactivity influence relationship satisfaction by testing several possible mediation models. Proposed mediators were effective emotion regulation, empathy, and positivity ratio. Effective emotion regulation was operationalized as higher levels of emotion

regulation as measured by the Difficulty in Emotion Regulation Scale (DERS, Gratz & Roemer, 2004). Empathy was operationalized as both empathic concern and perspective taking, with both aspects measured by the Interpersonal Reactivity Index (IRI, Davis, 1994). Positivity ratio was operationalized as the ratio of positive to negative affect as measured by the Positive and Negative Affect Scale (PANAS, Watson, Clark, & Tellegen, 1988). If effective emotion regulation, empathy, and positivity ratio are ways through which mindfulness and nonreactivity influence relationship satisfaction, then these processes would be shown to mediate that association. The proposed mediation models for this goal can be seen in Figures 1a and 1b.

This study tested a proposed model of the association between mindfulness and relationship satisfaction through effective emotion regulation, empathy and positivity ratio. A series of correlation analyses and mediation analyses tested two hypotheses: (1) both independent variables, mindfulness and nonreactivity, would be associated with dependent variable relationship satisfaction and all proposed mediators. Significant correlations would be seen for each association, and (2) the mindfulness/nonreactivity - relationship satisfaction association would be mediated by effective emotion regulation, empathy and positivity ratio.

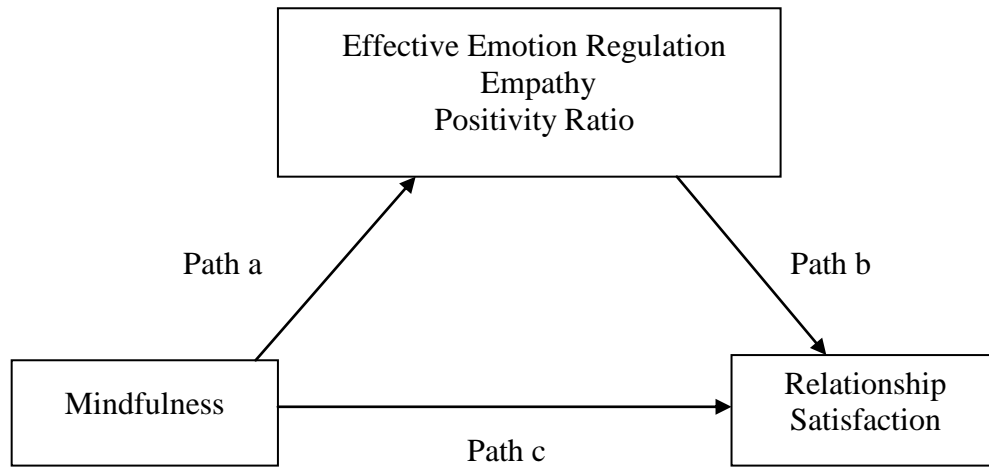


Figure 1a. Proposed mediation models of effective emotion regulation, empathy, and positivity ratio on the effects of mindfulness on relationship satisfaction. and of (b) effective emotion regulation, empathy, and positivity ratio on the effects of nonreactivity on relationship satisfaction.

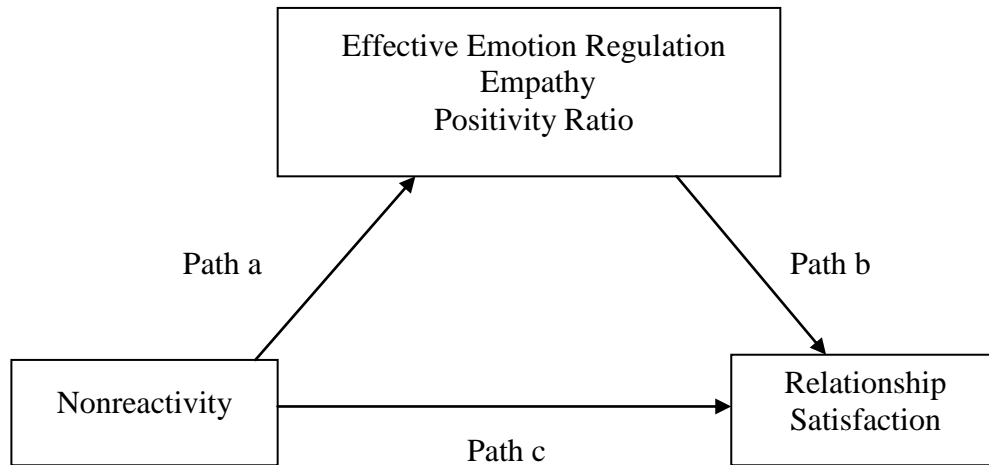


Figure 1b. Proposed mediation models of effective emotion regulation, empathy, and positivity ratio on the effects of nonreactivity on relationship satisfaction.

Chapter 3

Methodology

Participants and Recruitment

Three hundred and thirty one participants completed the survey. Individuals under the age of 18 years were excluded, as were individuals who reported that their relationships had not lasted for at least one year. These two criteria were stated in the consent form, and individuals were asked to verify their age and length of relationship before they were allowed to continue the survey. Some individuals verified that they met these criteria, but then answered subsequent survey questions saying that they were under 18 or in a relationship lasting for less than one year. The survey software identified these individuals and routed them out of the survey. All other individuals that began the survey were allowed to continue.

Several methods of recruitment were pursued. Participants were recruited via the internet through a variety of health and wellness, family friendly, mindfulness, yoga and general meditation online groups. A search of Yahoo Groups was conducted in order to locate groups that appeared to focus on these issues. Yahoo Groups openly post the number of members and membership criteria (e.g. over 18 years of age) on their websites along with information regarding procedures for posting to the group's message board. In the case of groups that allowed immediate posts by new members, the groups were joined and a study announcement regarding the study was placed on group message boards. In the case of groups that required first messages to be moderated, a message was sent to the moderator describing the research study and asking for permission to post. Once

permission was obtained, a study announcement was placed on the list's message board along with the moderator's permission statement. In both cases, the announcement included the University of New Mexico Internal Review Board (IRB) approved study notice, investigator contact information, a link to the study website and a statement encouraging group members to forward the link to other relevant listservs and individuals that might be interested in participating, facilitating a snowball sampling method. Groups were monitored throughout the recruitment period to answer any questions or comments that the post might generate.

Additionally the study was publicized through Craigslist ads and other services that advertise participation in research studies or volunteer activities. Major metropolitan areas as well as suburban and rural areas were chosen for posting these ads to recruit a demographically wide range of additional individuals who might not be reached by announcements placed in internet groups. Because this type of advertising limits the number of words used, snowball sampling was not attempted with these ads.

Finally, additional recruitment was attempted by forwarding a study notice to individuals in the primary investigator's personal contact list, asking those individuals to forward the survey announcement and link on to other individuals that might be interested in participating. This method resulted in the study notice reaching a large variety of individuals as well as being posted on civic group, church, sangha (Buddhist community) and other bulletin boards and websites across the United States.

All participants, including those that were routed out of the survey because they did not meet inclusion criteria, were invited to enter a drawing to win one of three cash prizes (1 - \$100 gift card and 2 - \$50 gift cards). Upon completion of the survey those wishing

to enter the drawing were directed to a separate website where they could choose to enter their contact information which was then stored separately from the data collected for the study.

Procedure

The survey was designed and conducted using Opinio survey software under the University of New Mexico's (UNM) licensure agreement with the ObjectPlanet Inc. the software developers. Opinio is a secure, encrypted, online survey tool administered and maintained by UNM Information Technology services. All collected data were stored on the UNM mainframe computer, under the same security protocols as personal information for students, employees and UNM Health Sciences Center patients. No survey information was linked with personal identifiers at any time.

Once a respondent clicked on the link to the survey they were routed to an IRB approved informed consent document that included text explaining the purpose of the survey, risks and benefits, and an estimation of the time involved in completing the survey. After reading the consent form, verifying their age and the length of the relationship they intended to report on in the survey, and agreeing to participate, the survey was launched in Opinio. Respondents who chose not to participate after reading the consent form, who endorsed being under age 18, who endorsed that their relationship had not lasted at least one year, or who completed the entire survey were shown a final screen thanking them for participating and giving them the option to enter the gift card drawing. Participants who chose to enter the drawing were then routed to a separate secure website where they entered their email address. Participants who closed their

internet browser window without exiting the survey did not have the opportunity to enter the drawing. Identification numbers of participants who submitted contact information were entered into a random number generator function to select the 3 prizewinners at close of data collection. Email addresses collected in the second database were used to contact the winners.

Measures

The literature regarding design of online studies has noted the importance of allowing participants to choose not to answer any question (DeRouvray & Couper, 2002), however, with no human monitor available, there is no way to check to make sure blank items were not skipped inadvertently. To remedy this situation, a response choice for each question of the survey was “decline to answer.” If, during any section of the survey a question was left unanswered, the Opinio software prompted the participant to review the section for unanswered questions before moving to the next section. This approach maintains a respondent’s right to not respond to any question while avoiding unintentionally missed questions. All measures used in this study can be found in Appendix A.

Demographics and Meditation

The first section of the survey included questions regarding demographic information including gender, ethnicity, age and length of relationship. Additionally, participants were asked questions regarding a meditation practice. A response indicating that participant meditated triggered several questions describing the practice, including type

of meditation, length of time practiced (in years), self reported expertise in their practice, frequency of practice, and whether or not the participant believed that their practice affects their relationship. An affirmative answer triggered an open ended question asking the participant to describe that effect. The open ended question was included for possible use in a qualitative analysis at a later date.

Mindfulness

Mindfulness was assessed using the Five Factor Mindfulness Questionnaire (FFMQ, Baer, et al., 2008). The FFMQ consists of 39 self-report items and assesses five facets of a general tendency to be mindful in daily life: *observing* – the tendency to notice or attend to internal and external phenomena, *describing* – the tendency to label internal experiences with words, *acting with awareness* - attending to activities in the moment rather than allowing attention to be focused elsewhere, *non-judging of inner experience* – the tendency to allow and accept current internal and external experience without evaluation, and *nonreactivity to inner experience* – the tendency to experience thoughts and feelings as they pass without getting caught up in or carried away by them. Items are rated on a Likert scale ranging from 1 (*never or very rarely true*) to 5 (*very often or always true*). Sample items for each facet include “I notice the smells and aromas of things” (observing); “I perceive my feelings and emotions without having to react to them” (nonreactivity to inner experience); “I’m good at finding words to describe my emotions” (describing); “I think some of my emotions are bad or inappropriate and I shouldn’t feel them” (non-judging of inner experience, reverse scored); and “I find myself doing things without paying attention” (acting with awareness, reverse scored).

Both the FFMQ total score and the subscale nonreactivity (FFMQnr) score were used as independent variables for this study.

The FFMQ has been shown to have good psychometric properties across student, general community and meditator populations (Baer, et al., 2006; 2008). Internal consistency of the FFMQ among non-meditators (Cronbach's $\alpha = 0.86$) and meditators (Cronbach's $\alpha = 0.95$) have been good to excellent (Van Dam, Earleywine, & Danoff-Burg, 2009). For this study the internal consistency for the FFMQ total score was excellent (Cronbach's $\alpha = .91$).

Baer and colleagues (2006) reported internal consistency for the FFMQnr was adequate to good ($\alpha = .75$) in a student sample. Student samples have consistently shown lower alpha coefficients (.67 - .72). However, across several studies, in community samples of both meditators and non meditators, alpha coefficients have ranged from 0.80 to 0.86 (Coffey, Hartman, & Fredrickson, 2010; Raes, Dewulf, Van Heeringen, & Williams, 2009), in the good range. For the current study internal consistency on the FFMQnr was good ($\alpha = 0.86$). Alpha coefficients for all other subscales of the FFMQ were as follows: observe = 0.86, describe = 0.86, non-judge = 0.94, and act with awareness = 0.92.

Relationship Satisfaction

Relationship satisfaction was assessed using the Abbreviated Dyadic Adjustment Scale (ADAS; Sharpley & Rogers, 1984), later renamed the Dyadic Adjustment Scale - 7 to avoid confusion with several other abbreviated forms of the original Dyadic Adjustment Scale (DAS-7, Hunsley, Best, Lefebvre, & Vito, 2001; Hunsley, et al., 1995).

The DAS-7 is a seven-item self-report measure designed to assess individuals' level of adjustment in their relationships. The scale is an abbreviated form of the Dyadic Adjustment Scale (DAS; Spanier, 1976), considered one of the most widely used gauges of marital satisfaction (Carson, et al., 2004). Three general areas of dyadic adjustment are included in the DAS-7, *dyadic consensus* - assessing participants' perceptions of the degree to which they usually agree with their partners on various matters, *dyadic cohesion* - assessing the frequency with which the participant and his/her partner engage in various activities together and *global dyadic satisfaction* - assessing participants' perceptions of the overall degree of happiness in their relationship. Three items measure dyadic consensus using a 6-point Likert type scale ranging from 0 (*always disagree*) to 6 (*always agree*). Three items measure dyadic cohesion using a 6-point Likert type scale ranging from 0 (*never*) to 6 (*more often than once a day*). One item assesses global dyadic satisfaction using a 7-point Likert type scale ranging from 0 (*extremely unhappy*) to 6 (*perfect*). Higher total scores demonstrate a greater degree of dyadic adjustment and are thought to reflect greater relationship satisfaction. The DAS-7 has been shown to have acceptable to good internal consistency, with Cronbach's alpha coefficients in combined male-female samples ranging from $\alpha = 0.76$ (Sharpley & Rogers, 1984) to $\alpha = 0.82$ (Hunsley, et al., 1995). Evidence for construct validity of the DAS-7 has also been demonstrated (Hunsley, et al., 1995; Sharpley & Rogers, 1984), and Hunsley and colleagues (2001) determined that the DAS-7 was effective in discriminating between distressed and adjusted marriages. In the present study, internal consistency for the DAS-7 was good ($\alpha = .86$).

Effective Emotion Regulation

Effective emotion regulation was measured using the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item self-report measure of difficulties in six areas of emotional dysregulation. To facilitate data analysis and interpretation, DERS scores were reverse-scored to reflect an absence of emotional dysregulation, or the presence of effective emotion regulation. Thus, through reverse coding, higher scores indicate more effective emotion regulation. The scale can be divided into 6 subscales, each accessing a particular area of emotion regulation. Participants were asked to indicate how often each item applied to them using a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). Items assess nonacceptance of emotional responses (e.g. “When I’m upset, I become embarrassed for feeling that way”), difficulties in engaging in goal-directed behavior when upset (e.g. “When I’m upset, I have difficulty getting things done”), impulse control difficulties (e.g. “When I’m upset I feel out of control), lack of emotional awareness (e.g. “I pay attention to how I feel,” reverse scored), limited emotion regulation strategies (e.g. “When I’m upset I believe that there is nothing I can do to make myself feel better”), and lack of emotional clarity (e.g. “I am confused about how I feel”). Gratz and Roemer (2004) reported excellent internal consistency ($\alpha = 0.93$) for the DERS total score. Alpha coefficients of 0.80 were reported for all subscales. For this study internal consistency for the DERS total score was excellent ($\alpha = .95$).

Empathy

Two measures of empathy, empathic concern and perspective taking, were assessed using subscales from the Interpersonal Reactivity Index (IRI; Davis, 1980). The IRI is a 28-item, self-report measure of empathy. Each subscale is 7 items, scored on a 5 point Likert-type scale ranging from 0 (*strongly disagree*) to 5 (*strongly agree*).

The perspective taking subscale assesses a cognitive aspect of empathy, the tendency to adopt another person's perspective. Items include: "When I'm upset at someone, I usually try to 'put myself in his shoes' for a while." The empathic concern subscale assesses an affective aspect of empathy, the tendency to experience feeling of warmth, sympathy and concern toward others. Items include: "I am often quite touched by things that I see happen." Higher scores on both of these subscales indicate higher levels of empathy. The IRI has acceptable internal consistency. Reported alpha coefficients have ranged from $\alpha = 0.71$ to $\alpha = 0.76$ (Davis, 1983, 1994). In the present study, alpha coefficients for the IRI subscales were as follows: 0.76 for empathic concern, in the acceptable range, and 0.80 for perspective taking, in the good range.

Positive and Negative Affect

The 20-item positive and negative affect schedule (PANAS; Watson, et al., 1988) was used to measure levels of positive and negative affect. Level of positive affect refers to the extent to which a person feels enthusiastic and active, and is represented in the measure by 10 words reflective of positive mood states (i.e. proud, inspired). Level of negative affect refers to the extent to which a person feels negative mood states, including anger, sadness, and nervousness, and is represented in the measure by 10 words

reflective of negative mood states (i.e. guilty, upset). Participants were asked to rate the extent to which they experienced each mood on average. They were not specifically instructed to rate their mood states in relation to their partner or their relationship. Each mood state was rated using a 5-point Likert type scale ranging from 1 (*very slightly or not at all*) to 5 (*always/very much*). The PANAS has demonstrated very good internal consistency ($\alpha = .87$) for both positive and negative affect for the time period “over the past few weeks.” In this sample, internal consistency for the PANAS was good ($\alpha = 0.81$).

