

EFFECTS OF MINDFULNESS TRAINING ON INDIVIDUALS EXPERIENCING POST-
BREAKUP DISTRESS: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

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Relationship breakups are a common part of most young adults' experience and frequently cause considerable emotional and psychological distress. The current study used a randomized, longitudinal approach to assess the effectiveness of mindfulness training, as compared to relaxation training and no-treatment control, for individuals dealing with the recent breakup of a romantic relationship. The purpose of the study was to examine the association between mindfulness, spirituality, attachment, and psychological symptoms. Potential moderating and mediating effects of spirituality and/or attachment were of particular interest.

Eighty seven participants took part in the full eight-week study. They completed assessment measures at pre, post, and follow-up time points. A series of mixed design repeated measures ANCOVAs, with religiousness entered as a covariate, assessed main and interaction effects of mindfulness training, spirituality, and attachment on outcomes. While mindfulness was not significantly more effective than relaxation and no-treatment, and hypotheses related to moderation were not supported, attachment style was found to be a predictor of several outcomes, including positive emotion and forgiveness. In addition, mediation analyses showed that spirituality mediated the relationship between baseline mindfulness and anger rumination, positive emotions, post-traumatic growth, and forgiveness, suggesting that the effects of mindfulness on psychological distress occur in part through changes in spirituality. Future exploration of the role of spirituality in mindfulness interventions seems warranted, particularly for individuals with lower baseline spirituality and/or higher baseline distress who appear most

likely to benefit. In addition, future research on attachment might focus on the differential response to treatment of individuals with insecure attachment styles.

A jug fills drop by drop.

Siddhartha Gautama

To Joel – my partner in living, loving, learning, parenting,
personal growth, self-discovery, and so much more.

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INTRODUCTION

Dissolution of Non-Marital Romantic Relationships

Non-marital romantic breakups are a common and painful aspect of young adulthood. A majority of college undergraduates - 83 percent in a study by Battaglia, Richard, Datteri, and Lord (1998), reported having experienced one or more breakups in their lifetime. Similarly, in a longitudinal study of unmarried 18 to 35 year olds, Rhoades, Kamp Dush, Atkins, Stanley, and Markman (2011) found that more than one-third of participants experienced at least one intimate relationship breakup within a 20 month timeframe. Clearly, most individuals are likely to experience the breakup of a romantic relationship at least once, and likely more often, during their lifetime.

Relationship breakups are often considered to be quite stressful. For instance, in a study by Crandall, Preisler, and Aussprung (1992) college students rated going through a breakup as one of the most stressful life events they could experience. Indeed, for many individuals, the dissolution of dating relationships can cause considerable emotional and psychological distress (Rhoades, et al., 2011), including negative symptoms such as anger (Sbarra & Emery, 2005), depression (Mearns, 1991; Monroe, Rohde, Seeley, & Lewinsohn, 1999), and rumination (Saffrey & Ehrenberg, 2007). Breakups can also lead to profound personal changes, such as being forced to re-define one's self-concept and understanding who one is as an individual (Slotter, Gardner, & Finkel, 2010), leading to further distress.

Some researchers have even described the suffering associated with breakups as a form of complicated grief (Field, Diego, Pelaez, Deeds, & Delgado, 2009), characterized by intense emotions, feelings of emptiness, intrusive thoughts, loss of interest in daily activities, insomnia, and other disturbances of normal functioning. When a breakup involves betrayal, the resulting

constellation of symptoms, including trauma, anger, and emotional pain, has been compared to Post-Traumatic Stress Disorder (Fisher, 2004). Other researchers have compared the difficulties resulting from rejection to the symptoms of withdrawal from highly addictive drugs such as cocaine or opioids (Bartels & Zeki, 2000). Indeed, breakup distress is especially difficult for those who do not initiate a breakup but are rejected by their partner (MacDonald & Leary, 2005). For many reasons, then, the dissolution of a relationship can be a difficult experience.

Although individuals can respond in many different ways to a breakup, maladaptive forms of coping are not uncommon. Certainly, some individuals exhibit resilience, are able to harness useful resources, such as social support, and experience growth and thriving after a breakup (Hebert & Popadiuk, 2008). However, many other individuals exhibit less functional behavior. They often experience extreme emotions and respond through a range of negative behaviors including substance use, avoidance, denial, repression, aggression, retaliation, and, in extreme case, suicidal or homicidal ideation (Mearns, 1991; Perilloux & Buss, 2008).

Due to the high frequency and many negative consequences of breakups among young adults, researchers have suggested that it is important to find successful treatments for dealing with breakup distress (Field, et al., 2009; Saffrey & Ehrenberg, 2007), including, for example, mindfulness-based therapies. To date, however, no studies have looked at the potential use of mindfulness as a strategy for helping young adults deal with the stresses of relationship dissolution; this despite the use in recent years of mindfulness as an intervention for coping with a range of difficult problems, experiences, and illnesses. The current study represents a first attempt to assess the effectiveness of mindfulness meditation training for young people dealing with the distress resulting from the ending of a dating relationship.

About Mindfulness Meditation

Mindfulness meditation can take a range of forms and refers to a variety of practices and techniques, all attempting to develop the quality of mindfulness. While mindfulness and meditation are not synonymous, they share numerous attributes, for instance, paying attention to one's experience (e.g., respiration, thoughts, physical sensations) and maintaining an observing versus judging attitude. There is no agreement among researchers and theorists as to exactly what mindfulness and mindfulness meditation refer to and various studies conceptualize it differently (see Bishop et al., 2004 and Brown, Ryan, & Creswell, 2007 for more detailed discussions). For instance, definitions can be nuanced, pay selective attention to one or more aspects of the technique, and be influenced by clinical theories and aims (Brown et al., 2007). Nonetheless, in the psychological literature mindfulness generally refers to practices derived from Buddhist philosophy/spirituality, which cultivate attributes also developed by meditation practices, such as attention, intention, and attitude (Nyklíček, Vingerhoets, & Zeelenberg, 2011; Shapiro, Carlson, Astin, & Freedman, 2006).

One of the most common definitions of mindfulness is that of Jon Kabat-Zinn, the developer of MBSR, who describes mindfulness as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 4). Mindfulness is often thought of as a state of consciousness (Brown & Ryan, 2003) which can be cultivated by most individuals through practice. Despite differences in the nuances of various conceptualizations, the general aim of mindfulness practices and techniques might be described as directing attention deliberately and clearly to one's present experience, as it is, without distortion by personal fantasies, fears, desires, or judgments. Such deliberate attention to one's thoughts, emotions, and experiences could potentially be beneficial to individuals going through

a breakup, in that it could serve as a more effective alternative to unproductive coping strategies (e.g. denial, repression, or altered states of consciousness produced by taking alcohol or drugs) which are often used to deal with the pain of a relationship loss (Perilloux & Buss, 2008).

Certainly, within the literature there is more consensus around the idea that mindfulness can cultivate various aspects of well-being in its practitioners. Although no studies have assessed mindfulness with individuals experiencing the loss of an intimate relationship, mindfulness practice may also be useful to them. The following sections describe some of the benefits which have been attributed to mindfulness practice which could be relevant to individuals who have recently experienced a breakup.

Mindfulness in the psychological literature. Mindfulness has received increased attention within psychology, as well as the health sciences, in recent years. For instance, a Web of Science search shows a dramatic increase over the past several decades in the number of published articles pertaining to mindfulness. Prior to 1989, a total of 16 articles appeared; however, since then growth has been exponential. Between 1990 and 1999, 90 articles appeared; between 2000-2009, 1059; and in the first three years of the most recent decade, 1324.

Much of the literature assessing the effects of mindfulness describes studies which are correlational, have small sample sizes, do not utilize control groups or random assignment, rely primarily on self-report, and/or lack follow-up. As a result, many of the significant findings derived from this literature should be considered tentative and may be explained by other mechanisms, such as expectancy bias or maturational effects. Nonetheless, the accumulating evidence suggests that mindfulness may have a range of positive effects, both physical and psychological. As such, mindfulness is a potentially important resource for improving physical

and mental outcomes for a range of individuals struggling with a variety of difficulties, including the stresses resulting from the dissolution of a romantic relationship.

Mental health benefits of mindfulness. Since Jon Kabat-Zinn's early studies with chronic pain patients using a stress reduction program that incorporated mindfulness meditation (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, & Burney, 1985), mindfulness has been a growing part of clinical research not only in medicine, but also in the field of psychology. Kabat-Zinn's Mindfulness Based Stress Reduction (MBSR), as well as other mindfulness-based approaches including Dialectical Behavior Therapy (DBT; Linehan, 1993), Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2012), and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), have been linked with a number of mental health benefits. For example, mindfulness related treatments and practices have been associated with positive outcomes for patients struggling with psychological symptoms including anger (Singh et al., 2010; Speca, Carlson, Goodey, & Angen, 2000), anxiety/depression (Hofmann, Sawyer, Witt & Oh, 2010), and substance abuse (Witkiewitz & Bowen, 2010). These difficulties are commonly experienced by individuals experiencing a breakup and thus relevant to the current discussion. For recent reviews of research regarding the comprehensive mental health benefits of mindfulness, see Chiesa & Serretti, 2011, Fjorback, Arendt, Arnbøl, Fink & Walach, 2011, and Keng, Smoski & Robins, 2011.

Interpersonal benefits of mindfulness. In addition to mental health benefits, mindfulness practices have been shown to enhance the quality of relationships – including romantic (Burpee & Langer, 2005; Carson, Carson, Gil, and Baucom, 2004; Wachs & Cordova, 2007), parental (Coatsworth, Duncan, Greenberg, & Nix, 2010; Singh et al., 2007; van der Oord, Bögels, & Peijnenburg, 2012), and therapeutic relationships (Bruce, Manber, Shapiro, &

Constantino, 2010; Christopher et al., 2011; Rimes & Wingrove, 2011). In fact, in one meta-analysis of the effects of meditation, Sedlmeier et al. (2012) looked at 21 different dependent variable categories. The largest effects occurred for relationship/interpersonal variables, with a medium to large effect size ($r = .44$). The effects of mindfulness/ meditation practice found in the research to date include reduced negativity, conflict, and verbal aggression, and improved overall relationship quality and satisfaction.