In his observational work, Gottman has shown that when the negative affective state of contempt is present in large amounts, it is thought to indicate serious problems in a relationship. “Contempt” and “disrespect” both refer to the feeling that something or someone is worthless, inferior or undeserving of respect. These two words were added to the standard 20 word PANAS to reflect negative affective states thought to be present in the context of ailing relationships.

Gottman’s longitudinal research (1994) showed that if there is a high ratio of positive affect to negative affect, relationships are more likely to be more long lasting, and Fredrickson and Losada (2005) posited that a 2.9 mean positivity ratio may be the tipping point for human flourishing. For this study, a composite score of positive affect divided by negative affect was calculated.

Social Desirability

The Marlowe-Crowne Short Form (M-C Scale 3; Reynolds, 1982), a short form of the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960), was used to

detect and control for response bias. The scale consists of 13 items that are rated using a true-false format. Items were designed to detect participants' attempts to make themselves "look good" as well as to measure their need for approval. A sample item is, "No matter who I am talking to, I'm always a good listener." High scores indicate a tendency to offer socially desirable responses. Reynolds (1982) found that the M-C Scale 3 was significantly correlated with the original Marlowe-Crowne Social Desirability Scale and reliability was adequate to good, $\alpha = 0.76$. Internal consistency of the M-C Scale 3 for this study was questionable to adequate, $\alpha = 0.68$. This questionnaire was used as a covariate in all analyses to control for social desirability.

Power Analysis

Based on prior research examining mediators of the association between mindfulness and relationship quality (Todosijevic, et al., 2005; Wiggins, 2008), the anticipated effect size for hypotheses in the current study was approximately $d=0.30$. Power analysis indicated that for this study to have power of 0.95, 217 participants should be recruited. A goal of 300 participants was set to allow for participants who might start, but not complete the survey. Five hundred and three participants responded to the survey announcement and 331 participants completed the survey. Therefore, power was adequate to complete planned analyses and ad hoc analyses.

Statistical Analysis Strategy

SPSS v. 20 was used for the descriptive and correlational analyses reported herein. Mediation analyses were performed using the PROCESS macro for SPSS (A. F. Hayes, 2012).

A decision was made to retain cases in which participants completed all demographic, meditation and mindfulness questions regardless of whether these cases were missing values otherwise. Approximately 4.35% of data was missing due to isolated missing values. Crawford and colleagues (1995) described the importance of determining if data are missing at random and for considering potential covariates when adjusting for these missing data. In the current analysis, dummy coding was used to divide demographic variables (gender, ethnicity, age, and meditation status) into “missing data” and “no missing data” cases. Independent samples t-tests were calculated to determine if cases with missing data were significantly different from cases without. Only the ethnicity variable showed significant differences; therefore, using a method proposed by Crawford, missing data were imputed using the mean scores for each ethnic group.

Initial data screening revealed significant non-normal distribution of all measures except the total mindfulness scores, as assessed by Shapiro-Wilks test (FFMQ, $p < 0.05$, all other p 's < 0.001). See Figures 2a through 2h for histograms displaying those distributions. Univariate and multivariate outliers were examined and it was determined that no outlier appeared to be the product of random responding or errors in data input, and all responses were within the acceptable range. In essence, outliers appeared to reflect particularly distressed participants. Therefore, no cases containing outliers were excluded. Because distributions were non-normal, and because adequate non-parametric

tests were available to perform all planned analyses, the decision was made to use non-parametric tests rather than to transform the data.

Non-parametric tests were conducted to examine possible effects of demographic variables (age, gender, ethnicity, meditation status) on the dependent variable (DV), relationship satisfaction. Because gender and meditation are dichotomous variables, Independent-Samples Mann-Whitney U tests were used for these two tests. For associations between categorical variables with more than two categories (e.g. age, ethnicity, length of relationship) and the DV, Independent-Samples Kruskal-Wallis tests were used.

Pearson's correlations are known to be sensitive to outliers. Therefore, bivariate Spearman's *rho* correlations, which are not sensitive to outliers, were chosen to examine associations between the independent variables (IVs) and DV as well as between the IVs and all potential mediators. Spearman's Rho correlations showing the associations between each of the other mindfulness facets (observe, describe, nonjudge and act with awareness) and the DV were also examined. Finally, correlations of the social desirability measure and all IVs, DV and mediators were examined to assess the need to control for this measure in subsequent analyses.

Effects of mediation were derived using bootstrapping, a well accepted, non-parametric resampling approach to estimating effect size and hypothesis testing in many types of analyses, including mediation (Bryan, Schmiede, & Broaddus, 2007; Fairchild & MacKinnon, 2009; MacKinnon, Cheong, & Pirlott, 2012; Preacher & Hayes, 2004). Bootstrapping provides an estimated value for the indirect effect along with estimated standard error and bias corrected and accelerated confidence intervals for a given sample

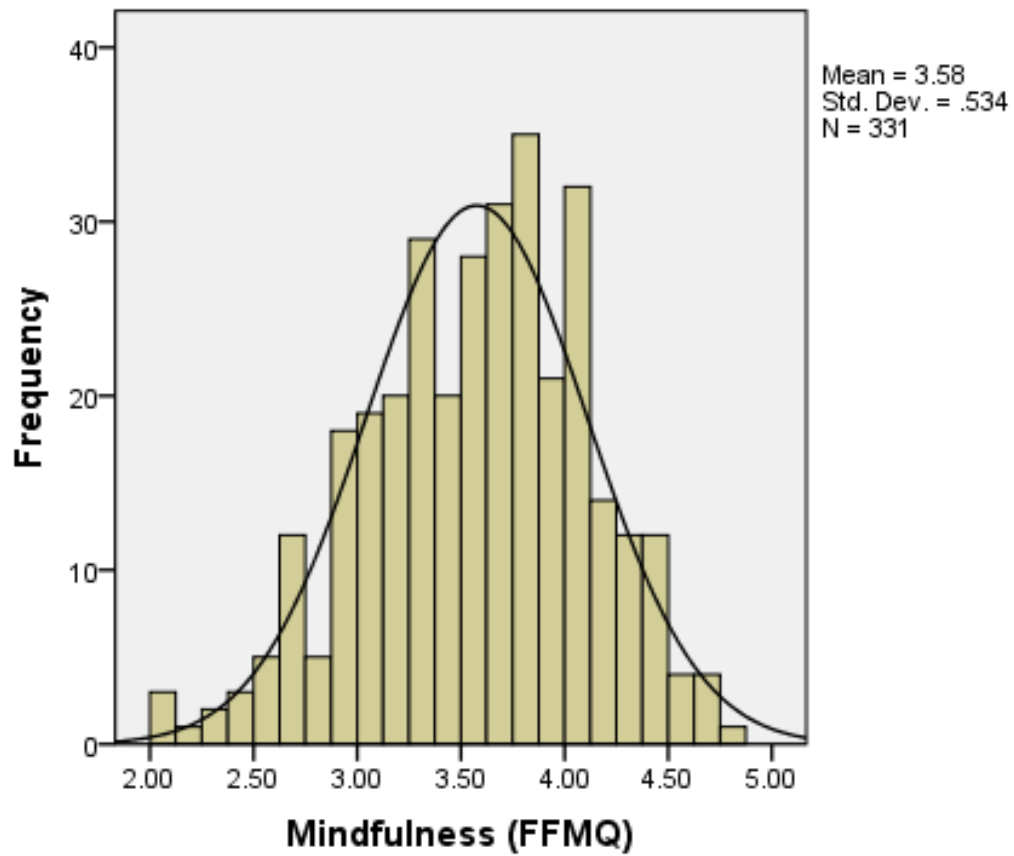


Figure 2a. Histogram showing distribution of study variable mindfulness with normal curve superimposed.

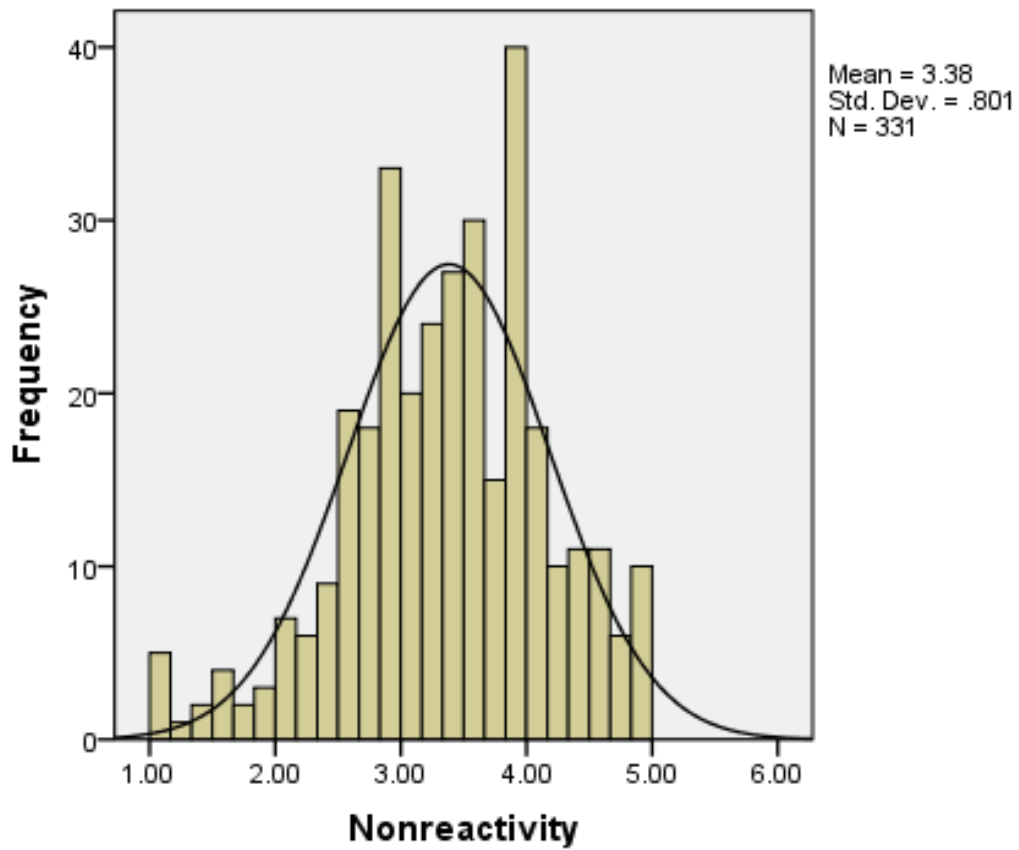


Figure 2b. Histogram showing distribution of study variable mindfulness facet nonreactivity with normal curve superimposed.

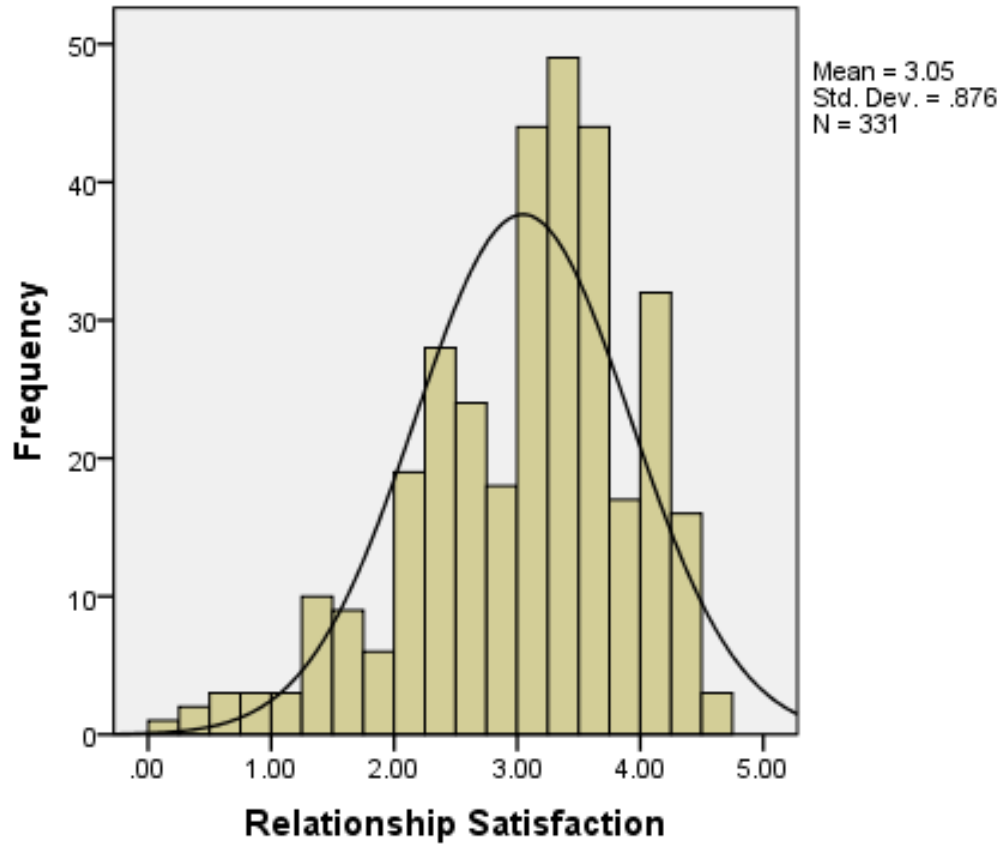


Figure 2c. Histogram showing distribution of study variable relationship satisfaction with normal curve superimposed.

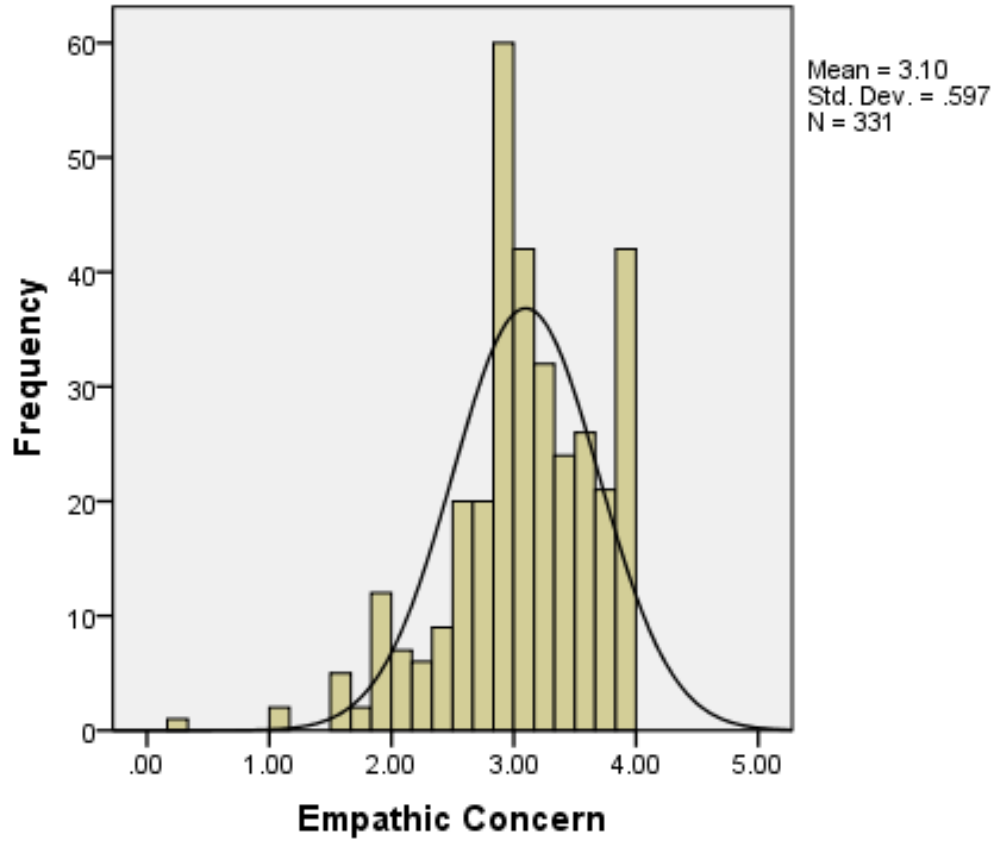


Figure 2d. Histograms showing distributions of study variable empathic concern with normal curve superimposed.