Although these relationship quality improvements are not completely germane for individuals who have recently *ended* a romantic relationship, mindfulness also appears to have peripheral effects which may be relevant. For instance, several research studies suggest that mindfulness can yield positive effects interpersonally by enhancing personal qualities such as empathy (see Block-Lerner, Adair, Plumb, Rhatigan, and Orsillo, 2007), emotional intelligence, (Schutte, et al., 2001), anger management (Singh et al, 2010), and forgiveness (Oman, Shapiro, Thoresen, Plante, & Flinders, 2008). In addition, Saavedra, Chapman, and Rogge (2010) found that higher levels of mindfulness can help reduce the negative impact (reactivity, instability, breakup) of attachment anxiety on relationships. These interpersonal benefits may be useful for individuals adjusting to a romantic breakup and help improve the stability of and reduce the level of conflict in future relationships. This suggests that individuals who have recently experienced a romantic breakup may benefit a mindfulness-based intervention.

Mechanisms of mindfulness. As with definitions, the mechanisms of mindfulness are not easily agreed upon. Mindfulness techniques have been hypothesized to impact health and well-being through a number of mechanisms. In general, these mechanisms are thought to help individuals gain increased awareness of present moment reality, contributing to the cultivation of more flexible, adaptive responding and less habitual, impulsive reactions (Brown et al., 2007).

Proposed mechanisms of mindfulness which may be relevant for the current study include dealing with unresolved grief issues (Linehan, 1993), improving one's ability to regulate emotions (Arch & Craske, 2006), and developing an attitude of acceptance and non-judgment (Brown et al., 2007; Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

Grieving is especially relevant to individuals dealing with the end of an intimate relationship. After a breakup, one must cope with the loss of hopes, expectations, and dreams for the relationship and for one's desired future with a particular partner. Complicated breakups may also entail the grieving of painful aspects of the relationship itself or of the subsequent breakup, such as infidelity or high levels of conflict. Although research on mindfulness and the grief process is limited, Linehan (1993) suggests that dealing with unresolved or inhibited grief is a key aspect related to borderline personality disorder (BPD). Her approach to treating BPD, Dialectical Behavior Therapy (DBT), relies strongly on mindfulness techniques and has been shown to be effective in helping individuals diagnosed with BPD (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Linehan, et al., 2006). In addition, one recent study of mindfulness looked at the grief process among chronic pain patients (Sagula & Rice, 2004). As compared to a control group, participants in an 8-week mindfulness intervention more effectively moved through the grieving process associated with chronic pain (e.g. losses such as physical activities, relationships, careers, and hobbies). This finding appeared to be most salient in the early stages of the grieving process as conceptualized by Schneider (1994), when individuals gain awareness of their loss(es) and develop coping strategies. These results suggest that a mindfulness intervention might also be helpful for individuals struggling with the grief and loss associated with a relationship breakup.

Similarly, several studies support the relevance of emotion regulation to the effectiveness of mindfulness. For instance, in a study of healthy undergraduates, Hill and Updegraff (2011) showed that emotion regulation mediated the relationship between mindfulness and emotion differentiation and emotion lability. This suggests that improved emotion regulation may contribute to the decreases in the intensity of depressed, anxious, and other negative mood states often seen after mindfulness training. In addition, there is some evidence that problematic emotion regulation is prevalent among individuals diagnosed with BPD and that improving these skills through DBT contribute to the treatment's effectiveness (Linehan, 1993; Salsman & Linehan, 2012).

Acceptance or nonjudgment of one's thoughts, emotions, and experiences – sometimes considered a form of emotion regulation in itself – is a key component of Acceptance and Commitment Therapy (ACT), which derives from and utilizes mindfulness strategies. Numerous studies of the efficacy of ACT support the assertion that the accepting or nonjudging aspect of mindfulness is a key mechanism by which the treatment exerts its effects. Recently, for instance, Forman and colleagues (2012) found that psychological acceptance facilitates decreased symptom severity and progress toward treatment goals by mediating the relationship between ACT and outcomes. In addition, Jimenez, Niles and Park (2010) found that acceptance of self mediated the relationship between mindfulness and depressive symptoms and positive emotions among college students. The authors assert that self-acceptance acts as a regulator of behavior and affect. Overall, then, emotional, experiential, and self-acceptance have all been shown to contribute to the effectiveness of mindfulness and mindfulness-based therapies.

In addition to these more accepted theories, the current study will look at two other potential, though less frequently discussed, aspects which may directly or indirectly affect the

effectiveness of mindfulness interventions: spirituality and attachment style. Neither has been explored to any considerable extent in the context of mindfulness and relationship dissolution, thus there is inconsistent and sometimes contradictory theoretical support as to their specific effects. Nonetheless, there is some research on which to base an assertion that spirituality and attachment may influence the effects of mindfulness on psychological well-being among those struggling with post-breakup distress. This evidence is explored in the following two sections.

Spirituality and Mindfulness

Despite roots in Buddhist traditions, the explicitly spiritual aspects of mindfulness practice are generally removed in order to make it more palatable in a Western, secular context. For instance, MBSR and MBCT have been developed as medical/psychological treatments which remove any references to Buddhist spiritual ideas (Kabat-Zinn, 2011). Nonetheless, it is possible that there are implicitly spiritual components which remain and which lead to the cultivation of spiritual qualities through mindfulness practice. These qualities might include transcendence, boundlessness, ultimacy, and interconnectedness (Falb & Pargament, 2012; Pargament & Mahoney, 2005). Certainly, mindfulness practice is often described as cultivating spiritual characteristics such as peace, equanimity, and a sense of interconnectedness rather than simply positive emotions such as happiness (Brown & Ryan, 2003). A large body of literature supports the notion that positive spiritual resources and methods of coping – of which mindfulness might be considered one – are directly related to positive outcomes (see Pargament, Falb, Ano, & Wachholtz, 2013 for a review). In particular, several studies have shown higher levels of positive spiritual coping and use of spiritual resources after the breakup/divorce of a significant relationship to be related to positive outcomes such as personal and spiritual growth (Hawley & Mahoney, 2013; Krumrei, Mahoney, & Pargament, 2011).

With regard to mechanisms of action, Kristeller (2010) has hypothesized that mindfulness generates a developmental process whereby one realizes the connection between the various aspects of experience (physical, emotional, social, behavioral, cognitive, and spiritual). This results in a pattern of interrelated changes in physical, psychological, and spiritual factors. Thus, spirituality may be one mechanism of the change which results from mindfulness-based practices and therapies.

A number of recent research studies show a relationship between spirituality and mindfulness, although the directionality of this relationship remains unclear. When measured, spirituality and mindfulness often increase together and are generally correlated with improvements in psychological well-being. This relationship has been found among several populations, including healthy subjects (Chiesa & Serretti, 2009), general medical clients (Carmody, Reed, Kristeller, & Merriam, 2008), cancer patients (Garland, Carlson, Cook, Lansdell, & Specca, 2007), and homeless youth (Grabbe, Nguy, & Higgins, 2012).

For instance, in one study of chronically ill patients, Kohls, Walach, and Lewith (2009) found that individuals with a regular spiritual practice were more mindful and that more mindful individuals experienced less distress, especially in the context of negative spiritual experiences. This was particularly true when looking at the interaction between mindfulness and negative spiritual experiences, where mindfulness appeared to buffer against distress resulting from experiences such as spiritual isolation/loneliness or ego loss/ deconstruction. The authors suggest that spiritual techniques may increase resilience, as a consequence of enhanced mindfulness, against negative spiritual experiences. In another study, assessing 44 participants in an MBSR intervention Carmody et al. (2008) found changes in state and trait mindfulness to be associated with changes in spiritual well-being, as well as with a reduction in medical symptoms. The

authors suggest that spiritual well-being, especially aspects such as inner meaning and peace, could be related to the cultivation of increased mindfulness. In a final study exploring the relationships between mindfulness, spirituality, and psychological functioning, Greeson et al. (2011) found that increased daily spiritual experiences after an MBSR program might partially explain better mental health as a result of increased mindfulness. However, confirmatory meditational analyses did not support the assertion that increases in spirituality mediated mindfulness-related quality of life improvements. Instead, an exploratory analysis suggested that changes in mindfulness and spirituality might be bidirectional. The authors speculate that increased mindfulness may allow individuals to more readily notice everyday spiritual experiences – qualities similar to those mentioned previously in this section – including connection and awe.

On the basis of these findings, researchers (e.g. Chiesa and Serretti, 2009) suggest that further research on the relationship between spirituality and outcomes affected by mindfulness practices is warranted. Thus, spirituality will be included as a variable of interest in the current study. Because the relationships between mindfulness, spirituality, and well-being are complex (Greeson et al., 2011) and potentially bi-directional, it will be most useful to approach this issue in an exploratory manner. Nonetheless, several tentative hypotheses will be suggested.

Attachment and Mindfulness

Within psychology, attachment describes the bond that develops between young children and their primary caregiver(s) (Bowlby, 1982). The primary attachment relationship serves as a working model for future relationships and is mirrored in the individual's later, adult relationships (Siegel & Hartzell, 2003). Generally, attachment is broken into two main types: secure and insecure, although sub-divisions of insecure attachment (avoidant, anxious/

ambivalent, disorganized) are sometimes specified. In general, adult attachment is measured across two dimensions – anxiety and avoidance – with lower levels of each indicating more secure attachment (Brennan, Clark, & Shaver, 1998). Insecure attachment has been shown to be associated with higher levels of psychological distress (Shaver, Lavy, Saron, & Mikulincer, 2007) and personality dysfunction (Tiliopoulos & Goodall, 2009), as well as with lower relationship quality, satisfaction, and stability (Davila, Karney, & Bradbury, 1999). Although attachment style is usually fixed, experts suggest that it can change over time (Mikulincer & Shaver, 2007). This may occur, for instance, through later supportive relationships and increased self-awareness of the kind potentially cultivated through mindfulness practice (Siegel & Hartzell, 2003).

As with spirituality, there are indications that attachment style is related to the effects of mindfulness practice, and may influence or be influenced by it. For instance Cordon and Finney (2008) found that securely attached individuals report higher levels of state mindfulness than insecurely attached individuals. In addition, Walsh, Balint, Smolira, Fredericksen, and Madsen (2009) found low attachment anxiety specifically to be related to higher mindfulness. Similarly, Shaver et al. (2007) found both lower anxiously – and avoidantly – attached individuals to be more mindful. The latter study showed that the two attachment dimensions (anxious, avoidant) accounted for 42 percent of the variance in mindfulness scores overall. In the one available intervention study, Cordon, Brown, and Gibson (2009) assessed differential effects of MBSR on securely and insecurely attached individuals. They found that all participants showed significant improvements in perceived stress after the program, although individuals with insecure attachments reported higher levels of pre-intervention stress and greater post-intervention reductions than individuals with secure attachments. The authors tentatively conclude that

insecurely attached individuals may benefit more from mindfulness-based interventions than those who are securely attached. Finally in a study most relevant to the current research, Saavedra, et al. (2010) found higher levels of mindfulness to buffer the negative impact (including increased risk of breakup) of insecure attachment on relationships. This suggests that mindfulness may not only be effective in alleviating breakup distress, but also have longer-lasting implications for future relationship quality, especially for individuals with insecure attachment styles.