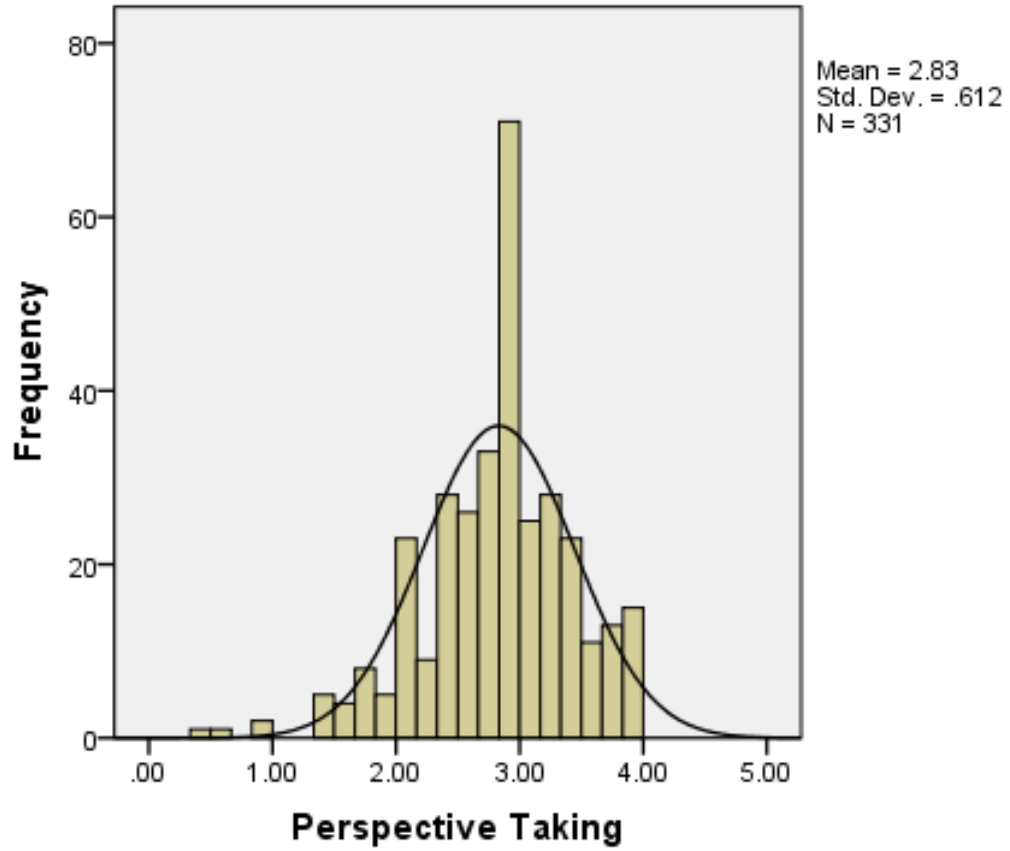


Figure 2e. Histogram showing distribution of study variable perspective taking with normal curve superimposed.

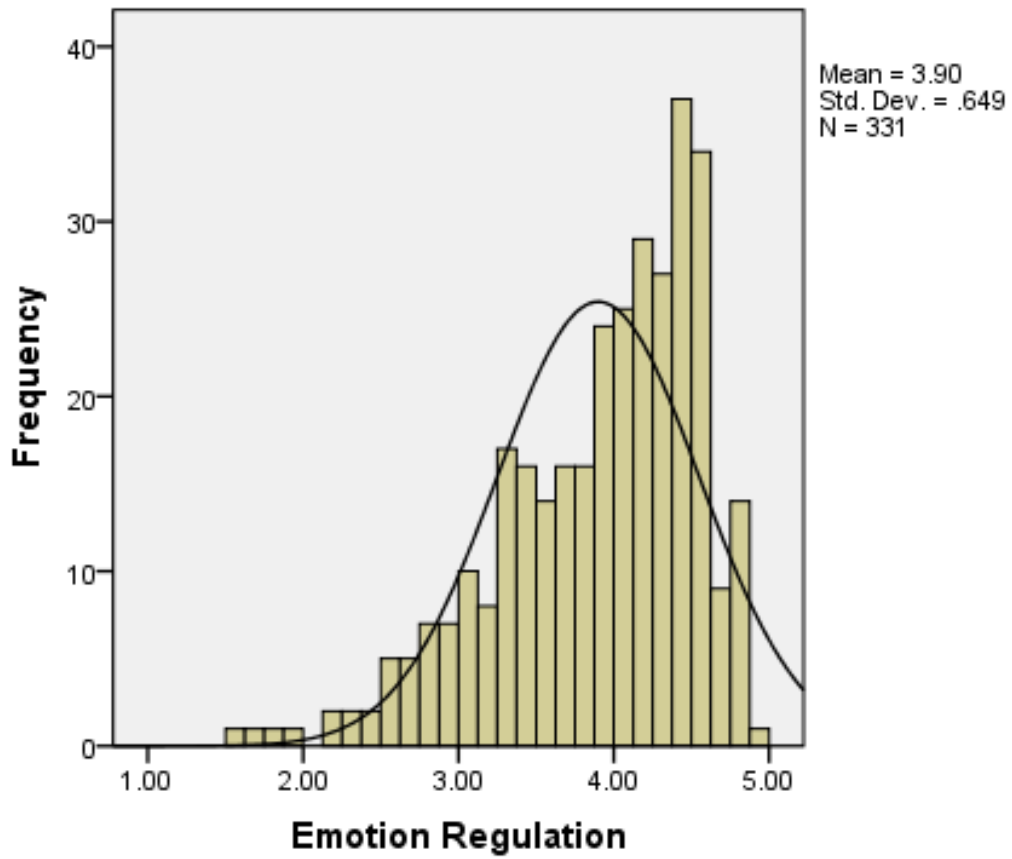


Figure 2f. Histogram showing distributions of study variable effective emotion regulation with normal curve superimposed.

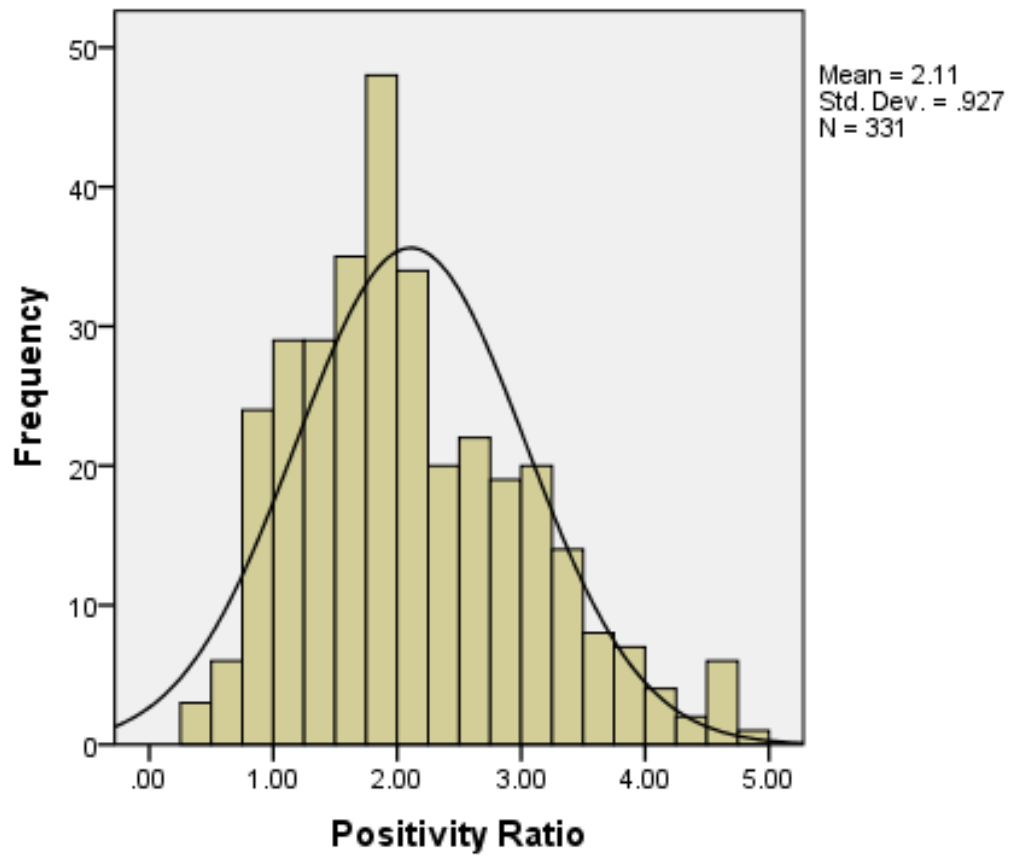


Figure 2g. Histogram showing distribution of study variable positivity ratio with normal curve superimposed.

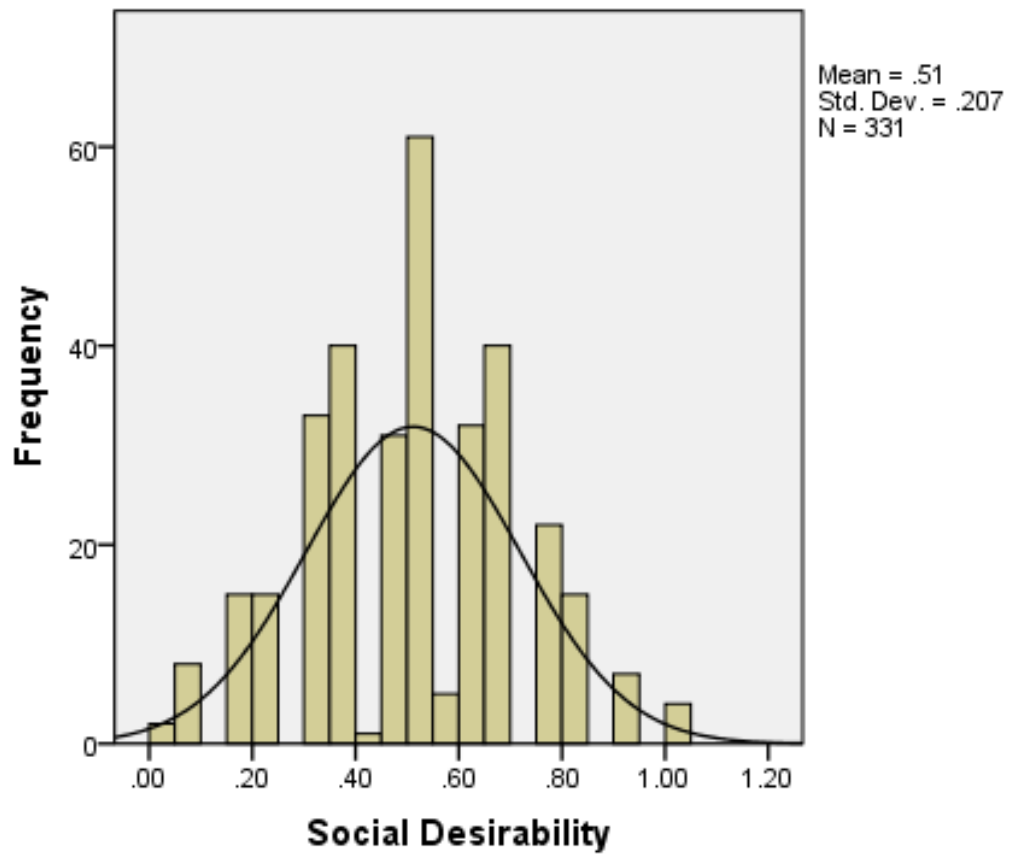


Figure 2h. Histogram showing distribution of study variable social desirability with normal curve superimposed.

(A. F. Hayes, 2009). Bryan and colleagues (2007) pointed out that a disadvantage of Baron and Kenny's causal steps method (Baron & Kenny, 1986) is its low statistical power in most situations, which can lead to failure to detect mediation effects. Hayes suggested that bootstrapping affords higher statistical power because it involves one hypothesis test instead of two. It explicitly quantifies and tests significance of the indirect effect rather than basing inferences about that effect on two separate hypothesis tests of paths that define it (IV to mediator and mediator to DV). Sobel's method (1982) directly tests the significance of the indirect effect, and is therefore more powerful, but it assumes normality in the distribution of the effect (Preacher & Hayes, 2004). The method by which bootstrapping tests significance avoids assumptions about the normality of the distribution of those effects (MacKinnon, Lockwood, & Williams, 2004).

The PROCESS macro for SPSS (A. F. Hayes, 2012) calculates summary statistics for the total and direct effects and for the paths from IV to proposed mediator (path *a*) and proposed mediator to DV (path *b*) using traditional regression methods. The indirect effect is the product of the effect of path *a* and the effect of path *b* (i.e. *ab*). To calculate the indirect effects, PROCESS uses bootstrapping to resample the original dataset, with replacement, building a new dataset and then calculating a new *ab* value. It repeats this process thousands of times (10,000 for this study) and then uses the new *ab* values to construct an empirical approximation of the sampling distribution of the indirect effect when taking a sample of size *n* (in this study *n*=331) from the original population. A bias corrected and accelerated 95% confidence interval is then generated, and if zero is not between the lower and upper bounds, then the indirect effect is not zero with 95% confidence; in other words, the indirect effect is significant (Preacher & Hayes, 2004).

Bryan (2007) pointed out that bootstrapping has long been recognized as a useful technique, but it has not often been utilized because of the intense computing requirements inherent in the numbers of resampling iterations it requires. With the introduction of macros that can be used in conjunction with standard statistical software package, such as PROCESS (A. F. Hayes, 2012) used with SPSS resampling methods can be implemented relatively easily and have been shown to generate more results that are less prone to Type II errors.

Chapter 4

RESULTS

Demographics

Five hundred and three people visited the study website between January and March, 2012. Three hundred and thirty one completed the survey and were included in the analysis. Demographic variables and information regarding participants' meditation practice are summarized in Tables 1 and 2.

Demographic Variables and Outcomes

Independent-Samples Mann-Whitney U tests showed a statistically significant correlations between meditation practice (the respondent does or does not practice some form of meditation) and the dependent variable for this study, relationship satisfaction scores ($z = 3.339, p < .001$). Although practicing meditation was significantly associated with higher levels of relationship satisfaction, the effect size was small ($r_s = 0.184$). Follow-up analyses tested associations between meditation practice and both IVs (mindfulness, nonreactivity) and proposed mediators (effective emotion regulation, empathic concern, perspective taking and positivity); all were found to be significant (all p 's < 0.05). As was found with the dependent variable, however, effect sizes for the independent variable and proposed mediators were small ($r_s = 0.180$ and below). Because effect sizes were small, meditation practice was not included as a covariate in subsequent analyses. No other possible demographic covariates were identified in preliminary analyses; therefore, all demographic variables were excluded from further analyses.

Table 1
Demographics (n = 335)

	Sample	
	Size	Percentage
Gender		
Female	252	76.1
Male	79	23.9
Age		
18-21	37	11.2
22-30	112	33.8
31-40	85	25.7
41-50	45	13.6
51-60	45	13.6
61-70 or older	5	2.1
Ethnicity		
Hispanic	41	12.4
White	235	71
Black	22	6.6
Asian	14	4.2
Native American	6	1.3
Other Ethnicity	2	0.6
Multiracial	11	3.3

Length of relationship reported on in survey		
1-5 years	180	54.4
6-10 years	66	19.3
11-15 years	35	10.6
16-20 years	13	3.9
21-30 years	19	5.7
31-40 years	18	5.4
41-50 years or longer	2	0.6
Meditation Practice		
No	190	57.4
Yes	141	42.6

Table 2

Descriptive statistics for participants reporting a meditation practice ($n=141$).

	Sample	
	Size	Percentage
Type of meditation practiced		
Transcendental Meditation	5	3.5
Centering Prayer	14	9.9
Mindfulness Meditation	44	31.2
Yoga	27	19.1
Relaxation meditation	18	12.8
Other form of meditation	9	6.4
Multiple forms not mindfulness	24	17.0
Length of meditation practice		
Less than one year	19	13.5
1-5 years	50	35.5
6-10 years	44	31.2
15-20 years	19	13.5
More than 20 years	9	6.4
Frequency of practice		
Less than once per month	12	8.5
Less than once per month and more than once per week	13	9.2
Once per week	28	19.9

Several times per week	53	37.6
Once per day	19	13.5
More than once per day	16	11.3
<hr/>		
Expertise at meditation (self report)		
Novice	96	68.1
Experienced meditator	42	29.8
Expert meditator	3	2.1
<hr/>		
Does your practice have an effect on your relationship?		
Yes	111	78.7
No	30	21.3
<hr/>		

Relationships Between Study Variables

Social desirability was significantly correlated with all study variables ($p < 0.05$). Thus, social desirability scores were entered as covariates in all subsequent analyses.

Correlational analyses indicated that, as predicted, total mindfulness scores and proposed mediators are all significantly associated with one another. Mindfulness was shown to be associated with effective emotion regulation ($r_s = 0.719, p < 0.01$), empathic concern ($r_s = 0.186, p < 0.01$), perspective taking ($r_s = 0.352, p < 0.01$) and positivity ratio ($r_s = 0.631, p < 0.01$). Total mindfulness scores were also significantly associated with relationship satisfaction ($r_s = 0.281, p < 0.01$).

Also as predicted, nonreactivity was shown to be significantly associated with relationship satisfaction ($r_s = 0.216, p < 0.01$), effective emotion regulation ($r_s = 0.46, p < 0.01$), perspective taking ($r_s = 0.279, p < 0.01$) and positivity ratio ($r_s = 0.457, p < 0.01$). Contrary to prediction, nonreactivity did not show a significant association with empathic concern ($r_s = 0.030, p > 0.05$). The largest effect sizes were between mindfulness and effective emotion regulation ($r_s = 0.719$) and mindfulness and positivity ratio ($r_s = 0.631$). Table 3 displays the correlational results and descriptive statistics for each variable.

Remaining mindfulness facets were also significantly correlated with relationship satisfaction as follows: observe ($r_s = 0.219, p < 0.01$), describe ($r_s = 0.247, p < 0.01$), nonjudge ($r_s = 0.112, p < 0.05$), awareness ($r_s = 0.188, p < 0.01$). Table 4 displays correlational results and descriptive statistics for each of the mindfulness facets.

Table 3

Mean scores, standard deviations, alpha coefficients and zero-order correlations among variables in study ($n = 331$)

	1	2	3	4	5	6	7	8
1. Mindfulness total	1.000	0.605**	0.281**	0.186**	0.352**	0.719**	0.631**	0.362**
2. Nonreactivity		1.000	0.216**	0.030	0.279**	0.457**	0.453**	0.266**
3. Relationship Satisfaction			1.00	0.193**	0.266**	0.271**	0.294**	0.200**
4. Empathic Concern				1.000	0.359**	0.122*	0.148**	0.178**
5. Perspective Taking					1.000	0.294**	0.280**	0.231**
6. Effective Emotion Regulation						1.000	0.758**	0.410**
7. Positivity Ratio							1.000	0.451**
8. Social Desirability								1.000
M	3.576	3.382	3.046	3.097	2.831	3.899	2.110	0.511
SD	0.534	0.801	0.876	0.598	0.612	0.649	0.927	0.207
α	0.909	0.862	0.857	0.763	0.800	0.951	0.812	0.679

Note: **. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Table 4

Mean scores, standard deviations and zero-order correlations between relationship satisfaction and mindfulness facets ($n = 331$)

	1	2	3	4	5	6
1. Relationship Satisfaction	1.000	0.219**	0.247**	0.112*	0.216**	0.188**
2. Observe		1.000	0.249**	-0.012	0.201**	0.131*
3. Describe			1.000	0.226**	0.301**	0.344**
4. Nonjudge				1.000	0.316**	0.383**
5. Nonreactivity					1.000	0.251**
6. Act with Awareness						1.000
M	3.046	3.738	3.706	3.537	3.382	3.491
SD	0.876	0.811	0.775	1.039	0.801	0.848

Note: * $p < 0.05$, ** $p < 0.01$, two tailed.

Results for Mediation Analyses

Mindfulness as Independent Variable

Effective Emotion Regulation as Mediator. It was hypothesized that effective emotion regulation (i.e. higher levels of effective emotion regulation), empathy (i.e. empathic concern and perspective taking); and positivity ratio (i.e. the ratio of positive to negative emotion) would be paths through which mindfulness is associated with relationship satisfaction. To test this mediation model, bootstrapping (discussed above) was used. Mediation results are displayed in Table 5 and are further illustrated in Figures 3a-3d. As shown, the total effect of mindfulness on relationship satisfaction was significant ($\beta=0.246, p<0.001$).

Higher mindfulness scores significantly predicted higher levels of effective emotion regulation ($\beta =0.666, p<0.001$); however, effective emotion regulation did not significantly predict relationship satisfaction ($\beta =0.042, p=0.59$). Bootstrap estimation of the indirect effect of mindfulness on relationship satisfaction through effective emotion regulation was not significant ($\beta =0.028, p=0.59$). These findings indicate that although mindfulness is related to both effective emotion regulation and relationship satisfaction, emotion regulation is not a mediator of the association between mindfulness and relationship satisfaction.

These results were surprising because much empirical evidence has shown that effective emotion regulation is important to relationships. In a recent publication, Coffey, Hartman and Fredrickson (2010) reported findings that provide insight into this issue. They hypothesized that several of the concepts assessed by the FFMQ mindfulness

Table 5.

Mediation of the effects of mindfulness and mindfulness facet nonreactivity on relationship satisfaction through proposed mediators

IV	Proposed Mediator	DV	Total effect of IV on DV ^a	Effect of IV on M ^b	Effect of M on DV ^c	Indirect effect of IV on DV thru M	Percent Mediation ^d	BS Lower CI	BS Upper CI
Mindfulness	EmReg	RelSat	0.246***	0.666***	0.042	0.028	11.371%	-0.148	0.239
Mindfulness	EmpCon	RelSat	0.246***	0.080	0.145**	0.012	4.715%	-0.006	0.062
Mindfulness	PersTak	RelSat	0.246***	0.266***	0.217***	0.058**	23.464%	0.038	0.185
Mindfulness	PosRat	RelSat	0.246***	0.526***	0.165*	0.087*	35.280%	0.027	0.267
Nonreactivity	EmReg	RelSat	0.198***	0.338***	0.134*	0.045	22.874%	-0.003	0.114
Nonreactivity	EmCon	RelSat	0.198***	-0.021	0.166**	0.003	1.761%	-0.035	0.024
Nonreactivity	PersTak	RelSat	0.198***	0.234***	0.230***	0.054**	27.182%	0.020	0.122
Nonreactivity	PosRat	RelSat	0.198***	0.338***	0.206***	0.069**	35.165%	0.027	0.142
Ad Hoc Analyses									
Observe	EmReg	RelSat	0.206***	0.100*	0.168**	0.017	8.155%	-0.0004	0.058
Act	EmReg	RelSat	0.114	0.516***	0.179*	0.092*	81.02%	0.0196	0.179

Note. IV=Independent variable; M=Mediator; DV=Dependent variable; BS=Bootstrapped; EmReg=Effective emotion regulation; RelSat=Relationship satisfaction; EmpCon=Empathic concern; PersTak=Perspective taking; PosRat=Positivity ratio; Act=Act with awareness; CI=Confidence interval; ^aStandardized regression beta weight predicting the DV from the IV. ^bStandardized regression beta weight predicting the M from the IV. ^cStandardized regression beta weight of the M predicting the DV controlling for the IV. ^dCalculated using standardized regression beta weights. 95% Confidence intervals are bias controlled and accelerated; Bootstrap resamples=10,000. *p<0.05, **p<0.01, ***p<0.001.

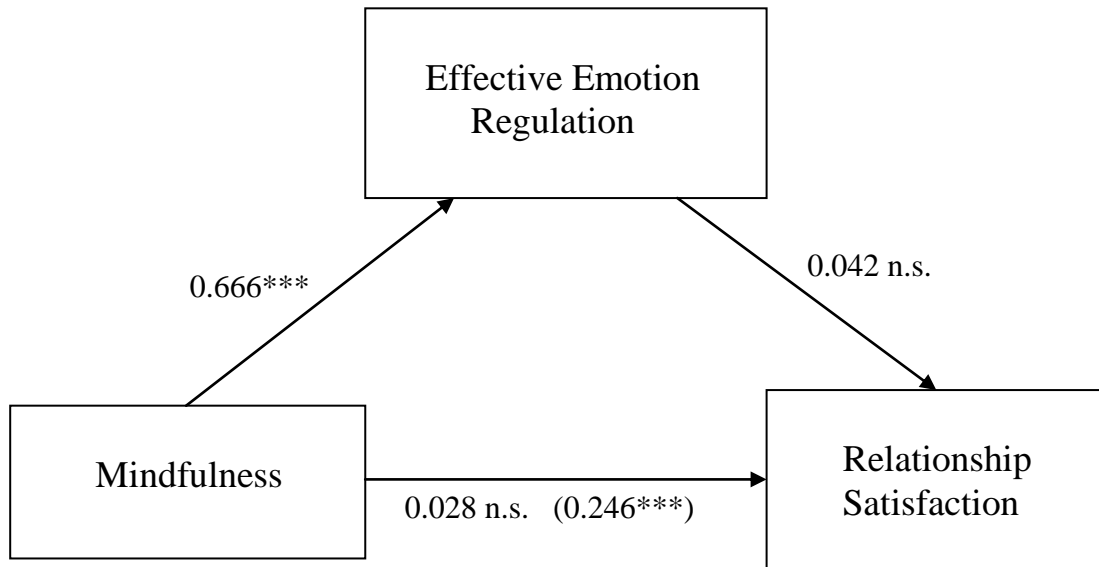


Figure 3a. The effects of mindfulness on relationship satisfaction, mediated by effective emotion regulation. The values in parentheses are the total effects of mindfulness on relationship satisfaction prior to the inclusion of the mediator variable into the model.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

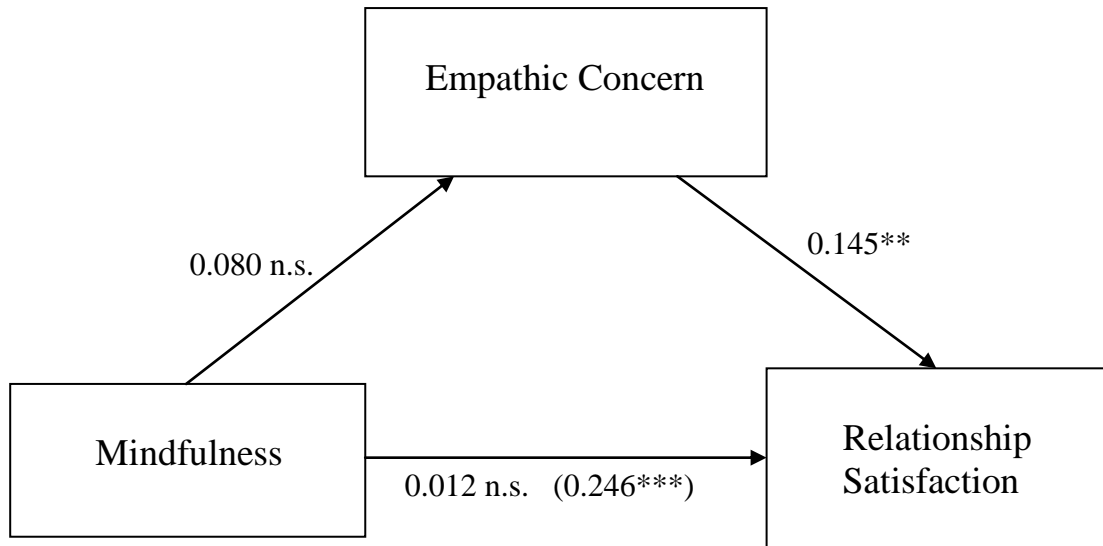


Figure 3b. The effects of mindfulness on relationship satisfaction, mediated by empathic concern. The values in parentheses are the total effects of mindfulness on relationship satisfaction prior to the inclusion of the mediator variable into the model. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

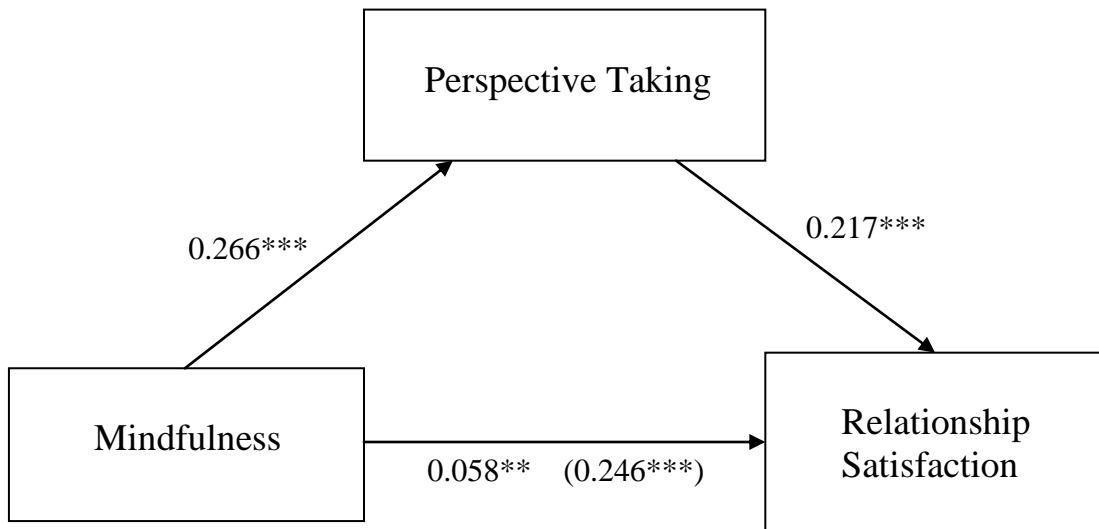


Figure 3c. The effects of mindfulness on relationship satisfaction, mediated by perspective taking. The values in parentheses are the total effects of mindfulness on relationship satisfaction prior to the inclusion of the mediator variable into the model.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

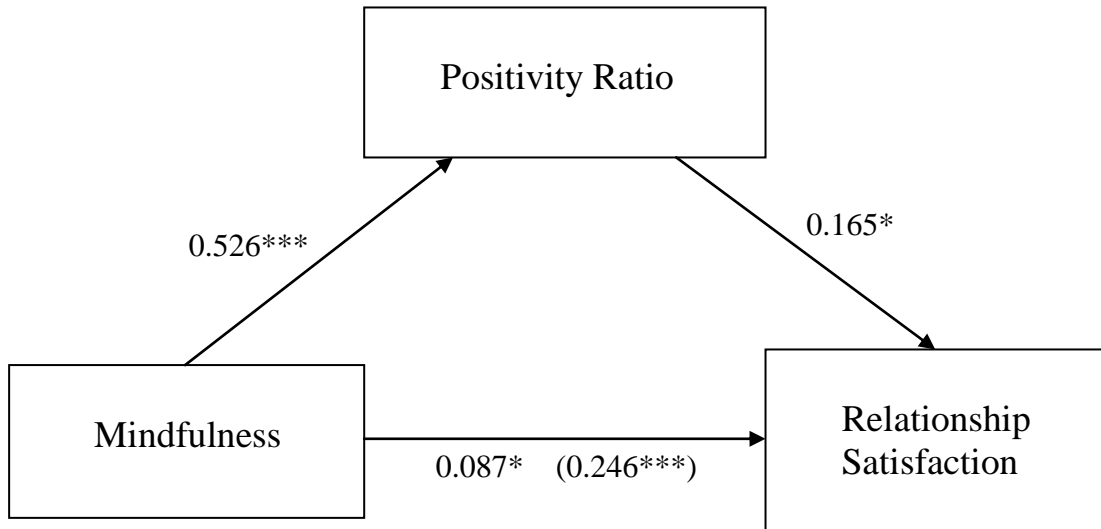


Figure 3d. The effects of mindfulness on relationship satisfaction, mediated by positivity ratio. The values in parentheses are the total effects of mindfulness on relationship satisfaction prior to the inclusion of the mediator variable into the model. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

measure and DERS emotion regulation measure are the same. They empirically examined the FFMQ and DERS for conceptual overlap and found that present-centered attention (FFMQ subscale “observe”) and awareness (FFMQ subscale “act with awareness”) are the only two concepts that are distinct between the two measures. In light of this information, and to better understand the relationship between mindfulness, effective emotion regulation and relationship satisfaction, two ad hoc mediation analyses were performed. First, mindfulness facet observe, which measures present-centered attention, was entered into the model as IV with effective emotion regulation as mediator. Second, mindfulness facet act with awareness, which measures mindful awareness, was entered into the model as IV with effective emotion regulation as mediator.

Results of the first ad hoc analysis are shown in Table 5 and Figure 4a. Higher present-centered attention scores were a significant predictor of effective emotion regulation ($\beta = 0.100, p < 0.05$) and emotion regulation was a significant predictor of relationship satisfaction while controlling for attention ($\beta = 0.168, p < 0.01$). However, the indirect effect of present-centered attention on relationship satisfaction through effective emotion regulation was not significant at $0.0168 (0.100 * 0.017)$, ($p = 1132$, 95% lower confidence interval = -0.0004 , 95% upper confidence interval = 0.0576). Although present-centered attention is important to effective emotion regulation and effective emotion regulation is important to relationship satisfaction, effective emotion regulation is not a mediator of the association between present-centered awareness and relationship satisfaction.

The second ad hoc analysis examined mindfulness facet act with awareness as the IV in the emotion regulation as mediator model. Results are shown in Table 5 and Figure 4b.