Given a lack of intervention studies, researchers suggest further investigation into the relationships between attachment style and mindfulness outcomes. Although preliminary evidence from Cordon and colleagues (2009) suggest that mindfulness may have a greater impact on insecurely attached individuals, it remains uncertain how mindfulness interventions differentially impacts participants based on attachment style. Indeed, some researchers (Ryan, Brown, & Creswell, 2007) suggest that the association between mindfulness and attachment security is bidirectional. Despite the uncertainty of the relationship between these variables, several tentative hypotheses will be offered in the current study.

Comparison of Mindfulness vs. Relaxation Interventions

One criticism of much of the mindfulness literature is the lack of randomized studies comparing mindfulness interventions with “adequate comparators, which include the expectation of a benefit but exclude the claimed ‘active ingredient’ of the majority of mindfulness-based approaches, i.e. sitting meditation and related practices” (Chiesa & Malinowski, 2011). This criticism is primarily aimed at early mindfulness research, as studies conducted over the last decade or so are more likely to utilize randomized, controlled methodology. Nonetheless, this

concern is relevant and it seems important that any mindfulness intervention utilize an appropriate comparison group.

Relaxation training offers one appropriate point of comparison for the current study design. A significant literature has assessed relaxation protocols and found them to be effective in similar domains (stress, rumination, anxiety) as mindfulness training (for reviews, see Carlson & Hoyle, 1993; Hillenber & Collins, 1982 and Manzoni, Pagnini, Castelnovo, & Molinari, 2008). In addition, in recent years several studies have directly compared mindfulness interventions with relaxation training and generally found mindfulness to be at least as effective (Agee, Danoff-Burg, & Grant, 2009; Jain, et al., 2007). Thus relaxation training, as well as a no-treatment control group, will be utilized in the current study.

CURRENT STUDY

A considerable literature has investigated the role of mindfulness in predicting psychological outcomes. A subset of this research has looked at the effects of mindfulness on interpersonal outcomes, although to date no studies have looked at the effects of mindfulness on individuals dealing with the loss of a non-marital intimate relationship. In addition, most studies assessing breakup distress have been correlational, with few utilizing pre-post designs looking at the effects of specific interventions on adjustment to non-marital relationship dissolution. The aim of the current study is to fill these gaps in the research literature. Specifically, this study will assess the effects of mindfulness training for young adults experiencing post-breakup distress after the end of a non-marital intimate relationship.

Goals and Hypotheses

The first and primary goal of this study is to compare the effects of a mindfulness meditation training condition to those of a relaxation training condition and to a no-treatment condition among individuals dealing with a recent non-marital romantic breakup. Based on previous research (Jain et al., 2007; Sedlmeier et al., 2012), I anticipate that mindfulness meditation will be more effective than both the relaxation training and the no-treatment condition, but that both interventions will be more effective than no treatment at all. In particular, I expect individuals in both treatment conditions to experience greater increases in positive outcomes, including positive affect, post-traumatic growth, and forgiveness, as well as greater reductions in negative outcomes, including depression, breakup distress, difficulty regulating emotion, and anger rumination than individuals in the control condition. In addition, individuals in the mindfulness condition are hypothesized to experience greater post-intervention changes than participants in the relaxation condition.

The second goal of this project is to assess the impact of spirituality on the effects of mindfulness training. The religious and spiritual roots of mindfulness practices suggest that training in the techniques may affect spirituality, as previously described. These changes in spirituality may play a role in the changes observed after mindfulness interventions. In addition, there is some evidence that higher levels of spirituality are linked to higher levels of mindfulness (Kohls, et al., 2009). Thus, I anticipate that participants who show higher levels of baseline spirituality as well as those who experience greater increases in spirituality will benefit more than those who have lower baseline levels of spirituality and those who experience lesser changes during the intervention. In other words, I expect spirituality to be both a moderator and a mediator of the effects of mindfulness on psychological outcomes. Specifically, there will be an interaction between spirituality and mindfulness, such that individuals with high spirituality will benefit more from the intervention than those with lower levels of spirituality. In addition, when controlling for the effects of spirituality on psychological outcomes, the link between mindfulness and outcomes will be reduced or eliminated. Finally, because mindfulness may contain implicitly spiritual elements, individuals in the mindfulness condition are anticipated to show greater increases in levels of spirituality than those in the relaxation and control conditions.

The third goal of the current study is to examine potential links between attachment style and mindfulness/relaxation training. As this is a new area of investigation and there is little guiding theory, this aspect of the study will be more exploratory. Preliminary evidence indicates that insecurely attached individuals – perhaps due to low baseline mindfulness, as well as high baseline distress – show greater improvements as a result of MBSR than securely attached individuals (Cordon et al., 2009). Thus, it is possible that individuals with an insecure attachment style will show lower levels of initial mindfulness and higher levels of psychological distress and

will experience greater increases in positive outcomes (positive emotion, post-traumatic growth, and forgiveness) and greater decreases in negative outcomes (depression, breakup distress, poor emotion regulation, and anger rumination) as a result of the mindfulness intervention. It is also possible that insecurely attached individuals may show higher rates of attrition (see Cordon et al., 2009), reduced adherence to the treatment protocol, and less responsiveness to the intervention due its potentially distress-producing aspects than securely attached individuals. Thus, participants with insecure attachment styles may be more responsive to the relaxation training condition, which is likely to be less anxiety-provoking than the mindfulness intervention. In other words, attachment style is likely to moderate the influence of mindfulness on psychological outcomes, such that insecurely attached individuals will benefit less from mindfulness than from relaxation training, whereas securely attached individuals will benefit more from training in mindfulness than relaxation. In both intervention conditions, however, insecurely-attached participants will benefit more than securely attached participants.

In summary, the study hypotheses include:

- 1a) Individuals in the mindfulness condition will experience greater increases in positive outcomes (positive affect and emotion regulation) and greater declines in negative outcomes (angry rumination, depression, breakup distress) than individuals in both the relaxation and control conditions
- 1b) Although individuals in the relaxation condition will experience fewer changes than those in the mindfulness condition, they will show greater increases in positive outcomes (positive affect and emotion regulation) and greater declines in negative outcomes (angry rumination, depression, breakup distress) than individuals in the control condition

2a) Due to inherently spiritual aspects of mindfulness, participants in the mindfulness condition will show greater increases in spirituality as measured by the DSES than individuals in the relaxation and control conditions.

2b) Participants who show higher levels of baseline spirituality as well as those who experience greater increases in spirituality will benefit more from the mindfulness intervention than those who have lower baseline levels of spirituality and those who experience lesser changes in spirituality during the intervention.

2c) Spirituality will mediate the effect of mindfulness on psychological outcomes. Specifically, when controlling for the effects of spirituality on psychological outcomes, the link between mindfulness and outcomes will be reduced.

2d) Spirituality will moderate the influence of treatment condition on psychological outcomes, such that individuals with high spirituality will benefit more from the mindfulness intervention than those with lower levels of spirituality, whereas spirituality will not impact the relationship between relaxation and psychological outcomes.

3a) Individuals with an insecure attachment style will show lower levels of initial mindfulness and higher levels of baseline psychological distress (angry rumination, depression, poor emotion regulation, and breakup distress) than individuals with a secure attachment style

3b) Individuals with an insecure attachment style will experience greater increases in positive outcomes (positive affect and emotion regulation) and greater decreases in negative outcomes (angry rumination, depression, breakup distress) as a result of both the mindfulness and the relaxation interventions than individuals with a secure attachment style

3c) Attachment style will moderate the influence of treatment condition on psychological outcomes, such that participants with insecure attachment styles will be more responsive to the relaxation training condition, which is likely to be less anxiety-provoking than the mindfulness intervention. However, securely attached individuals will benefit more from mindfulness than relaxation.

Overview of the Study Design

The study took place online. Although mindfulness training typically occurs in-person, in group settings where individuals can develop relationships with other participants and their mindfulness teacher, several recent studies suggest that an online methodology may also be effective and appropriate, especially with young adults. For instance, a pilot online mindfulness training by Monshat, Vella-Broderick, Burns, and Herrman (2012) sought feedback about the structure and content of the program from young people who tried the intervention. The results from this trial program suggest that young people are enthusiastic about Internet-based interventions, including mindfulness training. A second recent study (Krusche, Cyhlarova, King, & Williams, 2012) utilized an online format to deliver a 6-week MBSR/MBCT intervention. Study findings showed a reduction in perceived stress after completion of the intervention, which remained stable after one month. These preliminary findings suggest that an online format is an acceptable, easily accessible, and effective way to deliver mindfulness interventions. Thus, the current study was delivered using an Internet-based approach.

Potential participants were recruited in 100 through 300 level psychology courses. Those who expressed interest were directed to the study website where they were given further information about the current research, including an overview of the nature, purpose, and expected duration of the study, the researcher's affiliation, qualifications, and contact

information, and a statement regarding the potential risks and benefits of participation in the study. They were informed of steps taken to protect their confidentiality, such as being assigned a unique, non-identifiable study identification number and having their contact information stored in a separate database than their responses to the study questions and materials. After being provided with this information and prior to beginning the study, participants were given the option to either provide consent to participate in the study or to choose not to participate and leave the study website. See Appendix C for the full informed consent.

After they provided consent, participants completed pre-study questionnaires (Time 1; T1) and created their unique ID consisting of the last three digits of their telephone number, the two digit month of their birth, and the last two letters of their first name. Once they provided consent and completed the pre-study questionnaires, eligible participants were randomly assigned by the primary researcher to one of the three conditions: mindfulness meditation, relaxation training, or no-treatment control. They were sent an email within 48 hours, notifying them of the group to which they had been assigned. Participants in the two treatment conditions were given the URL for the relevant study website and asked to begin the study within 5 days.

Both treatment interventions consisted of a four-session protocol, with sessions completed one week apart. A four-session methodology was chosen because previous research suggests that mindfulness meditation training shows the greatest positive effects during the first 30 days. Programs lasting longer than 30 days do not appear to be incrementally more effective (Sedlmeier et al., 2012).

The first session included brief psychoeducation regarding the effects of stress, especially as related to the breakup of a romantic relationship, and described how mindfulness or relaxation training might be beneficial at reducing the effects of this stress. After this, participants listened

to an audio file of either a mindfulness or relaxation training and were asked to download the file for daily practice at home. The second, third, and fourth sessions included additional psychoeducation and mindfulness or relaxation exercises which were first listened to online and then downloaded for daily practice at home. One week after completion of the fourth session (Time 2; T2), participants completed post-study questionnaires identical to those completed at T1. They completed the same questionnaires again one month after completion of the study (Time 3; T3). Both intervention groups were structured to be as parallel as possible and of similar length. General content was similar, although the exercises and homework assignments were specific to either mindfulness or relaxation training. See Appendices D and E for the complete mindfulness and relaxation training protocols.

Individuals in the no treatment (control) condition completed the study questionnaires at three analogous time points to those participating in the intervention conditions: at the beginning of the study (T1), four weeks later (T2), and an additional four weeks later (T3). After they had completed all three sets of questionnaires, they were given the option to participate in a training program of their choice (relaxation or mindfulness) at their convenience; no participants chose to participate in the intervention after completion of the control group questionnaires. In all three conditions, the administration of the outcome measures was counterbalanced to control for order effects. Specifically, two separate sets of questionnaires were created for each time point (Order A: positive outcome measures first, negative outcome measures second; Order B: negative outcome measures first, positive second).

Participants

Participants were primarily recruited through fliers posted around campus, through Bowling Green State University (BGSU)'s Sona system for advertising research studies for

credit, and through presentations during psychology lectures. Advertisements described a research study looking at stress-reduction techniques for individuals struggling after a recent breakup. Participants were offered the opportunity to receive course credit and/or to be entered into a drawing for one of ten \$20 gift cards as compensation for their participation in the study. See Appendix A for recruitment materials.

Eligible participants were at least 18 years of age, had experienced within the previous 24 months the dissolution of a romantic relationship which lasted a minimum of three months prior to the breakup, and were experiencing ongoing distress related to the termination of that relationship. Potential subjects experiencing suicidality or homicidality based on screening measures and follow-up telephone calls were not included in the study. Instead, they were referred to resources on campus and in the community where they could receive more appropriate and/or intensive services, including the BGSU Counseling Center and the Psychology Department's training clinic, the Psychological Services Center. See Appendix B for screening/pre-intervention materials.

A total of 182 participants, all BGSU undergraduates, were enrolled in the study and completed at least one set of questionnaires. Dropouts were defined as individuals who completed the initial set of questionnaires but failed to complete the second and/or third questionnaires. A majority of participants who dropped out of the study did so between the first and second set of questionnaires, with only four participants completing the second but not the final questionnaires. Most dropouts did not give reasons for doing so; however, those who provided feedback gave three primary reasons: not feeling distressed about the breakup, not having enough time to listen to the study sessions and complete the exercises, and/or being uninterested in further participation. As described in further detail later, analyses of the

pretreatment data were conducted to assess whether there were differences between study completers and dropouts. As expected, attrition in the treatment groups, which required a greater time commitment, was more common than for the control group. See Figure 1 for an overview of the flow of participants through each stage of the study.

Eighty-seven participants completed the full study and were included in the final analyses. A majority (78 percent) of the total participants were female. Participants were also primarily Caucasian (77 percent) and heterosexual (99 percent). Their average age was 20.6 years, with all years in college nearly approximately equally represented. The most commonly represented religious belief systems were Christian-other (predominantly “non-denominational”; 29 percent), Christian-Catholic (26 percent), and Atheist/Agnostic (17 percent). Participants indicated that the relationship which had motivated their participation in the study had lasted an average of nearly two years (19.7 months) and that the breakup occurred 5.4 months prior to the beginning of the study. See Table 1 for full demographic characteristics of the study sample.

Measures

Psychological outcomes. Psychological variables of interest in the current study included depression, anger rumination, overall breakup distress, difficulties in emotion regulation, positive affect, forgiveness, and post-traumatic growth. Because individuals experiencing the loss of an intimate relationship often struggle in these areas, it was anticipated that the intervention would be most likely to create changes in these psychological variables. In addition findings from previous mindfulness interventions suggested that these were key psychological outcomes where improvements might be seen.

Depression. The Patient Health Questionnaire Depression Scale (PHQ-9; Kroenke, Spitzer, & Williams, 2001) was used to measure depressive symptomology in the current study.

The PHQ-9 is a brief 9-item self-report scale used to measure symptoms of depression. The scale discriminates well between symptoms of depression and anxiety. Items are rated over the past two weeks using a four-point scale ranging from 0 “*not at all*” to 3 “*nearly every day*.” An additional, single item assesses severity of symptoms. Sample items include “little interest or pleasure in doing things,” “feeling down, depressed, or hopeless,” and “poor appetite or overeating.” The PHQ-9 shows strong internal consistency, with Cronbach’s alpha ranging from 0.86 to 0.89.

The PHQ-9 can be found in Appendix B.

Anger rumination. Anger rumination was measured by a modified version of the Anger Rumination Scale (ARS; Sukhodolsky, Golub, & Cromwell, 2001). The ARS is a 19 item scale measuring a tendency to think about the emotion of anger; for instance recalling angry moods, thinking about previous experiences of anger, and analyzing past conflicts. Initial factor analyses by Sukhodolsky, et al. (2001) suggest the ARS is a four-factor scale, although the authors acknowledge high intercorrelations between the factors and some inadequate goodness-of-fit indicators and admit the possibility that anger rumination is instead a unidimensional construct. Later factor analyses support this conclusion (Maxwell, 2004); thus, the ARS is treated as a unidimensional scale for the purposes of this study. In addition, for this study, the items and instructions for the scale were modified to reflect rumination specific to a breakup experience. Sample items include “I keep fighting with my ex in my imagination,” “I feel angry about certain things my ex did,” and “Events related to my ex and the breakup still make me angry.” Items are rated on a four-point Likert-type scale from 1 “*Almost Never*” to 4 “*Almost Always*.” The ARS has been shown to have high internal reliability, with an alpha of 0.93 for the overall scale.

The ARS can be found in Appendix B.

Breakup distress. The Breakup Distress Scale (BDS; see Field et al., 2009) was used to measure distress resulting from the breakup. The BDS was adapted from the Inventory of Complicated Grief (ICG; Prigerson et al., 1995). The ICG is a 19 item scale measuring symptoms of grief including preoccupation with thoughts about a deceased person, searching and yearning for a deceased person, feeling stunned about a person's death, and having trouble accepting a person's death. The BDS includes 16 of the original 19 ICG items, with three items unrelated to breakups removed and all other items modified to refer to a breakup rather than death. Sample items include "Memories of the person upset me," "I feel lonely a great deal of the time ever since the breakup," and "I feel disbelief over what happened." Items are rated on a four point scale ranging from 1 "*not at all*" to 5 "*very much so*." The ICG is highly internal consistent, with a Cronbach's alpha of 0.94. In the one study to assess the 16 items of the BDS, internal consistency was not reported.

The BDS can be found in Appendix B.

Positive affect. Positive affect was measured by the positive scale from the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS consists of 20 adjectives, 10 each describing positive and negative emotional states, although only the positive adjectives were used for this study. Sample positive affect items include "determined," "inspired," and "strong." Items are rated on a 5-point Likert-type scale ranging from 1 "*very slightly or not at all*" to 5 "*extremely*." The PANAS is flexible with regard to the time frame measured; in this study respondent will be asked to report on how they have felt during the past week. The scale has been shown to be internally consistent, with Cronbach's alphas ranging from 0.86 to 0.90 for positive affect.

The positive scale of the PANAS (PANAS-Pos) can be found in Appendix B.

Emotion regulation. Emotion regulation was measured using the Difficulties in Emotion Regulation Scales (DERS; Gratz & Roemer, 2004). The DERS is a 36 item scale measuring several aspects of emotion regulation including awareness, understanding, and acceptance of emotions, as well as the ability to respond in desired ways regardless of emotional state. The scale has six subscales, although some research suggests that the Awareness subscale is only modestly intercorrelated with the other subscales and that elimination of these items results in better predictive validity with regard to psychological symptomology (Bardeen, Fergus, & Orcutt, 2012). For the purposes of this study, the shorter version without the Awareness items will be utilized to assess emotion regulation difficulties. Sample items include “When I’m upset, I have difficulty thinking about anything else,” “I am confused about how I feel,” and “I experience my emotions as overwhelming and out of control.” Items are rated on a 5-point Likert-type scale, from 1 “*Almost never (0-10%)*” to 5 “*Almost always (91-100%)*.” The DERS has been shown to be internally consistent, with an alpha of 0.93.

The DERS can be found in Appendix B.

Forgiveness. The Rye Forgiveness Scale (Rye, et al., 2001) was used to measure forgiveness in this study. The Rye is a 15-item scale measuring forgiveness toward a specific offender. Although the scale has two subscales (Absence of Negative; Presence of Positive), a single sum score of forgiveness was used in this study. In addition, the items and instructions were modified to specifically reflect forgiveness of an ex-partner. Sample items include “I wish for good things to happen to my ex,” “I have been able to let go of my anger toward my ex,” and “I think that many of the emotional wounds related to my ex have been healed.” Items are rated on a 5-point Likert-type scale, from 1 “*Strongly Disagree*” to 5 “*Strongly Agree*.” The Rye has been shown to be internally consistent, with an alpha of 0.87.

The Rye can be found in Appendix B.

Post-traumatic growth. The short form of the Posttraumatic Growth Inventory – short form (PTGI-SF) (Cann et al., 2010) was used to assess growth in response to high levels of distress potentially caused by a breakup experience. The PTGI-SF is a 10-item measure that looks at five dimensions of potential change – relating to others, personal strength, new possibilities, life appreciation, and spirituality – in response to struggle. Two of each of the original five items from each dimension are included in the short form. Items are rated on a 6-point scale from 0 “*I did not experience this change*” to 5 “*I experienced this change to a very great degree.*” Sample items include: “stronger than I thought I was” and “a sense of closeness with others.” Internal consistency of the PTGI-SF is between 0.86 and 0.89.

The PTGI can be found in Appendix B.

Mediating/moderating variables.

Mindfulness. The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) was used to assess levels of mindfulness. The FFMQ is a 39-item questionnaire composed of five subscales representing distinct aspects of mindfulness: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experiences. Although the five subscales of the FFMQ are intended to represent different mindfulness factors, there is also evidence that they are part of an overarching mindfulness factor (Baer et al 2008). Several studies have utilized a total score (deBruin, Topper, Muskens, Bögels, & Kamphuis, 2012; Pepping, Davis, & O’Donovan, 2013), rather than analyzing the FFMQ subscales differentially. For the purposes of this study, a total FFMQ score was used in analyses related to mindfulness. Items are measured by a 5-point scale ranging from 1 “*never or very rarely true*” to 5 “*very often or always true.*” Sample items include “When I do

things, my mind wanders off and I'm easily distracted," "I watch my feelings without getting lost in them," and "I pay attention to how my emotions affect my thoughts and behaviors." The subscales of the FFMQ have been shown to have good internal consistency with Cronbach's alphas ranging from 0.75 to 0.91.