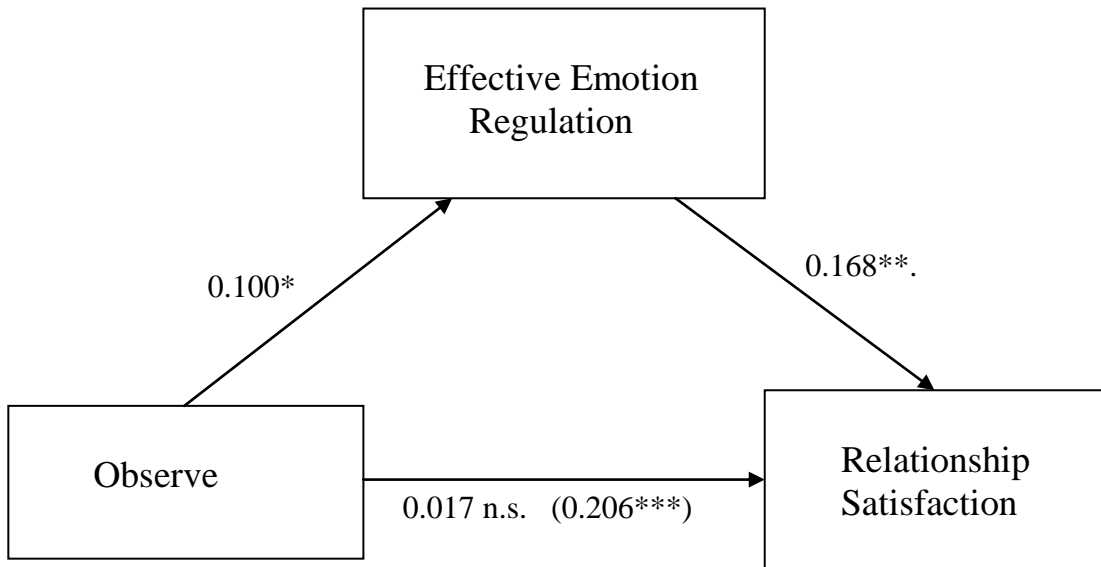


Figure 4a. Ad hoc mediation of the effects of mindfulness facet observe on relationship satisfaction, mediated by effective emotion regulation. The values in parentheses are the total effects of mindfulness facets on relationship satisfaction prior to the inclusion of the mediator variable into the model. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

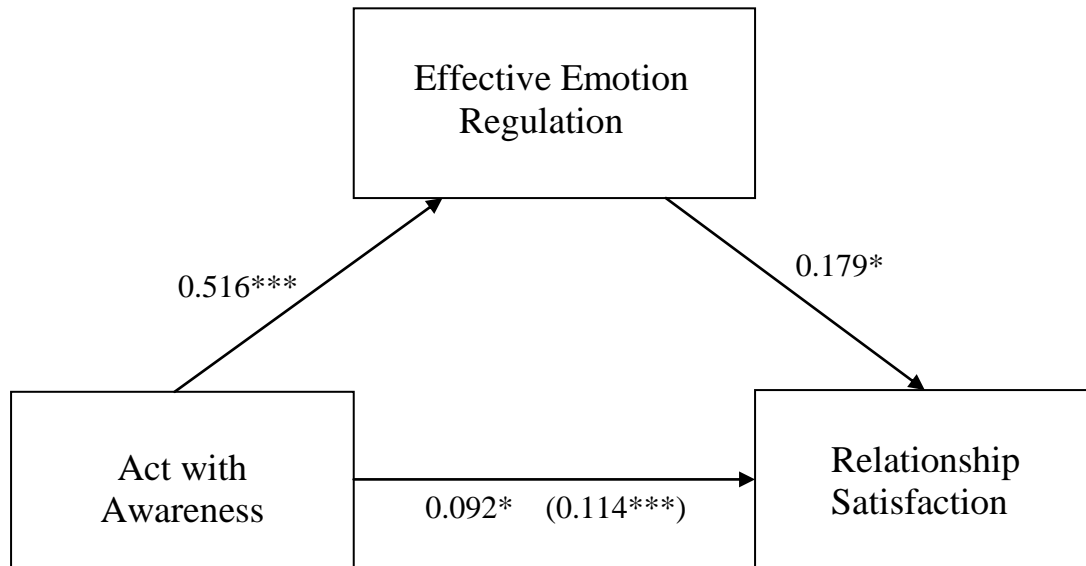


Figure 4b. Ad hoc mediation of the effects of mindfulness facet act with awareness on relationship satisfaction mediated by effective emotion regulation. The values in parentheses are the total effects of mindfulness facets on relationship satisfaction prior to the inclusion of the mediator variable into the model. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Higher mindful awareness scores were a significant predictor of effective emotion regulation ($\beta = 0.516, p < 0.001$) and emotion regulation was a significant predictor of relationship satisfaction while controlling for mindful awareness ($\beta = 0.179, p < 0.05$). The indirect effect of mindful awareness on relationship satisfaction through perspective taking was significant at 0.092 ($0.516 * 0.179$), (95% lower confidence interval = 0.0196, 95% upper confidence interval = 0.1792). This indirect effect represents total mediation, as the remaining direct effect of mindful awareness on relationship satisfaction was no longer significant ($0.022, p = .7442$). The indirect effect was 81.02% of the total effect, suggesting that emotion regulation is a very important process by which mindful awareness influences relationship satisfaction.

In summary, using mindfulness and emotion regulation measures that may overlap significantly, effective emotion regulation was not shown to be a mediator for the association between mindfulness as measured by the full FFMQ scale and relationship satisfaction. Nor was it a mediator of the association between the mindfulness facet observe and relationship satisfaction. Effective emotion regulation completely mediated the association between mindfulness facet act with awareness and relationship satisfaction.

Empathic Concern as Mediator. The role of empathy as a mediator of the association between mindfulness and relationship satisfaction was tested in two parts. Mediation results are displayed in Table 5 and are further illustrated in Figure 3b and 3c. In the first part of this analysis, higher mindfulness scores were not a significant predictor of empathic concern ($\beta = 0.089, p = 0.173$); however, empathic concern was a significant predictor of relationship satisfaction ($\beta = 0.145, p < 0.01$). Bootstrap estimation of the

indirect effect of mindfulness on relationship satisfaction through empathic concern was not significant ($\beta = .02, p = 0.24$). Although empathic concern is associated with relationship satisfaction, it is not a mediator of the association between mindfulness and relationship satisfaction.

These findings support earlier work done by this author in which mindfulness was unrelated to empathic concern. However, given the long Buddhist tradition of mindfulness as a path to compassion, they remain surprising. Buddhist tradition however, notes that meditation *practice* leads to compassion (Hanh, 1998; Kornfield, 1993). For that reason, it was thought that possibly mindfulness meditation practice might play a role as moderator in this process. Additionally, recent work has linked mindfulness to psychological distress in cases where emotional dysregulation was high (Coffey, et al., 2010); for that reason emotion regulation subscales were explored as potential moderators of the process as well.

Ad hoc moderated mediation analyses were conducted to determine (a) whether the indirect effect of mindfulness on relationship satisfaction through empathic concern depends on mindfulness meditation practice or effective emotion regulation and (b) whether any direct effect that remains after accounting for empathic concern depends on those moderators as well. In order to test these mediation and moderation analyses simultaneously, the conditional indirect effect model posited by Preacher et al. (2008) was used. The proposed model can be seen in Figure 5. Analyses were conducted using PROCESS and SPSS (A. F. Hayes, 2012).

Analyses to examine mindfulness meditation practice were conducted with a subset of the total dataset ($n = 141$) consisting of individuals that had some type of meditation

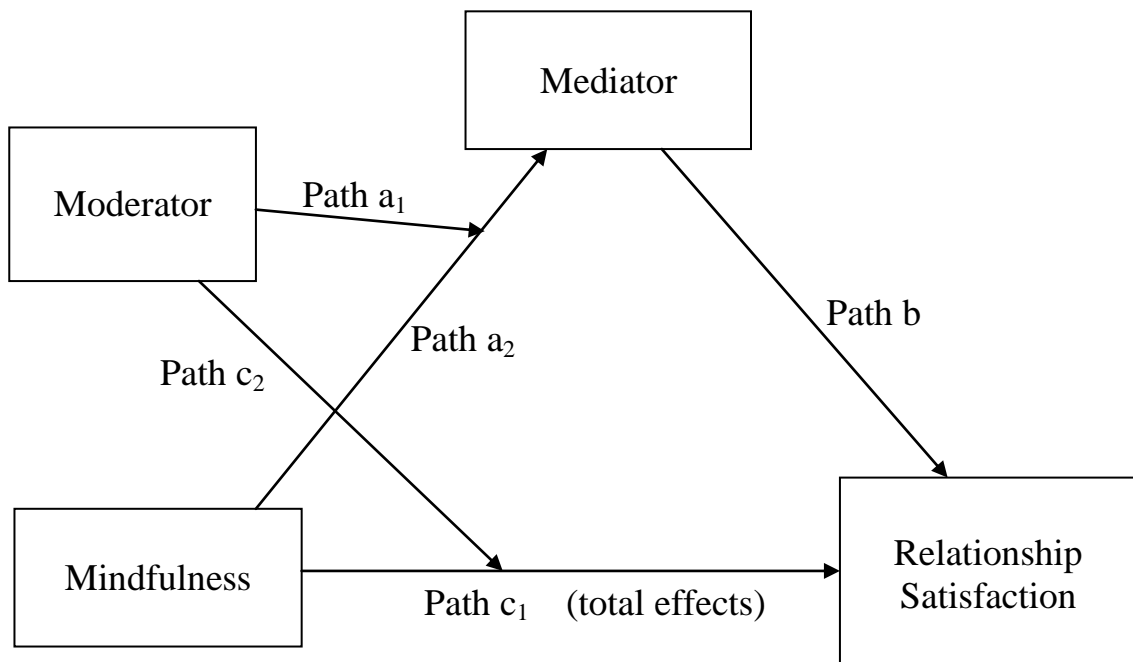


Figure 5. Conditional effects model. Path a_1 is the effect of the IV on the mediator, path a_2 is the conditional effect of the moderator on the indirect effect. Path b is the effect of the mediator on the DV, path c_1 is the direct effect, and path c_2 is the conditional effect of the moderator on the direct effect.

Table 6.

Moderated mediation of mindfulness and facet nonreactivity on relationship satisfaction through proposed mediators.

IV	Proposed Moderator	Proposed Mediator	DV	Moderation of indirect effects ^a	Moderation of direct effects ^b	Conditional indirect effects of IV on DV thru M ^c
Mindfulness	Mindfulness Practice	EmpCon	RelSat	0.112*	-0.079 n.s.	Significant only for practice=yes
Mindfulness	Emotional Awareness	EmpCon	RelSat	0.144**	0.024 n.s.	Significant only at the highest levels of emotional awareness
Nonreactivity	EmReg	EmpCon	RelSat	0.168**	-0.038 n.s.	Significant only at lowest levels of EmReg

Note. IV=Independent Variable; M=Mediator; DV=Dependent Variable; EmpCon=Empathic concern; EmReg=Emotion regulation; RelSat=Relationship satisfaction; BS=Bootstrapped. ^aStandardized regression beta weight of the interaction term in the indirect effects model. ^bStandardized regression beta weight of the interaction term in the direct effects model. ^cConditional indirect effects of IV on DV through M moderated by highest order interaction, calculated using standardized regression beta weights. 95% Confidence intervals are bias controlled and accelerated. Bootstrap resamples=10,000. *p<0.05, **p<0.01.

practice. Moderation of the indirect effects was found ($\beta = 0.112, p < 0.05$) (see Table 6), however, moderation of the direct effects was not found ($\beta = 0.079, p = 0.13$). For individuals with a mindfulness practice, mindfulness was positively associated with empathic concern. For those without a mindfulness practice, the association was negative. A graph showing the interaction can be found in Figure 6a. To further probe the effects of this interaction, conditional indirect effects of mindfulness on relationship satisfaction through empathic concern at the mean and plus/minus one standard deviation from the mean of mindfulness practice (mean centered) were examined. Conditional indirect effects were not significant at any of these three values of mindfulness practice; however the trend was toward a stronger effect in individuals with a mindfulness practice. Moderation of the direct effect was not found.

Analyses to examine emotion regulation as a moderator included tests of the full emotion regulation measure and each of its subscales. Of the seven models tested, moderation of the indirect effect was found only for the emotion regulation subscale measuring emotional awareness ($\beta = 0.144, p < 0.05$) (see Table 6), moderation of the direct effects was not found ($\beta = 0.024, p = 0.65$). For those individuals with lower levels of emotional awareness, mindfulness scores were negatively associated with empathic concern. For those with medium and higher levels of emotional awareness, mindfulness scores were positively associated with empathic concern. A graph showing the interaction is shown in Figure 6b. To further probe the effects of this interaction, conditional indirect effects of awareness on relationship satisfaction through empathic concern at the mean and plus/minus one standard deviation from the mean of emotional awareness (mean centered) were examined. Conditional indirect effects were not significant although they

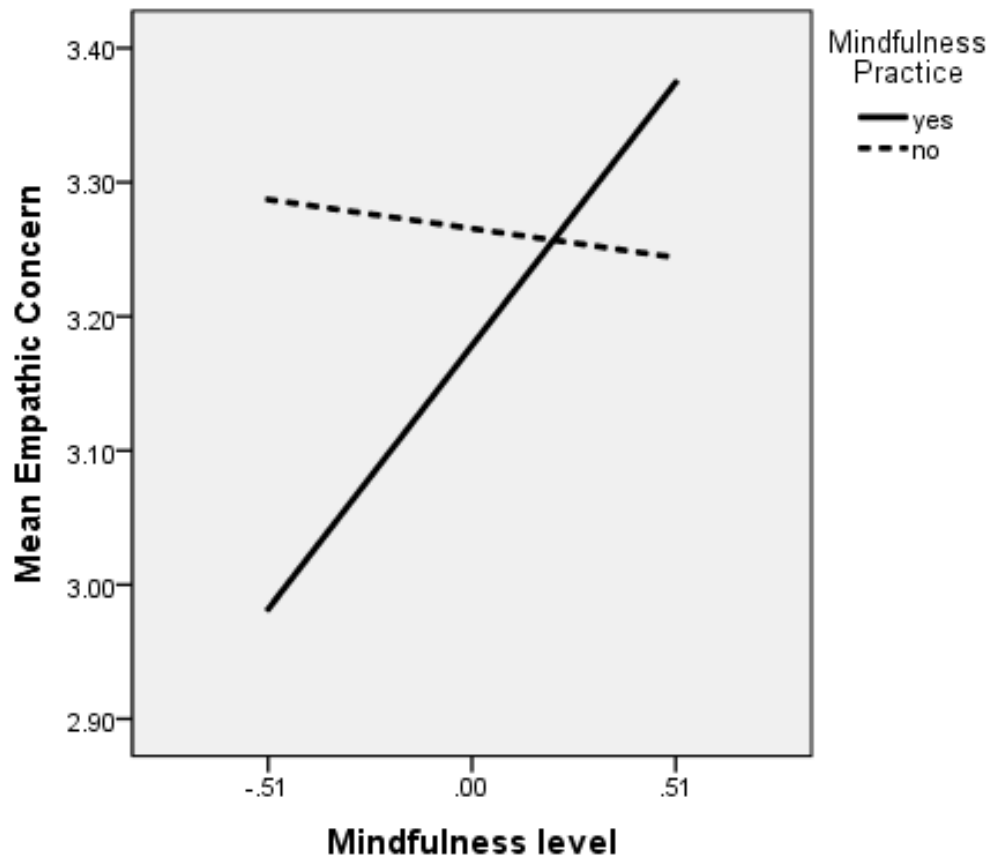


Figure 6a. Interaction effects of (mindfulness practice on the relationship between mindfulness and empathic).