The FFMQ can be found in Appendix B.

Spirituality. Spirituality was measured by the Daily Spiritual Experiences Scale (DSES: Underwood, 2006; Underwood, 2011; Underwood & Teresi, 2002). The DSES is widely used in the social sciences to measure changes in ordinary spiritual experiences over time. It is a unidimensional scale, consisting of 16 items, tapping spiritual qualities such as connection with the transcendent, awe, compassionate love, and inner peace. Although several of the items are theistic, others tap more general spiritual experiences. The scale has been tested across a range of religious groups, including atheists and agnostics, and found to be effective, especially due to its allowance of substitution for the idea of "divine" or "higher power" in items referring to "God." Sample items include "I experience a connection to all of life," "I feel God's love for me, through others," and "I feel thankful for my blessings." Items are rated on a six-point scale ranging from 1 "*Many times a day*" to 6 "*Never.*" The DSES has been shown to be internally consistent, with Cronbach's alpha from 0.94 to 0.95.

The DSES can be found in Appendix B.

Attachment. The Experiences in Close Relationships – Revised Questionnaire (ECR-R; Fraley, Waller, & Brennan, 2000) was developed from previous attachment items/scales in an attempt to create an attachment measure which accurately discriminates individuals not just in the high end of the trait ranges of anxiety and avoidance, but also in the low and moderate ends, allowing more precise measurement of attachment security. The ECR-R measures adult/romantic

attachment and is thought to be a reflection of childhood attachment style. Rather than relying on observation, as for the measurement of childhood attachment, the ECR-R is a self-report scale. The ECR-R is a 36 item scale, with two subscales of 18 items representing the anxiety and avoidance dimensions. Sample items include “My desire to be very close sometimes scares people away” (anxiety) and “I prefer not to be too close to romantic partners” (avoidance). Items are rated on 7-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*). Several studies of the psychometric properties of the ECR-R have confirmed its two factor structure and have shown the scale to have good reliability and validity (e.g. Sibley, Fischer, & Liu, 2005; Sibley & Liu, 2004). Fairchild & Finney report strong internal reliability consistency, with Cronbach’s alphas of .92 and .93 for the anxiety and avoidance subscales, respectively.

The ECR-R can be found in Appendix B.

Demographics. Participants were asked a number of demographic questions, including their age, gender, education level, ethnicity, and sexual orientation. They were also asked questions regarding their relationship history and status, including the duration of their recently ended relationship, the amount of time elapsed since the breakup, which partner initiated the breakup, and whether the respondent is currently in a relationship. In addition, they were asked several questions about their religion/spirituality, including their religious/spiritual affiliation, frequency of attendance at religious/spiritual services, and self-assessed levels of religiosity and spirituality.

See Appendix B for a complete listing of demographic questionnaires.

Daily tracking form/practice log. Starting on the first day of the intervention and continuing through the final day of active treatment (28 days total), participants in the meditation and relaxation treatment groups were asked to complete a daily diary indicating whether and for

how long they practiced the relevant technique. The importance of completing the diary was stressed to participants and they were asked to complete the diary retrospectively if they forget a day. Participants were given the option of receiving daily emails and/or text messages (Monshat et al., 2012) reminding them to complete the log. Participants provided a weekly summary of their practice online.

Statistical Analyses

All data analyses were conducted using SPSS 17.0. Prior to analyses, all continuous variables were checked to insure assumptions of normality were met.

Descriptive statistics were generated for baseline demographics and all primary study variables. Comparisons were made to determine whether there were any significant differences based on demographic variables between study completers and dropouts or between participants in the mindfulness, relaxation, and control groups. In addition, the groups were compared on major study variables (attachment style, spirituality, mindfulness, distress, etc) to determine whether there were differences between completers and non-completers or between individuals in the three groups at baseline. Any key variables which differed significantly between groups was controlled for in later analyses.

The three groups were compared using a 3 (group) by 3 (time) analysis of variance (ANCOVA) with repeated measures following the 4-week intervention and after a 4-week follow-up. Moderation effects of spirituality and attachment were tested by including interaction terms with potential moderating variables in three-way ANCOVAs. Possible mediating effects of spirituality were assessed using formal testing with bootstrap samples, rather than using a causal steps approach (Baron and Kenny, 1986), in order to eliminate the risk of Type I and Type II error and to improve statistical power (Preacher & Hayes, 2004). Meditation tests were

conducted utilizing Preacher and Hayes INDIRECT macro (Preacher & Hayes, 2008) with 5000 bootstrap samples and 95 percent confidence intervals. Figure 2 illustrates the meditational analyses. Path c is the total effect between mindfulness and outcomes, including both the direct effect of mindfulness on each outcome {path c'}, as well as the indirect effect of mindfulness on each outcome occurring through spirituality (paths a and b).

RESULTS

Preliminary Analyses

Independent samples t-test were used to assess for order effects between the two different sets of questionnaires. Across all three time points, only scores on the PTGI showed significant differences between the two orders of questionnaires, suggesting that overall the order of presentation of the measures did not differentially influence subjects' responses in a substantial way. Thus, order was not controlled for in data analyses.

All variables were assessed for normality, using skewness and kurtosis statistics, through visual inspection of histograms and Normal Q-Q Plots, and via Shapiro-Wilk normality tests. All variables within all groups approximated normal distributions by two or more tests. When data showed slight deviations, this was typically driven by Time 3 (Follow-up) data, when participants reported lower levels of distress and data approached floor effects. For these reasons, no transformations of data were performed. However, on rare occasions, extreme outliers were replaced with the next largest value when this helped to meet assumptions of normality.

Baseline differences between study completers and those who dropped out prior to completion of the full study were examined for the demographic variables, outcome variables, and hypothesized moderator/mediator variables. A series of one-way analyses of variance (ANOVA) was conducted with continuous variables and Chi-square analyses were run to investigate differences on categorical variables. Results demonstrate that there were no significant differences ($p \leq .05$), with one exception, for demographic variables between those participants who completed only Time 1 (and in some cases Time 2; $n = 91$ and $n = 4$, respectively) and those who completed the full requirements of the study ($n = 87$). Specifically, study completers, as compared to dropouts, attributed greater blame to their partner for problems

leading to the breakup. With regard to outcome and moderator/mediator variables, there were no significant differences between study completers and non-completers, with again one exception: study completers had higher baseline scores on the ARS. Both significant differences suggest selective attrition for individuals who were initially less angry and for those who were less blaming of their partner for relationship problems leading to the breakup. Except where otherwise noted, all further analyses for this study were conducted using only data from study completers.

Reliability analyses. All measures used in the current study were evaluated for internal consistency (Cronbach's alphas) at all time points. Findings indicated that the scales demonstrated adequate reliability with the current sample, ranging from .69 to .97. The lowest reliabilities occurred for the non-reactivity subscale of the FFMQ (.73, .69, and .75 at pre, post, and follow-up time points, respectively). Nonetheless, this subscale was retained due to high internal consistency for FFMQ sum with non-reactivity included (.88 to .90), with only incremental improvement with the subscale removed (.92 to .93). All reliabilities for all other scales at all time points were .74 or higher, with nearly all in the .80s and .90s. See Table 2 for all internal consistency estimates for the current sample.

Covariate selection. Baseline differences between individuals assigned to the different conditions were examined using one-way analysis of variance (ANOVA) and chi square tests, for demographic variables, outcome variables, and hypothesized moderator/mediator variables. There were no significant differences between the conditions with regard to demographic, outcome, or moderator/mediator variables. See Table 2 for means and standard deviations for the outcome and moderator/mediator variables across all three time points.

Correlations. In order to identify additional potential covariates, bivariate correlations between participant demographics and outcome measures were calculated. Only those demographic variables which consistently correlated with outcomes (half or more of the study measures) were included as covariates in the analyses. A single variable, global religiousness, met this requirement. Note that this variable was created by combining two separate ratings of religiosity which were highly correlated (religious service attendance and self-rated religiosity) and appeared to be measuring the same construct. Although the initial self-report of breakup distress was also significantly correlated with most study outcome measures, this variable was not included as a covariate since an integral assumption of the study is that breakup distress is a relevant predictor of the chosen study outcomes. See Table 3 for bivariate correlations between demographic and outcome variables.

Hypotheses 1a and 1b: Treatment Condition Effect on Psychological Outcomes

A series of mixed design repeated measures ANCOVAs, with global religiousness entered as a covariate, was conducted for each dependent variable in order to assess potential effects of treatment condition (Mindfulness, Relaxation, Control) on study outcomes across the three time periods (Pre, Post, Follow-up). This procedure – rather than multivariate analysis of variance (MANCOVA) – was selected due to an interest in assessing the impact of each dependent variable separately, rather than considering their collective effects. Thus, a Bonferroni adjustment was utilized in order to control for the inflated risk of Type 1 error due to multiple tests, resulting in a corrected p -value of .007 required for significance. Nonetheless, in order to indicate possible trends in the data – suggested by examination of the plots of score means across the three conditions and three time points – p values of $\leq .05$ have also been noted.

Of particular interest in these analyses was the time x treatment interaction effect, which evaluates the differences among groups within the context of time. In several instances assumptions of equality of variances (Mauchly's test for sphericity) were violated, which is not uncommon in repeated measures designs (Field, 2013). Because these violations were only mild to moderate ($\epsilon > .75$), Huynh-Feldt corrected statistics are reported, when applicable, in order to correct the degrees of freedom and account for the increased risk of Type I error (Field, 2013). Main effects of time are also described briefly in order to understand overall changes in symptoms of breakup distress among study participants over time, regardless of treatment condition. Statistics for all main and interaction effects are shown in Table 4.

Depression. Mauchly's test indicated that the assumption of sphericity had been violated ($\chi^2(2) = 10.77, p = .005$), thus the degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\epsilon = .94$). The results showed no statistically significant time x condition interaction effect for PHQ scores ($F(3.77, 156.28) = 2.24, p = .071$), indicating no statistically significant differences in depression levels for the three treatment conditions over the course of the study.

There was a significant main effect of time for depression ($F(1.88, 78.14) = 7.26, p = .001$), with a statistically significant reduction in PHQ scores over time. This difference was significant when comparing Pre-Post and Pre-FU (p 's $< .001$), but not when comparing Post-FU ($p = .412$), suggesting that the primary decrease in depression symptoms occurred during the main intervention phase of the study, with maintenance of these effects throughout the follow-up period.

Breakup distress. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 11.36, p = .003, \epsilon = .94$), showed no statistically significant time x condition interaction effect for BDS

scores ($F(3.74, 155.38) = 1.79, p = .140$), indicating no statistically significant differences in levels of breakup distress between the three treatment groups over the course of the study.

There was a significant main effect of time for breakup distress ($F(1.87, 77.69) = 16.93, p < .001$), with a statistically significant reduction in BDS scores from the beginning to the end of the study. This difference was significant when comparing Pre-Post and Pre-FU (p 's $< .001$), but not when comparing Post-FU, although the latter approached significance ($p = .017$). As with depression, this suggests that the primary decrease in breakup distress occurred during the main intervention phase of the study, with maintenance but not continuing significant improvements throughout the follow-up portion of the study.

Difficulties in emotion regulation. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 6.55, p = .038, \epsilon = .98$), showed no statistically significant time x condition interaction effect for DERS scores ($F(3.93, 163.25) = 1.12, p = .351$), indicating no statistically significant differences in difficulty regulating emotion between the three treatment conditions over time. In addition, there was no significant main effect of time for emotion regulation.

Anger rumination. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 8.20, p = .017, \epsilon = .97$), showed a near-significant time x condition interaction effect for ARS scores ($F(3.36, 160.42) = 1.51, p = .012$). This suggests a trend toward significant differences between levels of anger rumination among the three treatment conditions over time. In other words, the changes in anger rumination across time varied depending upon treatment type. Visual inspection of the plotted values shows that all groups experienced a similar drop in ARS scores from Pre-Post; however, scores leveled off from Post-FU for both the Relaxation and Control groups, while continuing to drop within the Mindfulness group (see Figure 3). This suggests that

mindfulness may be more effective over time in decreasing anger rumination after a breakup, although the results did not reach significance.

There was also a significant main effect of time for anger rumination ($F(1.93, 80.21) = 10.51, p < .001$), with a statistically significant overall reduction in ARS scores across the study. This difference was significant when comparing Pre-Post and Pre-FU (p 's $< .001$), and approached significance when comparing Post-FU ($p = .010$). Once again, this indicates that the significant decrease in symptoms occurred during the main intervention phase of the study, with maintenance of this benefit – but not further significant improvement – during the follow-up period.

Positive emotion. Analysis of PANAS-Pos scores showed no significant time x condition interaction effect ($F(4, 164) = .98, p = .419$). In other words, there was no difference between levels of positive emotion among the three treatment groups over the course of the study.

There was a near-significant main effect of time for PANAS-Pos scores ($F(2, 82) = 4.44, p = .013$), with a trend toward significance in the increase of positive emotion over time. This difference was significant when comparing Pre-FU ($p < .001$), but not when comparing Pre-Post ($p = .469$) or Post-FU, although the latter approached significance ($p = .047$). This suggests that the increase in positive emotions occurred slowly throughout the full period of the study (from pre to follow-up), rather than occurring primarily during the intervention portion of the study, as seen with the change in several of the negative psychological symptoms described above.

Post-traumatic growth. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 13.77, p = .001, \mathcal{E} = .92$), showed no statistically significant time x condition interaction effect for PTGI scores ($F(3.66, 151.88) = 1.78, p = .141$), indicating no statistically significant

differences in levels of growth between the three treatment groups across the study. In addition, there was no significant main effect of time for post-traumatic growth, with no significant change in PTGI scores over time.

Forgiveness. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 17.63, p < .001, \mathcal{E} = .88$), showed no statistically significant time x condition interaction effect for Rye scores ($F(3.54, 146.76) = 1.78, p = .144$), indicating no statistically significant differences in levels of forgiveness between the three treatment groups over the course of the study.

However, there was a near-significant main effect of time for forgiveness ($F(1.77, 83.38) = 4.19, p = .021$), with a trend toward significance in the change in Rye scores over time. This difference was significant when comparing Pre-Post ($p = .004$) and Pre-FU ($p < .001$), but not when comparing Post-FU, although the latter approached significance ($p = .027$). This suggests that the primary increase in forgiveness occurred during the main intervention phase of the study, with a maintenance of but not continuing significant improvements, throughout the follow-up portion of the study.

Summary of treatment effects for psychological outcomes. The results of these analyses suggest little to no support for Hypothesis 1, with the exception of a near significant difference (without Bonferroni correction) between anger rumination scores in the mindfulness versus relaxation/control groups. Overall, neither mindfulness nor relaxation training was more effective than no-treatment in significantly reducing the symptoms of breakup distress over the time period of the study. Likewise, mindfulness training was not consistently significantly different from relaxation training in reducing breakup distress over time. While main effects of time suggest that participants gradually feel better after a breakup, neither of the current treatment interventions significantly accelerated these changes.

Hypothesis 2a: Effect of Treatment on Spirituality

A mixed design repeated measures ANCOVA was conducted in order to assess potential effects of treatment condition on spirituality, after controlling for global religiousness, across the three time periods. Of particular interest in this analysis was the time x treatment interaction effect, which evaluates the differences among groups within the context of time. The main effect of time is also evaluated in order to assess possible overall changes in spirituality among study participants over time, regardless of treatment condition. Statistics for main and interaction effects are shown in Table 5.

Mauchly's test indicated that the assumption of sphericity had been violated ($\chi^2(2) = 7.71, p = .021$), thus the degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\epsilon = .97$). The results showed no statistically significant time x condition interaction effect for spirituality ($F(3.89, 161.24) = 2.38, p = .056$), indicating no statistically significant differences in levels of spiritual experiences between the three treatment groups over the course of the study. However, this result approached significance and visual inspection of the profile plot showed interesting trends. Specifically, individuals in the treatment groups (both Mindfulness and Relaxation) experienced an initial decline in DSES scores from Pre-Post, followed by an even greater increase (especially for the mindfulness group) in DSES scores from Post-FU. In contrast, those in the no-treatment control experienced an increase in DSES scores from Pre-Post, followed by a nearly equivalent decline from Post-FU. This offers some evidence that those receiving treatment experienced greater increases in spirituality, especially for Mindfulness, than those receiving no treatment, over the course of the study. Although this result did not reach statistical significance, visual inspection of the plotted scores suggests a possible trend over time based on treatment condition. (See Figure 4).

There was no-significant main effect of time for spirituality ($F(1.94, 80.62) = 0.12, p = .886$), with no differences in DSES scores across study participants as a whole. Overall, these results indicate that the hypothesis that those in the mindfulness group would experience greater increases in spirituality than those in the relaxation and control groups was, at best, only marginally supported.

Hypothesis 2b: Effect of Baseline Spirituality on Mindfulness Treatment Outcomes

Due to conceptual overlap between hypotheses 2b and 2d, as well as the small sample size and reduced power which would occur after dividing the mindfulness group into low versus high spirituality, this hypothesis was not directly tested. Instead, the relationship between spirituality and outcomes was explored by testing the moderating effects of spirituality. See Hypothesis 2d below.

Hypothesis 2c: Spirituality as Mediator of Psychological Outcomes

Mediation tests the hypothesis that the association between a predictor and outcome variable can be fully or partially accounted for by a third, mediating, variable. Mediation helps to partial out the direct effects (independent to dependent variable) from the indirect effects (through the mediating variable) in an attempt to explain the causal mechanism by which an independent variable affects a dependent variable (Preacher & Hayes, 2008). In contemporary mediation techniques, especially with smaller sample sizes, a significant indirect effect indicates mediation. A significant result suggests that a large proportion of the shared variance between the independent and dependent variables is shared by the mediating variable (Jose, 2013).

Although modern mediation theory does not require a direct association between the independent and dependent variables in order to test indirect effects (Hayes, 2009; Rucker, Preacher, Tormala, & Petty, 2011), this was nonetheless explored prior to mediation analyses to

better understand the nature of the relationship between mindfulness and the outcome measures. Hierarchical regression analysis was used to assess which psychological outcomes were significantly predicted by mindfulness. In step 1 of each analysis, global religiousness was entered as a control, then mindfulness scores (baseline FFMQ) were entered in Step 2. Change in outcome scores from T1 to T3 was used as the dependent variable. Results of initial hierarchical regressions are shown in Table 6.

Results of the regression analyses showed that, after controlling for global religiousness, mindfulness significantly predicted changes in all negative outcomes, but no positive outcomes. Lower levels of baseline mindfulness were related to greater decreases in negative outcomes and greater increases in positive outcomes, likely due to the fact that individuals with higher baseline mindfulness showed lower levels of symptomatology at baseline and, accordingly, less room for improvement. Specifically, mindfulness predicted 7.9 percent of the variability in depression scores ($F(1, 84) = 7.33, p = .008$), 5.1 percent of the variability in breakup distress ($F(1, 84) = 4.73, p = .032$), 11.0 percent of the variability in difficulty regulating emotions ($F(1, 84) = 10.37, p = .002$), and 5.1 percent of the variability in anger rumination scores ($F(1, 84) = 4.54, p = .036$). Of note, mindfulness also significantly predicted changes in spirituality ($F(1, 84) = 4.18, p = .046$), accounting for 4.7 percent of the variability in DSES scores, even after controlling for global religiousness.

After exploring the relationship between mindfulness and study outcomes, the mediation analyses for spirituality were conducted for each of the seven outcome measures. Longitudinal spirituality, using change scores (T1 to T3) for DSES, was tested as a potential mediator in each model. Significant mediation is indicated when zero is not contained within the confidence interval of the sampling distribution, indicating that the indirect effect is significantly different

from zero. In four instances, spirituality was shown to mediate the relationship between baseline mindfulness and psychological outcomes (see Table 7). In other words, the indirect effects of mindfulness on outcomes (through spirituality) were significant, suggesting that baseline mindfulness does not account for as much change in psychological outcomes after accounting for the indirect effects which occur through changes in spirituality resulting from mindfulness.

Specifically, the findings indicated that spirituality mediated links between mindfulness and anger rumination ($\beta = .02$), between mindfulness and positive emotions ($\beta = .03$), between mindfulness and post-traumatic growth ($\beta = .04$), and between mindfulness and forgiveness ($\beta = .03$). These results suggest that the effects of mindfulness on psychological distress occur in part through changes in spirituality. In particular, individuals starting the study with low levels of mindfulness tend to experience greater increases in spirituality and a concomitant greater increase in positive outcomes (less anger rumination, greater positive emotions, growth, and forgiveness).