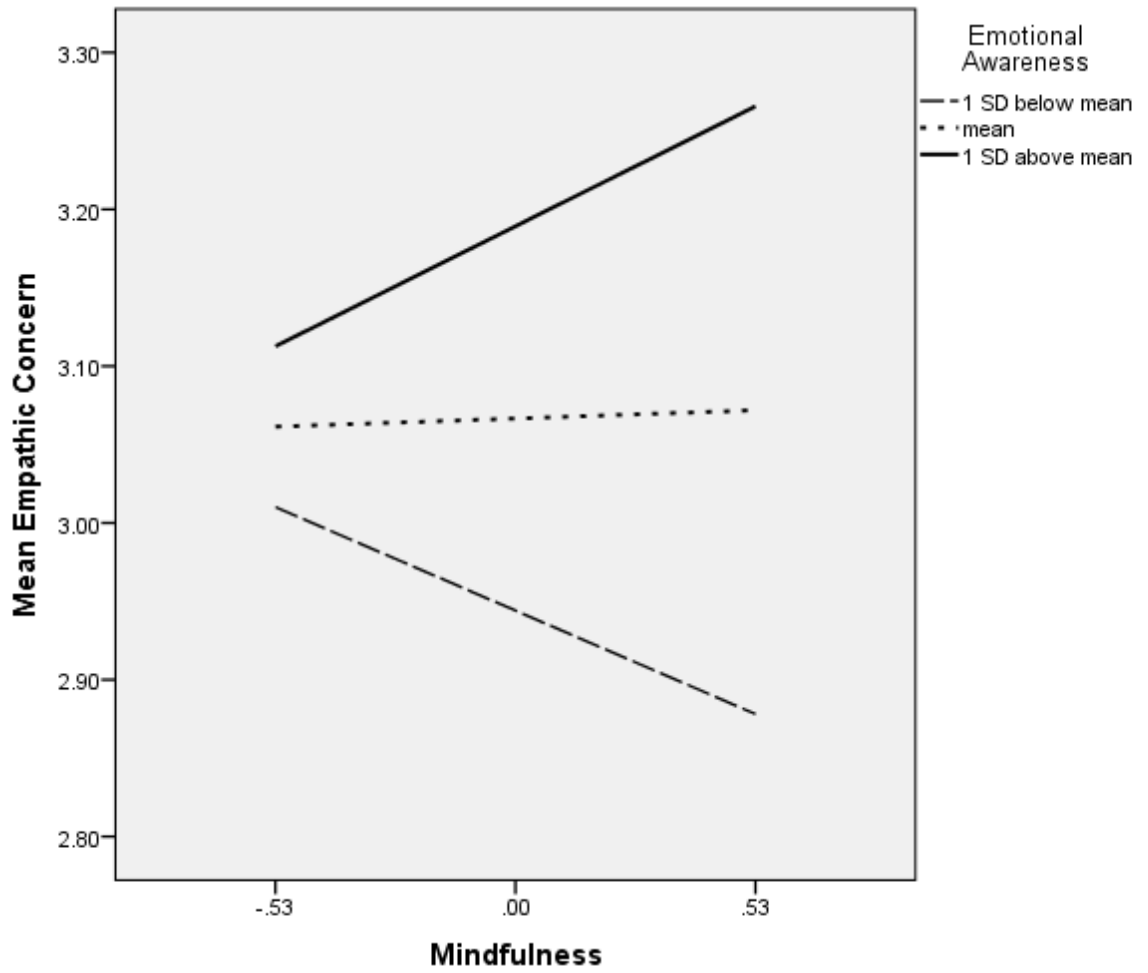


Figure 6b. Interaction effects of effective emotion regulation subscale awareness on the relationship between mindfulness and empathic concern.

approached significance at the highest values of emotional awareness. This indicates that empathic concern may become a path through which mindfulness influences relationship satisfaction when individuals have higher levels of emotional awareness. Moderation of the direct effect was not found.

Perspective Taking as Mediator. In the second part of the empathy analysis, the role of perspective taking as a mediator was tested. Mediation results are displayed in Table 5 and are further illustrated in Figure 3c. Higher mindfulness scores were a significant predictor of perspective taking ($\beta = 0.266, p < 0.001$) and perspective taking was a significant predictor of relationship satisfaction while controlling for mindfulness ($\beta = 0.217, p < 0.001$). The indirect effect of mindfulness on relationship satisfaction through perspective taking was 0.058 ($0.266 * 0.217$), and the confidence interval does not include zero (95% lower confidence interval = 0.0380, 95% upper confidence interval = 0.1845) which indicates that this value is significant (see explanation of bootstrapping, above). However, it did not represent complete mediation, as there was significant remaining direct effect of mindfulness on relationship satisfaction ($0.189, p < 0.001$). The indirect effect was 23.46% of the total effect, suggesting that although perspective taking is important in accounting for higher levels of relationship satisfaction, other variables may also be important.

The results of the mediation analysis for empathy as a path through which mindfulness affects relationship satisfaction were mixed. In general, empathic concern was not a mediator, however in situations where participants scored high in emotional awareness and when they reported having a meditation practice, the mediation effects of

empathic concern rose to a significant level. Perspective taking was found to be a partial mediator.

Positivity Ratio as Mediator. In the final mediation analysis of the effects of mindfulness on relationship satisfaction, the role of positivity ratio as a mediator was tested. Mediation results are displayed in Table 5 and are further illustrated in Figure 3d. Higher mindfulness scores were a significant predictor of higher positivity ratio ($\beta = 0.526$ $p < 0.001$) and higher positivity ratio was a significant predictor of relationship satisfaction while controlling for mindfulness ($\beta = 0.165$, $p < 0.05$). The indirect effect of mindfulness on relationship satisfaction through positivity ratio was 0.087 ($0.526 * 0.165$), and this value was significant (95% lower confidence interval = 0.0272, 95% upper confidence interval = 0.2672). However, it did not represent complete mediation, as there was significant remaining direct effect of mindfulness on relationship satisfaction (0.160, $p < 0.05$). The indirect effect was 35.37% of the total effect. These findings suggest that although positivity ratio accounts for a moderate amount of the total effect, it does not completely mediate the association between mindfulness and relationship satisfaction, and other variables may also be important.

Nonreactivity as Independent Variable

It was also predicted that effective emotion regulation, empathy and positivity ratio would also be paths through which nonreactivity is associated with relationship satisfaction. Mediation results are displayed in Table 5 and are further illustrated in Figure 7a-7d. As shown, the total effect of nonreactivity on relationship satisfaction was significant ($\beta = 0.20$, $p < 0.001$).

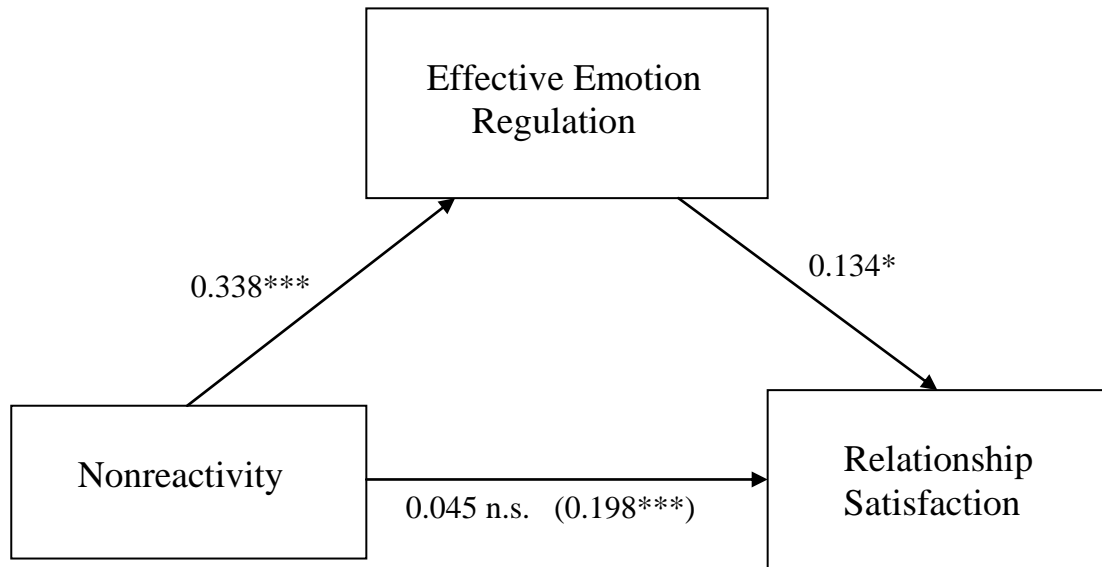


Figure 7a. The effects of nonreactivity on relationship satisfaction mediated by effective emotion regulation. The values in parentheses are the total effects of nonreactivity on relationship satisfaction prior to the inclusion of the mediator variable into the model.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

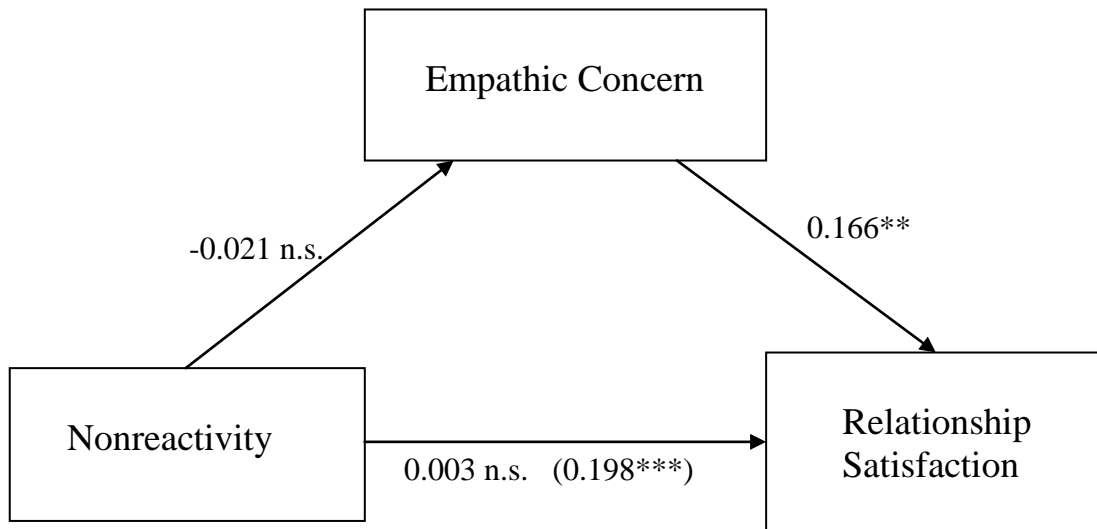


Figure 7b. The effects of nonreactivity on relationship satisfaction mediated by empathic concern. The values in parentheses are the total effects of nonreactivity on relationship satisfaction prior to the inclusion of the mediator variable into the model. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

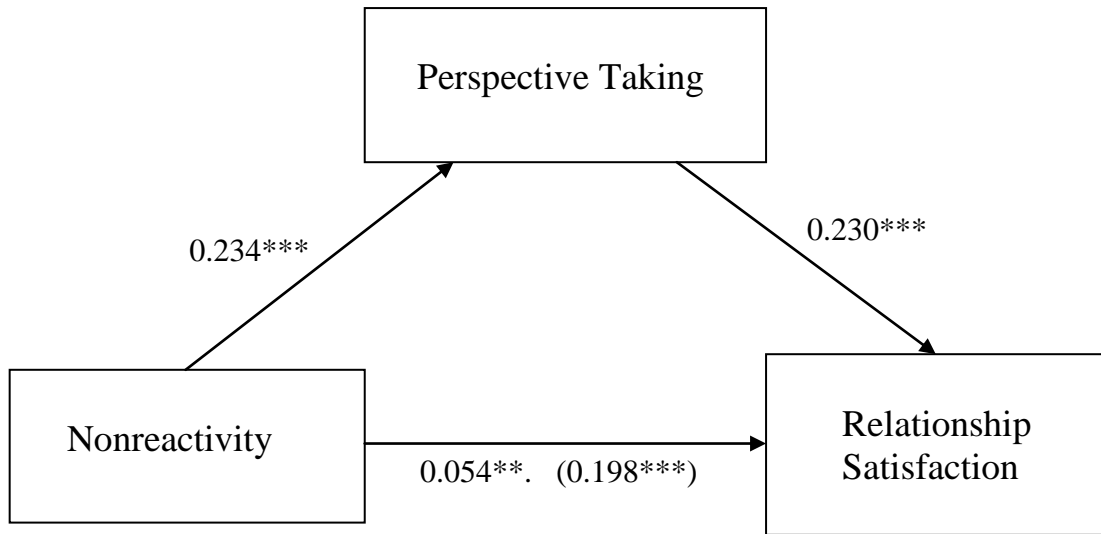


Figure 7c. The effects of nonreactivity on relationship satisfaction mediated by perspective taking. The values in parentheses are the total effects of nonreactivity on relationship satisfaction prior to the inclusion of the mediator variable into the model.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

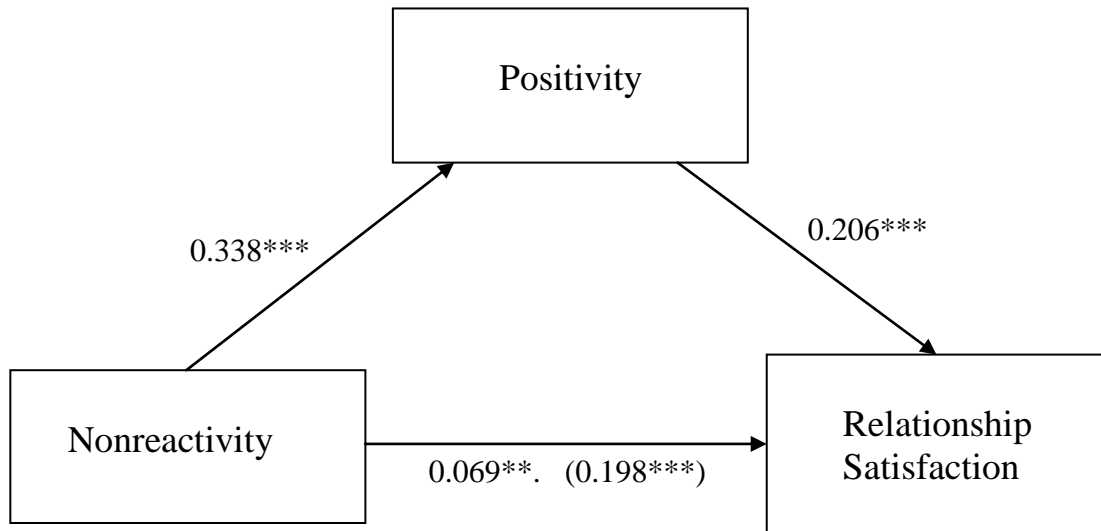


Figure 7d. The effects of nonreactivity on relationship satisfaction mediated by positivity ratio. The values in parentheses are the total effects of nonreactivity on relationship satisfaction prior to the inclusion of the mediator variable into the model. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Effective Emotion Regulation as Mediator. Effective emotion regulation's role as a mediator of the association between nonreactivity and relationship satisfaction was tested (see table 5 and figure 6a). Increases in nonreactivity significantly predicted increases in emotion regulation ($\beta = 0.338, p < 0.001$) and increases in emotion regulation significantly predicted increases in relationship satisfaction while controlling for nonreactivity ($\beta = 0.134, p < .05$). However, the indirect effect of nonreactivity on relationship satisfaction through emotion regulation was not significant ($\beta = 0.045, 95\%$ lower confidence interval = $-0.0029, 95\%$ upper confidence interval = 0.1141). Thus, although effective emotion regulation is related to both mindfulness and relationship satisfaction, it is not a mediator of that association.

Empathic Concern as Mediator. Empathy's role as a mediator of the association between nonreactivity and relationship satisfaction was again tested in two parts. Mediation results are displayed in Table 5 and are further illustrated in Figures 3b and c. Findings for nonreactivity followed the same pattern as those of full scale mindfulness. Higher nonreactivity scores were not a significant predictor of empathic concern ($\beta = -0.021, p = 0.710$). Empathic concern was a significant predictor of relationship satisfaction ($\beta = 0.166, p < 0.01$). Bootstrap estimation of the indirect effects of nonreactivity on relationship satisfaction through empathic concern was not significant ($\beta = 0.003, 0.724$).

In an effort to understand nonreactivity more clearly, ad hoc analyses were conducted, examining whether effective emotion regulation as measured by the DERS would moderate the indirect or direct effects of nonreactivity on relationship satisfaction through empathic concern.

Moderated mediation analyses were conducted for emotion regulation entering this variable into the mediation model as a potential moderator. Moderation of the indirect effect was found for the full scale emotion regulation measure ($\beta = 0.168, p < 0.01$) (see table 6). For those individuals with low and average levels of emotion regulation, nonreactivity scores were negatively associated with empathic concern scores. For those with high levels of emotion regulation, nonreactivity scores were positively associated with empathic concern levels increased. A graph showing the interaction is shown in Figure 8. To further probe the effects of this interaction, conditional indirect effects of mindfulness on relationship satisfaction through empathic concern at the mean and plus/minus one standard deviation from the mean of effective emotion regulation (mean centered) were examined. Indirect effects were only significant at the lowest level of effective emotion regulation scores (0.040, 95% lower confidence interval = 0.0063, 95% upper confidence interval = 0.1083) and in the negative direction. This not only indicates that that empathic concern is only a path through which nonreactivity influences relationship satisfaction when individuals have a high level of emotional dysregulation, but that the satisfaction level is lowered in these people.

Perspective Taking as Mediator

The effects of perspective taking as a mediator were tested. Higher nonreactivity was a significant predictor of perspective taking ($\beta = 0.234, p < .001$) and perspective taking was a significant predictor of relationship satisfaction while controlling for nonreactivity ($\beta = 0.230, p < .001$) (see table 5). The indirect effect of nonreactivity on relationship

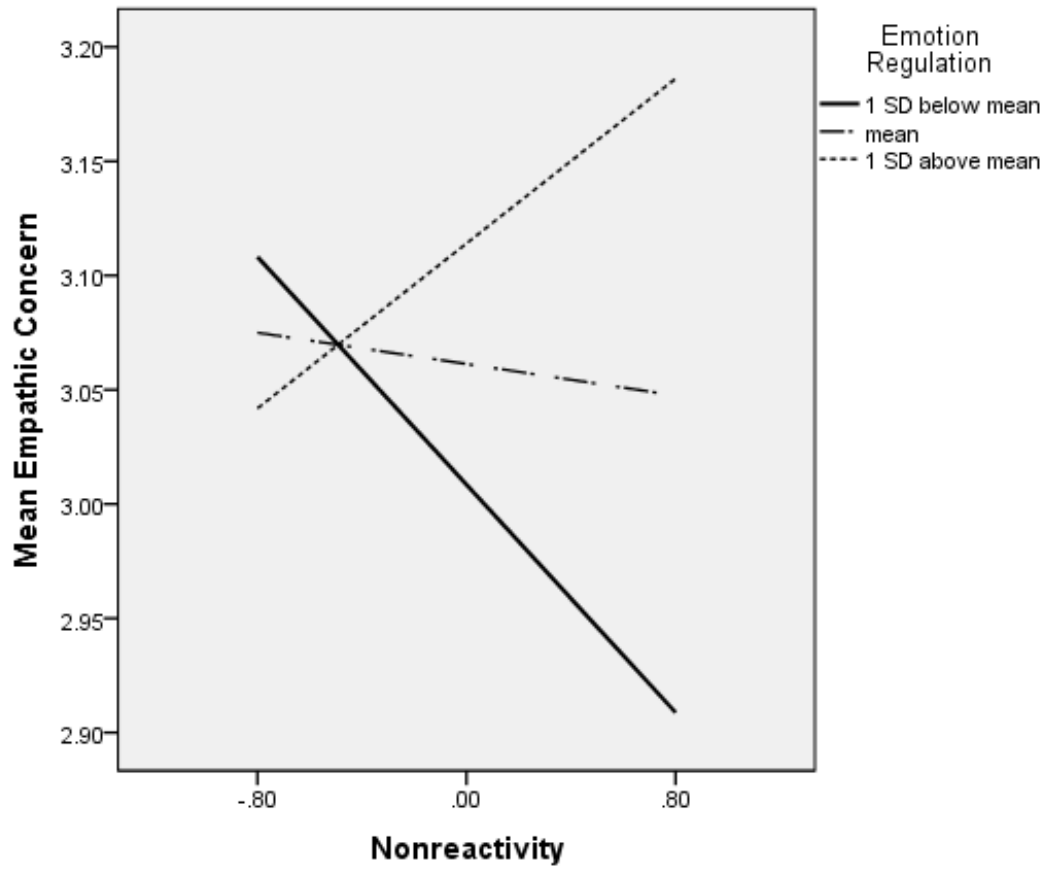


Figure 8. Interaction effects of effective emotion regulation on the relationship between nonreactivity and empathic concern.

satisfaction through perspective taking was 0.054, a significant effect (95% lower confidence interval = 0.0204, 95% upper confidence interval = 0.1222). The indirect effect did not represent complete mediation, as there was significant remaining direct effect of nonreactivity on relationship satisfaction ($\beta = 0.198, p < 0.01$). The indirect effect was 27.18% of the total effect, suggesting that although perspective taking is important in accounting for higher levels of relationship satisfaction, other variables may also be important.

Positivity Ratio as Mediator. Positivity ratio's role in the association between nonreactivity and relationship satisfaction was tested. Mediation results are displayed in Table 5 and are further illustrated in Figure 4d. Nonreactivity was a significant predictor of positivity ratio ($\beta = 0.338, p < 0.001$) and positivity ratio was a significant predictor of relationship satisfaction while controlling for nonreactivity ($\beta = 0.206, p < 0.001$). The indirect effect of nonreactivity on relationship satisfaction through positivity ratio was 0.069, a significant effect (95% lower confidence interval = 0.0273, 95% upper confidence interval = 0.1419). The indirect effect did not represent complete mediation as there was remaining direct effect of ($\beta = 0.128, p < 0.05$). The indirect effect was 35.17% of the total effect. This suggested that although positivity ratio is important in accounting for higher levels of relationship satisfaction, other variables may also be important.

Summary

Hypothesis 1 was supported. Independent variables, mindfulness and nonreactivity were significantly correlated with the dependent variable, relationship satisfaction. Independent variables were also significantly correlated with all proposed mediators.

Hypothesis 2 was partially supported. Surprisingly, effective emotion regulation did not mediate the association with relationship satisfaction when mindfulness, nonreactivity or the mindfulness facet observe (mindful attention) were entered into the model as independent variables. However, when the mindfulness facet act with awareness (mindful awareness) was entered into the model as independent variable, effective emotion regulation completely moderated the association. This was one of the strongest effects seen in the current study. For both mindfulness and nonreactivity, the cognitive component of empathy, perspective taking, was found to partially mediate the association with relationship satisfaction, accounting for 23.46% and 27.18% of the mediation effects, respectively. For the affective component of empathy, empathic concern, simple mediation analysis showed no mediation effects, however, by examining emotion regulation as moderator, findings showed that when individuals are high in emotional *dysregulation*, empathic concern does mediate the nonreactivity-relationship satisfaction association, in other situations, it does not. And finally, for both IVs, positivity ratio partially mediated the IV-DV association, accounting for 35.16% of the mediation effects in both cases.

Chapter 5

DISCUSSION

Discussion of the Results

The current study adds to the emerging literature on mindfulness and relationships in two ways. First, these findings contribute to a more precise understanding of the mechanisms by which mindfulness influences relationships. Second, the use of a large, diverse and demographically representative data set allows for greater generalizability of the current findings, as well as providing a snapshot of mindfulness and relationship satisfaction in a diverse, non-college-associated group of adults.

This study replicates findings of previous correlational research. Results demonstrated that in this population, mindfulness was positively correlated with relationship satisfaction as well as processes that are thought to be important to relationship satisfaction: effective emotion regulation, empathy and positive affect. Significant correlations were found between mindfulness and all of these other variables. The next step in understanding the mechanisms of mindfulness' influence on relationship satisfaction was to ask "How do those processes work?" Mediation analysis was used to determine whether effective emotion regulation, empathy, and positivity are processes through which mindfulness influences relationship satisfaction.

Although the effect of mindfulness on emotion regulation was large and highly significant, emotion regulation's effect on relationship satisfaction was not significant; therefore, the indirect effects of mindfulness on relationship satisfaction through emotion regulation were non-significant as well. Emotion regulation was not a mediator. Given

the wide support for the importance of emotion regulation in relationships and the links between mindfulness and emotion regulation, this finding was surprising.

Insight into this seemingly incongruous result may be found in the recent work of Coffey, Hartman and Fredrickson (2010). These authors point out that there is considerable conceptual overlap between the FFMQ measure of mindfulness and the DERS measure of difficulties in emotion regulation; as written both instruments measure a very similar construct. The very large correlation between mindfulness and emotion regulation found in this study ($r_s = .72$) may be indicative of the overlap in the two measures. Exploratory factor analysis conducted by Coffey et al. showed that mindfulness and emotion regulation, as defined by these two measures, are not two distinct constructs; some of the same processes are simultaneously considered mindfulness and emotion regulation. For instance, items in the DERS subscale non-acceptance of emotional response, (e.g. “when I’m upset I become embarrassed for feeling that way”) appears to be highly related to mindfulness subscale non-judge (e.g. “I think some of my emotions are bad or inappropriate and I shouldn’t feel them”). This is not surprising, considering development of both measures was influenced by Linehan’s theory forming the foundation for her dialectical behavior therapy for borderline personality patients (1993). Coffey et al. found that the overlap is comprised of three distinct facets: acceptance of internal experience, recognition of internal experience and ability to control behavior in the presence of unpleasant internal experience, each containing questions from at least two subscales of both measures. Two aspects of mindfulness as it is currently conceptualized and as measured by the FFMQ do not overlap, with emotion regulation: present-centered attention and mindful awareness. It is

interesting that present-centered attention and awareness are the two aspects that have persisted throughout the debate surrounding the definition of mindfulness (Bishop, et al., 2004; Brown & Ryan, 2003; A. Hayes & Feldman, 2004). Coffey suggests that because mindfulness and emotion regulation, as conceptualized by the FFMQ and DERS subsume multiple sub-processes in common, it may not be appropriate to use them together in the same study. Rather, she suggests that using a combination of subscales from both questionnaires may most accurately reflect the constructs that underlie these terms.

Given the “murkiness” of these two constructs, the findings of this study, when using the two measures together, must be viewed with caution. However, examining the present-centered attention subscale (facet observe) and the mindful awareness subscale (act with awareness) separately from the full mindfulness measure in analyses examining emotion regulation as mediator may have helped clarify the two concepts somewhat.

This examination led to one of the more striking findings of the study - the complete mediation of the effects of mindful awareness on relationship satisfaction by effective emotion regulation. Mindful awareness refers to attending to activities in the moment rather than allowing attention to be focused elsewhere, to be “on autopilot.” In the context of relationships, mindful awareness implies that the individual is able to remain in contact with their partner, rather than ruminating or “checking out” in unpleasant or challenging situations, thus building intimacy through their interactions. Research has shown that the ability to stay in contact, in the moment, even during conflict requires emotion regulation skills. This finding suggests that the true value of mindful awareness to relationships is through contributing to effective emotion regulation. This finding is consistent with previous research suggesting that mindfulness contributes to the ability to

manage challenging emotions. It also suggests the crucial nature of mindfulness skills in developing effective emotion regulation to support relationship satisfaction.

Another not unexpected, but perplexing finding was the non-significant effects of empathic concern as a mediator. As noted, this was a replication of prior findings of this author, and recent publications have reported similar results (Birnie, Speca, et al., 2010; Block-Lerner, et al., 2007; Wachs & Cordova, 2007). As evidence mounts for the lack of relationship between mindfulness and empathic concern, the question remains: why?

One possible explanation for this finding may be found in Hahn's (1998) and Kornfield's (1993) writings. Both note that the connections between mindfulness and relationship quality have to do with mindfulness meditation practice. Buddhist teachings also specifically state that mindfulness and compassion are related through meditation practice. Perhaps, empathic concern is a more "mature" response to the emotions of others that requires more than naturally occurring mindfulness. And, when the moderated mediation model was examined using mindfulness practice as a moderator, there was a significant interaction between mindfulness and empathic concern. For people who practice mindfulness meditation, mindfulness scores were positively correlated with empathic concern scores. For those who did not practice mindfulness meditation, mindfulness scores were negatively correlated with empathic concern scores. Even with the interaction, however, the indirect effects of empathic concern on the association between mindfulness and relationship satisfaction did not reach significance. While not conclusive, this suggestive evidence that mindfulness practice may play a role in the use of empathic concern warrants further exploration.

Additional insight comes from Coffey and colleagues (2010). They examined several potential mediators of the relationship between mindfulness and psychological wellness and flourishing and showed a significant direct effect between mindful attention and distress. In explanation, they posited that directly attending to one's experience may make that experience more salient and may, for some, heighten the unpleasantness. In the context of empathic concern, we may be seeing a similar phenomenon. For some, paying attention to a partner's emotional experience may be distressing, especially for individuals with low levels of emotion regulation skills. The current finding that effective emotion regulation conditionally moderates the association between nonreactivity and relationship satisfaction though empathic concern supports this idea. For individuals who are able to effectively regulate their personal emotions, empathy is an important factor. For those who are not emotionally skillful, attending to the emotions of other may lead to distress and less satisfaction in their relationships. This finding provides a "first step" in understanding the relationship between mindfulness and empathic concern. It will be important to continue these steps in future research.

Results clearly supported the importance of two of the four hypothesized mediators in the relationship between mindfulness and relationship satisfaction. As hypothesized, increased mindfulness was associated with the cognitive component of empathy, perspective taking. Perspective taking, in turn, was associated with relationship satisfaction. Perspective taking partially mediates the effects of mindfulness on relationship satisfaction, showing that it is one of the important processes by which mindfulness influences relationships. As one of the two processes tested that did mediate the IV-DV relationship, it accounted for approximately one quarter of the total effect.

Knowing that perspective taking is important; the next steps for research will be to test hypotheses about how mindfulness affects this process.

The final process that was tested was positivity, measured as the ratio of positive to negative affect. Fredrickson and Losada suggest that this construct captures the affective “flavor” of an individual, rather than capturing separate measures of positive and negative affect. The strongest mediation effects, and the most exciting findings of the study are with positivity. The effect of mindfulness on positivity was strong, an effect size of 0.526 ($p < 0.001$), and there is no reason to believe that the measures used for these two processes overlap. The effect of positivity on relationship satisfaction was not as strong, an effect size of 0.165, however, still significant. The indirect effect was 0.084 and positivity mediated over 35% of the indirect effect. Together, positivity and perspective taking mediate over half of the effects of mindfulness on relationship satisfaction.

These findings are exciting because this may be the first study that has looked at how positive and negative affect, together, provide a mechanism for mindfulness to influence relationship satisfaction. Prior studies have shown that individuals who are more mindful have more positive affect than people who are less mindful, and likewise, people who are less mindful tend to have more negative affect. This is the first study that has shown that people who are more mindful have a higher ratio of positive to negative affect and that high positivity ratio may be an important process in their relationship satisfaction. It will be important to further test this theory with longitudinal studies to determine the direction of causality in this situation.

Finally, this study attempted to take a closer look at the mindfulness facet of nonreactivity. It is noteworthy that while the total effect of mindfulness on relationship satisfaction is 0.246, the total effect of nonreactivity on relationship satisfaction is 0.198, only a slightly smaller effect size. Effects of nonreactivity on three of the four mediator variables were significant, following the same pattern as the full mindfulness measure. And in the case of perspective taking, while the indirect effects were slightly smaller (0.054 versus 0.058) the percent mediation was higher (27.18% versus 23.26%). For positivity, the effect size of the indirect effect of mindfulness and relationship satisfaction was quite a bit larger (0.087 versus 0.069), but the percent mediation was almost the same (35.28% versus 35.16%). These findings identify nonreactivity as an important subscale of mindfulness and they give some insight into how this concept may influence relationship satisfaction.

Although Buddhist teachings have stressed the role of mindfulness in human relationships for centuries, research on the association between mindfulness and the ability to build and sustain satisfying relationships is in early stages. Theoretically, it has been suggested that mindfulness is related to the ability to regulate emotions, the ability to express empathy, and to have higher levels of positivity, and that through these processes, it increases physical and psychological wellness. Research is beginning to demonstrate these paths. Recently, theories have expanded from the role of mindfulness in individual health and well-being to the health and well-being of relationships and the work has begun to test those theories. Early research exploring mindfulness within relationships has been promising; however, study populations have been largely limited to young, college age individuals with limited meditation experience and couples that are

relatively satisfied with their relationships. This study tested these theories in a diverse population of meditators and non meditators as well as with individuals representing a wide range of satisfaction in their relationships.

Future Directions

There are several implications for continued work focusing on relationships in the findings of this study. While there were mixed findings for the role of empathy in general, perspective taking was clearly shown to be a mediator of the relationship between mindfulness and relationship satisfaction. Interventions may be developed using mindfulness as a relationship enhancement method to increase the individual's ability to take another's perspective. Empathic concern was shown to approach significance as a mediator when participants practiced mindful meditation and when levels of emotional awareness were high. Interventions might consider targeting emotion regulation first, before attempting to train empathic concern. Additionally interventions for couples that focus on mindfulness training may be wise to include activities that target increased positive affect within the relationship, much as cognitive behavioral couple therapy currently does. These activities could include mindfully doing pleasant activities as a couple. These potential interventions may be important not only in couples work, but in any situation pertaining to family and professional caregivers, teachers, therapists and other health care workers that rely on satisfying relationships for their success.

Additionally, future directions in research include attempting to further clarify emotion regulation, empathy and positivity as processes that mediate the relationship between mindfulness and the ability to cultivate and sustain satisfying relationships.

Additionally, the relationship between mindfulness and empathic concern should continue to be examined. Perhaps a longitudinal study using techniques that target emotion regulation, such as the DBT skillfulness modules focusing on mindfulness, or MBCT as well as developing a mindfulness practice would lead to improvements in empathic concern.

Limitations of the Study

This study has several limitations. First, the overlap between the FFMQ mindfulness measure and the DERS emotion regulation measure calls into question findings regarding the relationship found between these measures in this study. Future work to re-calculate the measures, separating out the concepts of mindfulness and emotion regulation will be important. Then, analyses can be rerun and compared to results from the current study. Coffey and colleagues (2010) have provided their empirically derived measure of mindfulness, the Carolina Empirically Derived Mindfulness Inventory (C.E.D.M.I), which uses questions included in the current study.