Of note, reversals of the independent and moderating variables were explored in order to assess causality and rule out the possibility of bidirectional effects. In other words, was it possible that mindfulness could also act as a mediator of the relationship between spirituality and psychological outcomes? These analyses showed no mediation effects, i.e. there was no significant difference in the amount of change in psychological outcomes accounted for by spirituality - regardless of whether or not the indirect effects occurring through changes in mindfulness resulting from spirituality were accounted for. In other words, spirituality did not appear to lead to changes in mindfulness which then contributed to changes in outcomes. Instead, the links between mindfulness and psychological outcomes appeared to be mediated by spirituality.

In summary, the results of these analyses partially supported the study hypothesis regarding the meditational effects of spirituality on the relationship between mindfulness and psychological outcomes. Spirituality significantly mediated the association of mindfulness with anger rumination, positive emotions, post-traumatic growth, and forgiveness. However, spirituality did not significantly impact the association of mindfulness with depression, breakup distress, or emotion regulation.

Hypothesis 2d: Spirituality as Moderator of Psychological Outcomes

In order to test the hypothesis that level of baseline spirituality moderated the effect of treatment condition on psychological outcomes across the course of the study, the time x condition x spirituality interaction was entered into each of the ANCOVA models from Hypothesis 1. Because only the comparison between treatment groups was of interest, control participants were excluded from these analyses. Note that dividing the sample into further subgroups reduced the power for detecting statistical differences. Nonetheless, these analyses were conducted as a first attempt to identify potential moderating effects of spirituality.

In contrast to the study hypothesis, there were no significant three-way interactions between spirituality, treatment condition, and time. This indicates that the relationship between treatment condition and outcomes over time was not significantly different between high versus low spirituality participants for any of the breakup distress outcomes. All three way interactions results are shown in Table 8.

Hypothesis 3a: Attachment Related to Baseline Mindfulness and Psychological Measures

Analysis of attrition rates by attachment style were assessed using Chi-square tests. Contrary to expectation, there were no significant differences in attrition between securely and insecurely attached individuals both overall ($p = .332$ among all participants), nor among those

randomized to one of the two treatment groups ($p = .165$ after excluding the control group). This suggests that insecure individuals did not appear to have more significant difficulty than secure individuals in tolerating the mindfulness and/or relaxation interventions.

A series of hierarchical linear regression analyses was used to test the hypothesis that individuals with less secure attachment would show lower levels of baseline mindfulness and higher levels of baseline psychological distress than individuals with more secure attachment. Because this hypothesis involved baseline characteristics, all subjects, including dropouts, were included in these analyses. In step 1 of each analysis, global religiousness was entered as a control. In step 2 of each analysis, total attachment score was entered as a continuous variable. This hypothesis was fully supported, with one exception (Mindfulness – Observing subscale). Results of the regression analyses are summarized in Tables 9 and 10.

Baseline attachment and mindfulness. As anticipated, more secure baseline attachment significantly predicted baseline total mindfulness ($\Delta R^2 = .258$, $F = 31.28$, $p = .000$), after controlling for global religiousness. Level of attachment predicted approximately 25.8 percent of the baseline variability in overall mindfulness, with more securely attached individuals exhibiting higher levels of baseline mindfulness. Level of attachment also predicted four of the five subscales of mindfulness.

Specifically, baseline attachment was predictive of all but the Observing subscale of the FFMQ ($F = 2.712$, $p = .069$), accounting for only 2.4 percent of the variability in the Observing factor. Level of attachment predicted 13.7 percent of the variability in the Describing subscale ($F = 14.352$, $p = .000$), 13.9 percent of the variability in the Acting with Awareness subscale ($F = 14.599$, $p = .000$), 21.5 percent of the variability in the Non-Judging subscale ($F = 24.546$, $p =$

.000), and 5.0 percent of the variability in the Non-Reacting subscale ($F = 4.814, p = .009$). In all instances, greater attachment security was related to higher levels of mindfulness.

Baseline attachment and negative outcomes. Level of baseline attachment was also a significant predictor of all negative baseline outcome variables in the anticipated direction. Attachment security significantly predicted depression levels ($F = 20.202, p = .000$), accounting for 16.4 percent of the variability in PHQ scores at baseline. Attachment security also significantly predicted breakup distress ($F = 7.540, p = .001$), accounting for 7.7 percent of the variability in baseline BDS scores. Difficulty regulating emotion was also significantly predicted by attachment security ($F = 26.792, p = .000$), with attachment accounting for 23.0 percent of the variability in baseline DERS scores. Finally, attachment security was a significant predictor of anger rumination ($F = 9.577, p = .000$), accounting for 9.1 percent of the variability in baseline ARS scores. In all instances, higher levels of attachment security were related to lower levels of reported negative symptoms.

Baseline attachment and positive outcomes. Overall baseline attachment was also a significant predictor of all positive baseline outcome measures in the hypothesized direction. Attachment security predicted positive emotional experiences ($F = 13.645, p = .000$), accounting for 8.5 percent of the variation in baseline PANAS-Pos scores. Attachment also significantly predicted baseline growth scores ($F = 6.617, p = .002$), accounting for 2.3 percent of baseline variability in PTGI scores. Level of forgiveness was also significantly predicted by baseline attachment ($F = 15.684, p = .000$), with attachment security accounting for 10.9 percent of the variability in Rye scale scores. In all instances, higher levels of attachment security were related to higher levels of reported positive baseline outcome variables.

Baseline attachment and spirituality. Of note, level of attachment also significantly predicted spirituality at baseline as measured by the DSES ($F = 87.318, p = .000$), even after controlling for the effects of global religiousness. Specifically, baseline attachment predicted 1.6 percent of the variation in baseline DSES scores, with more securely attached individuals endorsing higher levels of daily spiritual experiences.

Hypothesis 3b: Attachment Related to Psychological Outcomes

Respondents' attachment style was classified based upon Fraley's (Fraley et al., 2000; Brennan et al., 1998) four-categories: 1) secure (*low anxiety/low avoidance*), 2) anxious/fearful (*high anxiety/low avoidance*), 3) avoidant/preoccupied (*low anxiety/high avoidance*), or 4) anxious-avoidant/dismissing-avoidant (*high anxiety/high avoidance*). The four-fold method was used because dichotomizing attachment (secure versus insecure) resulted in loss of information due to differential responding based upon attachment style, especially with regard to avoidant attachment. In addition, due to the study topic, respondents with insecure attachment styles were overrepresented in the sample (59.8 percent of completers), despite an estimated prevalence of only 36-44 percent in the general population (Mickelson, Kessler, & Shaver, 1997), making it somewhat easier to classify them further into different styles of insecure attachment. However, sample sizes are small for the avoidant ($n = 4$) and anxious-avoidant ($n = 9$) groups, suggesting that these results should be considered tentative. Note that because only the comparison between treatment groups was of interest, control participants were excluded from these analyses.

As with above analyses of outcome data, a series of mixed design repeated measures ANCOVAs was utilized in order to assess potential effects of attachment style on study outcomes across the three time periods. Due to the use of multiple tests, a Bonferroni adjustment was utilized to control for the increased risk of Type 1 error, resulting in a corrected p-value of

.007 required for significance. Nonetheless, in order to indicate possible trends in the data - suggested by examination of the plots of score means across the four groups over the course of the study - p values of $\leq .05$ are also noted.

Note that for several variables, Shapiro-Wilk tests indicated violation of assumptions of normality. However, when data showed deviations, this was typically driven by securely-attached individuals, who were more likely to endorse lower levels of distress, especially by the end of the study (Time 3/Follow-up), resulting in data approaching floor effects for this group only. For these reasons, no transformations of data were performed, although, on rare occasions, extreme outliers were replaced with the next largest value when this helped to meet assumptions of normality.

As before, the interaction effect (time x group) was of particular interest in these analyses in order to evaluate changes in outcomes over time based on attachment style. When the assumption of equality of variances (Mauchly's test for sphericity) was violated, Huynh-Feldt corrected statistics were reported in order to correct the degrees of freedom and account for the increased risk of Type I error (Field, 2013). Main effects of attachment are also described briefly in order to understand persistent differences in levels of breakup distress based on attachment style generally, without taking into consideration the effect of time. Statistics for all main and interaction effects are shown in Table 11.

Depression. ANCOVA results, using the Huynh-Feldt correction ($\chi^2(2) = 18.26, p = .000, (\mathcal{E} = .85)$) showed a near-significant time x group interaction effect for PHQ scores ($F(5.08, 86.35) = 2.71, p = .025$), indicating a trend toward significantly different changes in levels of depression based on attachment type in the context of time. Visual inspection of the plotted values suggests that anxious-avoidant individuals benefitted the most from treatment over the

course of the study, with the greatest decline among study participants, in PHQ scores. (See Figure 5).

There was also a significant main effect of attachment on depression ($F(3, 51) = 7.87, p < .001$), with a statistically significant difference in PHQ scores relative to attachment type. This difference was significant when comparing individuals with a secure attachment style to those with anxious attachment ($p = .029$) and those with anxious-avoidant attachment ($p < .001$). Individuals with an avoidant attachment style were also significantly different from those with an anxious-avoidant attachment style ($p = .012$). Examination of the plotted values shows fewer overall depression symptoms among those with secure and avoidant attachment styles, with participants with anxious-avoidant styles of attachment experiencing the highest levels of depression and anxiously attached individuals in the middle.

Breakup distress. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 10.67, p = .005, \mathcal{E} = .93$) showed no statistically significant time x group interaction effect for BDS scores ($F(5.59, 95.08) = 1.94, p = .086$), indicating no statistically significant differences in levels of breakup distress between different attachment styles over the course of the study.

There was, however, a near-significant main effect of attachment for breakup distress ($F(3, 51) = 3.37, p < .025$), with a trend toward significant differences in BDS scores based on attachment style. Although no between groups differences were statistically significant, visual inspection of the plotted values suggests that, again, secure and avoidant styles of attachment were related to lower levels of distress, whereas anxious and anxious-avoidant styles were related to higher distress.

Difficulties in emotion regulation. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 6.85, p = .033, \mathcal{E} = .99$) showed a near-significant time x group interaction effect for

DERS scores ($F(5.93, 100.80) = 2.28, p = .043$), indicating a trend toward significant differences in difficulty regulating emotion based on attachment style over time. Visual inspection of the plotted values suggests that individuals with an avoidant attachment style showed slightly increased difficulties regulating emotion during the course of treatment, whereas all other participants experienced fewer emotion regulation difficulties during the study. (See Figure 6).

Results also showed a significant main effect of attachment ($F(3, 51) = 8.85, p < .001$), for emotion regulation, with statistically significant differences in DERS scores relative to attachment type. In particular, individuals with an anxious-avoidant attachment style had DERS scores significantly different (higher) from those of all other participants (p 's $\leq .003$). Secure and avoidant attachment styles had the lowest levels of symptoms with regard to difficulty regulating emotion.