Second, while the current study uncovered promising preliminary data about the importance of positivity, questions did not specifically ask about the experience of particular emotions within the context of the participant's relationship. It will be important in future research that focuses on positivity in relationships to be able to tease out affect that is brought into the relationship versus that which is generated within the relationship.

Third, while the diversity of the population used for this study is much broader than those used before, there is still a problem of generalizability of the results of this study, in

that this population is one that would respond to an internet advertisement. Also, the study looked at individuals self reporting on the romantic relationship in their life, giving a rather one-sided view of interpersonal phenomena. Examining couples, reporting both separately and together may much more informative and representative of the true nature of relationships.

In addition, the study was cross-sectional, and did not look at changes in mindfulness over time. A longitudinal design could have compared “trait” and “state” (Brown & Ryan, 2003) mindfulness to determine if the relationship between mindfulness and satisfying relationships varies with time.

A final limitation concerns the use self report measures to examine aspects of mindfulness. Asking participants who may not be particularly mindful to notice and report on the frequency of their present-moment experience presents a confound in itself. It will be important in future research to modify laboratory based experiments to be used with couples.

Conclusions

In conclusion, this study contributes to the understanding of the relationship between mindfulness and relationship satisfaction. Cognitive aspect of empathy, perspective taking and positivity were clearly shown to be positively related to mindfulness and to mediate the association between mindfulness and relationship satisfaction. The relationships between emotion regulation and empathic concern and mindfulness were not as clear, however, there is some evidence of associations. Given that higher levels of emotion regulation, empathy and positivity are thought to be related to successful

interpersonal functioning these findings can be considered a first step in determining how mindfulness contributes to these important processes.

APPENDICES

APPENDIX A

Measures

Demographic Information

Please circle the number that answers the question best for you.

1. I am a: (a) Male (b) Female

2. My ethnic heritage is:

(a) Hispanic

(b) White

(c) African American

(d) Asian or Pacific Islander

(e) Native American

(e) Other _____

3. My age is:

(a) under 18 (b) 18 – 21 (c) 22 – 30 (d) 31 – 40 (e) 41 – 50 (f) 51 – 60

(g) 61 – 70 (h) 71 or over

4. I have been in the relationship I am describing in this study for _____ years.

(a) less than 1 (b) 1 - 5 (c) 6 - 10 (d) 11 - 15 (e) 16 - 20

(f) 21 – 30 (g) 31 – 40 (h) 41 – 50 (g) over 50

5. I practice meditation (a) yes (b) no

If you practice meditation please answer the following questions.

6. What type of meditation do you practice?

(a) Transcendental meditation (b) Centering Prayer

(c) Mindfulness meditation (d) Yoga

(e) Relaxation Meditation

(f) Another form of meditation

7. How long have you been practicing meditation?

(a) less than 1 year (b) 1 – 5 years (c) 6 – 10 years (d) 11 – 15 years

(e) 16 – 20 years (f) over 20 years

8. Do you consider yourself

(a) a novice meditator (b) an experienced meditator (c) an expert meditator

9. How often do you meditate?

(a) more than once daily (b) once daily (c) several times a week

(d) once a week (e) More than once a month but less than once a week

(f) less than once a month.

9. Do you believe that mindfulness has any effect on the relationship you are describing for this study? (a) yes (b) no

10. If you answered question 9. Yes, please describe those effects

_____.

Mindfulness: Five Factor Mindfulness Questionnaire.

Reference: Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006).

Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27-45.

1 = never or very rarely true 2 = infrequently true 3 = true about half of the time

4 = frequently true 5 = very often or always true

Instructions: Please answer according to what really reflects your experience rather than what you think your experience should be. Circle on number for each statement.

1. I perceive my feelings and emotions without having
to react to them. 1 2 3 4 5
2. I watch my feelings without getting lost in them. 1 2 3 4 5
3. In difficult situations I can pause without immediately reacting. 1 2 3 4 5
4. When I have distressing thoughts or images, I am able to just
notice them without reacting. 1 2 3 4 5
5. When I have distressing thoughts or images, I feel calm soon
after. 1 2 3 4 5
6. When I have distressing thoughts or images, I “step back”
and am aware of the thought or image without getting
taken over by it. 1 2 3 4 5
7. When I have distressing thoughts or images, I just notice them
and let them go by. 1 2 3 4 5
8. When I’m walking, I deliberately notice the sensations of my
body moving. 1 2 3 4 5
9. When I take a shower or a bath, I stay alert to the sensations
of water on my body. 1 2 3 4 5
10. I notice how foods and drinks affect my thoughts, bodily
sensations, and emotions. 1 2 3 4 5
11. I pay attention to sensations, such as the wind in my
hair or sun on my face. 1 2 3 4 5

12. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing. 1 2 3 4 5
13. I notice the smells and aromas of things. 1 2 3 4 5
14. I notice the visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow. 1 2 3 4 5
15. I pay attention to how my emotions affect my thoughts and behavior. 1 2 3 4 5
16. I find it difficult to stay focused on what's happening in the present. (r) 1 2 3 4 5
17. It seems I'm "running on automatic" without much awareness of what I'm doing. (r) 1 2 3 4 5
18. I rush through activities without being really attentive to them.(r) 1 2 3 4 5
19. I do jobs or tasks automatically, without being aware of what I'm doing. (r) 1 2 3 4 5
20. I find myself doing things without paying attention. (r) 1 2 3 4 5
21. When I do things my mind wanders off and I'm easily distracted. (r) 1 2 3 4 5
22. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. (r) 1 2 3 4 5
23. I am easily distracted. (r) 1 2 3 4 5
24. I'm good at finding the words to describe my feelings. 1 2 3 4 5
25. I can easily put my beliefs, opinions, and expectations into words. 1 2 3 4 5

26. It's hard for me to find the words to describe what I'm thinking. (r) 1 2 3 4 5
27. I have trouble thinking of the right words to express how
I feel about things. (r) 1 2 3 4 5
28. When I have a sensation in my body, it's hard for me to describe
it because I can't find the right words.(r) 1 2 3 4 5
29. Even when I'm feeling terribly upset, I can find a way to
put it into words. 1 2 3 4 5
30. My natural tendency is to put my experiences into words. 1 2 3 4 5
31. I can usually describe how I feel at the moment in
considerable detail. 1 2 3 4 5
32. I criticize myself for having irrational or inappropriate
emotions. (r) 1 2 3 4 5
33. I tell myself that I shouldn't be feeling the way I'm feeling. (r) 1 2 3 4 5
34. I believe some of my thoughts are abnormal or bad and
I shouldn't think that way. (r) 1 2 3 4 5
35. I make judgments about whether my thoughts are good or bad. (r) 1 2 3 4 5
36. I tell myself I shouldn't be thinking the way I'm thinking. (r) 1 2 3 4 5
37. I think some of my emotions are bad or inappropriate
and I shouldn't feel them. (r) 1 2 3 4 5
38. I disapprove of myself when I have irrational ideas. (r) 1 2 3 4 5
39. When I have distressing thoughts or images, I judge myself
good or bad, depending what the thought/image is about. (r) 1 2 3 4 5

Note: r = reverse coded.

Relationship Satisfaction: Abbreviated Dyadic Adjustment Scale, later renamed Dyadic Adjustment Scale – 7.

Reference: Sharpley, C. F., & Rogers, H. J. (1984). Preliminary validation of the Abbreviated Spanier Dyadic Adjustment Scale: Some psychometric data regarding a screening test of marital adjustment. *Educational and Psychological Measurement, 44*(4), 1045-1049.

Instructions: Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each of the following items.

1. Philosophy of life?

5	4	3	2	1	0
Always	Almost	Occas-	Frequently	Almost	Always
Agree	Always	sionally	Disagree	Always	Disagree
	Agree	Agree		Disagree	

2. Aims, goals, and things believed important

5	4	3	2	1	0
Always	Almost	Occas-	Frequently	Almost	Always
Agree	Always	sionally	Disagree	Always	Disagree
	Agree	Agree		Disagree	

3. Amount of time spent together

5	4	3	2	1	0
Always	Almost	Occas-	Frequently	Almost	Always
	Always	sionally	Disagree	Always	Disagree
	Agree	Agree		Disagree	

How often would you say the following events occur between you and your mate?

4. Have a stimulating exchange of ideas

0	1	2	3	4	5
Never	Less than	Once or	Once or	Once a	More
	once a	twice a	twice a	day	often
	month	month	week		

5. Calmly discuss something

0	1	2	3	4	5
Never	Less than	Once or	Once or	Once a	More
	once a	twice a	twice a	day	often
	month	month	week		

6. Work together on a project

0	1	2	3	4	5
Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often

7. The dots on the following line represent different degrees of happiness in your relationship. The middle point, "happy," represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your relationship.

0	1	2	3	4	5	6
-----•-----•-----•-----•-----•-----•-----•-----						
Extremely Unhappy	Fairly Unhappy	A Little Unhappy	Happy	Very Happy	Extremely Happy	Perfect

Empathy: Interpersonal Reactivity Index, Perspective Taking and Empathic Concern

Subscales

Reference: Davis, M.H. (1994). *Empathy: A social psychological approach*. Madison, WI: Brown & Benchmark.

Empathic Concern Subscale. Instructions: Please read each statement and decide how much you agree with it. Circle one number for each statement using the following scale:

0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree

1. I often have tender, concerned feelings for people less fortunate than me. 0 1 2 3 4
2. Sometimes I don't feel very sorry for other people when they are having problems (r). 0 1 2 3 4
3. When I see someone being taken advantage of, I feel kind of protective towards them. 0 1 2 3 4
4. Other people's misfortunes do not usually disturb me a great deal (r). 0 1 2 3 4
5. When I see someone being treated unfairly, I sometimes don't feel very much pity for them (r). 0 1 2 3 4
6. I am often quite touched by things that I see happen. 0 1 2 3 4
7. I would describe myself as a pretty soft-hearted person. 0 1 2 3 4

Note: r = reverse coded.

Perspective Taking subscale. Instructions: Please read each statement and decide how much you agree with it. Circle one number for each statement using the following scale:

0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree

1. I sometimes find it difficult to see things from the "other person's" point of view (r). 0 1 2 3 4
2. I try to look at everybody's side of a disagreement before I make a decision. 0 1 2 3 4
3. I sometimes try to understand my friends better by

- imagining how things look from their perspective. 0 1 2 3 4
4. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments (r). 0 1 2 3 4
5. I believe that there are two sides to every question and try to look at them both. 0 1 2 3 4
6. When I'm upset at someone, I usually try to "put myself in his/her shoes" for a while. 0 1 2 3 4
7. Before criticizing somebody, I try to imagine how I would feel if I were in their place. 0 1 2 3 4

Note: r = reverse coded.

Effective Emotion Regulation: Difficulties in Emotion Regulation Scale

Reference: Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, 26(1), 41-54.

Instructions: Please read each statement and indicate how often the items apply to you.

Circle one number for each statement using the following scale:

1 = almost never (0 - 10%) 2 = sometimes (11 - 35%) 3 = about half of the time (36 - 65%) 4 = most of the time (66 - 90%) 5 = almost always (91-100%)

1. I am clear about my feelings. (r) 1 2 3 4 5
2. I pay attention to how I feel. (r) 1 2 3 4 5
3. I experience my emotions as overwhelming and out of control. 1 2 3 4 5

- | | | | | | |
|---|---|---|---|---|---|
| 4. I have no idea how I am feeling. | 1 | 2 | 3 | 4 | 5 |
| 5. I have difficulty making sense out of my feelings. | 1 | 2 | 3 | 4 | 5 |
| 6. I am attentive to my feelings. (r) | 1 | 2 | 3 | 4 | 5 |
| 7. I know exactly what I am feeling. (r) | 1 | 2 | 3 | 4 | 5 |
| 8. I care about what I am feeling. (r) | 1 | 2 | 3 | 4 | 5 |
| 9. I am confused about what I am feeling. | 1 | 2 | 3 | 4 | 5 |
| 10. When I'm upset, I acknowledge my emotions. (r) | 1 | 2 | 3 | 4 | 5 |
| 11. When I'm upset, I become angry with myself for feeling that way. | 1 | 2 | 3 | 4 | 5 |
| 12. When I'm upset, I become embarrassed with myself for feeling
that way. | 1 | 2 | 3 | 4 | 5 |
| 13. When I'm upset, I have difficulty getting work done. | 1 | 2 | 3 | 4 | 5 |
| 14. When I'm upset, I become out of control. | 1 | 2 | 3 | 4 | 5 |
| 15. When I'm upset, I believe that I will remain that way
for a long time. | 1 | 2 | 3 | 4 | 5 |
| 16. When I'm upset, I believe that I'll end up feeling very depressed. | 1 | 2 | 3 | 4 | 5 |
| 17. When I'm upset, I believe that my feelings are valid and
important. | 1 | 2 | 3 | 4 | 5 |
| 18. When I'm upset, I have difficulty focusing on other things. | 1 | 2 | 3 | 4 | 5 |
| 19. When I'm upset I feel out of control. | 1 | 2 | 3 | 4 | 5 |
| 20. When I'm upset, I can still get things done. (r) | 1 | 2 | 3 | 4 | 5 |
| 21. When I'm upset, I feel ashamed with myself for
feeling that way. | 1 | 2 | 3 | 4 | 5 |
| 22. When I'm upset, I know that I can find a way to | | | | | |

- | | | | | | |
|---|---|---|---|---|---|
| eventually feel better. (r) | 1 | 2 | 3 | 4 | 5 |
| 23. When I'm upset, I feel like I am weak. | 1 | 2 | 3 | 4 | 5 |
| 24. When I'm upset, I feel like I can remain in control
of my behaviors. (r) | 1 | 2 | 3 | 4 | 5 |
| 25. When I'm upset, I feel guilty for feeling that way. | 1 | 2 | 3 | 4 | 5 |
| 26. When I'm upset, I have difficulty concentrating. | 1 | 2 | 3 | 4 | 5 |
| 27. When I'm upset, I have difficulty controlling my behavior. | 1 | 2 | 3 | 4 | 5 |
| 28. When I'm upset, I believe that there is nothing I can do
to make myself feel better. | 1 | 2 | 3 | 4 | 5 |
| 29. When I'm upset, I become irritated with myself for feeling
that way. | 1 | 2 | 3 | 4 | 5 |
| 30. When I'm upset, I start to feel very bad about myself. | 1 | 2 | 3 | 4 | 5 |
| 31. When I'm upset, I believe that wallowing in it is all I can do. | 1 | 2 | 3 | 4 | 5 |
| 32. When I'm upset, I lose control over my behaviors. | 1 | 2 | 3 | 4 | 5 |
| 33. When I'm upset, I have difficulty thinking about anything else. | 1 | 2 | 3 | 4 | 5 |
| 34. When I'm upset, I take time to figure out what
I'm really feeling. (r) | 1 | 2 | 3 | 4 | 5 |
| 35. When I'm upset, it takes me a long time to feel better. | 1 | 2 | 3 | 4 | 5 |
| 36. When I'm upset, my emotions feel overwhelming. | 1 | 2 | 3 | 4 | 5 |

Note: r = reverse coded.

Affect: Positive and Negative Affect Schedule

Reference: Watson, D., Clark, L.A. & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.

Instructions: The words below describe different feeling and emotions you may have. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you generally feel this way, that is, how you feel this way on average.

1 = very slightly or not at all

2 = a little

3 = moderately

4 = quite a bit

5 = extremely

_____ interested

_____ irritable

_____ distressed

_____ alert

_____ excited

_____ ashamed

_____ upset

_____ inspired

_____ strong

_____ nervous

_____ guilty

_____ determined

_____ scared

_____ attentive

_____ hostile

_____ jittery

_____ enthusiastic

_____ active

_____ proud

_____ afraid

_____ contempt

_____ disrespect

Social Desirability: Marlowe Crowne Social Desirability Scale

Reference: Reynolds, W.M. (1982). Development of reliable and valid short forms of the Marlowe- Crowne Social Desirability Scale. *J. of Clinical Psychology*, 38(1), 119-125.

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

1. It is sometimes hard for me to go on with my work if I am not encouraged. T F
2. I sometimes feel resentful when I don't get my way. T F
3. On a few occasions, I have given up doing something because I thought too little of my ability. T F
4. There have been times when I felt like rebelling against people in authority even though I knew they were right. T F
5. No matter who I'm talking to, I'm always a good listener. T F
6. There have been occasions when I took advantage of someone. T F
7. I'm always willing to admit it when I make a mistake. T F
8. I sometimes try to get even rather than forgive and forget. T F
9. I am always courteous, even to people who are disagreeable. T F
10. I have never been irked when people expressed ideas very different from my own. T F
11. There have been times when I was quite jealous of the good fortune of others. T F
12. I am sometimes irritated by people who ask favors of me. T F
13. I have never deliberately said something that hurt someone's feelings. T F

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