Anger rumination. ANCOVA results, with the Huynh-Feldt correction ($\chi^2(2) = 10.85, p = .004, \mathcal{E} = .93$) showed no-significant time x group interaction effect for ARS scores ($F(5.58, 94.83) = 1.22, p = .304$). In addition, there was no significant main effect of attachment ($F(3, 51) = 2.32, p = .086$) for anger rumination.

Positive emotion. ANCOVA results showed a significant time x group interaction effect for PANAS-Pos scores ($F(6, 100) = 3.34, p = .005$), indicating a statistically-significant different pattern of positive emotion levels over time among individuals with different attachment styles. Specifically, all participants except those with an avoidant attachment style, experienced an increase in positive emotions over the course of the study; in contrast, avoidantly-attached individuals experienced a decline in positive emotions from the beginning to the end of the study. Tests of simple main effects showed a statistically significant difference in positive emotions between attachment styles at both Pre ($F(3, 52) = 3.18, p = .031$) and Post ($F(3, 52) =$

5.74, $p = .002$). Specifically, prior to the intervention (Pre), individuals with avoidant attachment showed the highest levels of positive emotion – with statistically significantly higher levels than those with anxious avoidant attachment ($MD = 14.86$, $SE = 5.13$, $p = .027$). After the intervention (Post), due to a decline in positive emotions among individuals with avoidant attachment, those participants showed the lowest levels of positive emotion – statistically significantly lower than participants with a secure attachment style ($MD = 12.21$, $SE = 3.23$, $p = .002$). There was no simple main effect of attachment at follow-up for positive emotion ($F(3, 52) = 1.71$, $p = .177$), indicating no significant differences based on attachment style. (See Figure 7.

Post-traumatic growth. ANCOVA results, using the Huynh-Feldt correction ($\chi^2(2) = 8.67$, $p = .013$, $\mathcal{E} = .96$) showed no statistically significant time x group interaction effect for PTGI scores ($F(5.76, 97.93) = 1.25$, $p = .289$), indicating no statistically significant differences in levels of growth across attachment styles over time. In addition, there was no significant main effect of attachment for post-traumatic growth ($F(3,51) = .76$, $p = .525$), with no significant differences in levels of growth among groups.

Forgiveness. ANCOVA results, using the Huynh-Feldt correction ($\chi^2(2) = 6.17$, $p = .046$, $\mathcal{E} = .99$), showed a statistically significant time x group interaction effect for Rye scores ($F(6, 101.93) = 3.27$, $p = .006$), indicating a statistically significant difference in change in forgiveness based on attachment style over the course of the study. Visual inspection of the plotted values suggests that individuals with an avoidant attachment style showed decreasing levels of forgiveness during the course of the study, whereas all other participants experienced levels of forgiveness that either remained steady (secure attachment style) or increased during the course of the study. Tests of simple main effects showed a statistically significant difference in forgiveness between attachment styles at both Pre ($F(3, 52) = 6.50$, $p = .001$) and Post ($F(3, 52)$

= 3.39, $p = .025$). Specifically, prior to the intervention (Pre), individuals with a secure attachment style showed significantly higher levels of forgiveness than those with anxious ($MD = 10.15$, $SE = 2.70$, $p = .002$) and anxious avoidant attachment ($MD = 11.05$, $SE = 3.56$, $p = .016$). After the intervention (Post), individuals with secure attachment showed a significantly higher level of forgiveness than only participants with an anxious-avoidant attachment style ($MD = 10.22$, $SE = 3.68$, $p = .037$). There was no simple main effect of attachment at follow-up for forgiveness ($F(3, 52) = 1.11$, $p = .355$), indicating no significant differences based on attachment style. (See Figure 8).

Summary of treatment effects of attachment on psychological outcomes. The results of these analyses offer moderate support for the hypothesis that attachment style would differentially impact changes in symptoms of breakup distress during the course of treatment. Specifically, attachment style resulted in different patterns of responding over time after a breakup with regard to positive emotion and forgiveness (statistically significant) and depressive symptoms and emotion regulation (near-significance); but did not appear to affect patterns of reported breakup distress, anger rumination, or post-traumatic growth. In most instances, individuals with secure and avoidant attachment styles also reported generally lower levels of distress than individuals with anxious and anxious-avoidant attachment styles, without regard to the effects of time.

Hypothesis 3c: Attachment Security as Moderator of Psychological Outcomes

In order to test the hypothesis that level of attachment moderated the effect of treatment condition on psychological outcomes across the course of the study, the time x condition x attachment interaction was entered into each of the ANCOVA models from Hypothesis 1. Because only the comparison between treatment groups was of interest, control participants were

excluded from these analyses. Note that dividing the sample into further sub-groups reduced the power for detecting statistical differences. Nonetheless, these analyses were conducted as a first effort to identify potential moderating effects of attachment.

In contrast to the study hypothesis, there were no significant three-way interactions between attachment, treatment condition, and time. This indicates that the relationship between treatment condition and measures of breakup distress was not significantly different between securely versus insecurely attached participants for any of the study outcomes. All three way interactions results are shown in Table 12.

POST HOC ANALYSES

Following results of the planned analyses, two sets of post-hoc analyses were conducted. The first was concerned with the possibility that controlling for global religiousness might have obscured study findings. In other words, did controlling for variations in religiousness conceal changes in psychological outcomes over time? This was especially salient given the hypothesis that the spiritual components of mindfulness might make it more effective than relaxation at improving post-breakup distress. The second set of post-hoc analyses looked at whether there might be differences in outcomes among individuals who practiced more or less consistently between sessions and/or during the follow-up period. Given the lack of any practice minimum for inclusion of participants' data in study analyses, it seemed feasible that assessing differences between individuals who practiced greater and lesser amounts might yield effects of treatment condition on study outcomes.

The first set of post hoc analyses consisted of re-running statistics for study hypotheses related to treatment, *without* controlling for global religiousness. Overall, the general pattern of results did not change in any substantial or consistent way regardless of whether global religiousness was used as a covariate. Excluding the global religiousness control resulted in only one difference with regard to treatment effects. Specifically, spirituality no longer functioned as a mediator of the relationship between mindfulness and positive emotion (95% bias corrected, accelerated confidence interval (-.09, .00). Results of meditational analyses without the global religiousness control can be found in Table 13.

In order to run the second set of post hoc analyses, respondents were first dichotomized into two categories. "Low practice" participants were those who practiced, on average, less than 30 minutes per week over the course of the eight-week study (28 participants; mean total practice

= 13 minutes per week). “High practice” respondents were those who practiced, on average, 30 minutes or more per week over the course of the study (29 participants; mean total practice = 57.6 minutes per week). Analysis of baseline data showed no statistically significant differences on demographic or outcome measures between low and high practicing respondents.

After individuals were divided into low and high practice groups, statistics were re-run for overall treatment effects (Hypothesis 1a, 1b, and 2a). Separate mediation analyses were run for the low versus high practice groups in order to compare differences between the groups (Hypothesis 2c). Effects of practice for hypotheses 2d and 3c were not run, given already small sample sizes and low power for detecting statistical differences in moderation analyses and the additional sample sub-divisions and further loss of power which would have been required to test interaction effects related to practice.

A series of mixed design repeated measures ANCOVAs, including the time x condition x practice interaction, tested the post-hoc hypothesis that amount of practice would moderate the effect of treatment condition on psychological outcomes across the study. As in primary study analyses, a Bonferroni adjustments was necessary, resulting in a corrected p -value of .007 required for significance. In addition, Huynh-Feldt corrected statistics were utilized when sphericity was violated. Because only the comparison between treatment groups was of interest, control participants were excluded from these analyses. Note that dividing the sample into further subgroups reduced the power for detecting statistical differences. Analyses showed no significant interaction effects of practice on treatment across time, suggesting that with the current sample, low versus high practice time was not related to outcomes across the study.

Post-hoc mediation analyses used Preacher and Hayes INDIRECT macro with 5000 bootstrap samples and 95 percent confidence intervals. Analyses assessed whether mediation

effects of spirituality varied for the high versus low practicing participants by running separate analyses for each group. In no instance for either group did spirituality mediate the effects of mindfulness on outcomes, suggesting that the indirect effects of change in spirituality on the relationship between mindfulness and psychological outcomes were not related to amount of practice in the current study.

DISCUSSION

Although much research to date has explored the efficacy of mindfulness in alleviating symptoms of psychological distress, no currently published study has looked at the potential benefits of mindfulness for individuals struggling with the distress resulting from the dissolution of an intimate relationship. In addition, only a limited subset of the mindfulness research uses a longitudinal approach, instead relying frequently on correlational designs. The purpose of the current study was to address these gaps in the research literature by assessing the relationships between mindfulness, spirituality, attachment, and psychological outcomes after a break-up using a randomized, longitudinal approach.

Specifically, this study compared the effects of a four-week long (plus four-week follow-up) mindfulness intervention with a comparable relaxation intervention, as well as with a no-treatment control group. In addition, the study assessed the impact of respondent characteristics - baseline mindfulness, spirituality, and attachment security - on psychological outcomes; of particular interest, were the potential moderating and/or mediating effects of spirituality and attachment. Contrary to predictions, the mindfulness intervention did not prove more effective than the relaxation intervention or the no-treatment control group. However, several hypotheses were at least partially supported, although others - especially those related to moderation effects - were not. This discussion summarizes the findings of the current study and explores implications and limitations of this research, as well as possibilities for future work.

Mindfulness (Treatment Group) and Psychological Outcomes

Contrary to the study hypotheses, there were no statistically significant differences in study outcomes among participants based on treatment group. Neither mindfulness nor relaxation participants showed significantly greater changes in outcomes as compared to the control group.

In addition, individuals assigned to the mindfulness condition did not experience greater changes in outcomes versus individuals in the relaxation group. While there appeared to be a natural alleviation of symptoms across time after a breakup for the sample as a whole (time main effects), there were no differential effects based on treatment group in the current study. Overall improvements may have been due more to a natural process of healing/maturation effects or to the basic process of being in a study, responding to questionnaires, and/or thinking about one's breakup.

The most parsimonious explanation for the lack of significant findings is that mindfulness and relaxation interventions are not well-suited to the treatment of people dealing with the after-effects of romantic breakups. There are several reasons though why this conclusion may be premature. First, visual inspection of the profile plots showed a consistent, albeit statistically insignificant, pattern of greater improvement for participants in the treatment conditions versus control, and, in several instances, greater improvements for the mindfulness group versus relaxation. In addition, there was a trend toward significance for the reduction in ARS scores (without Bonferroni correction for multiple tests) which suggests that mindfulness could be slightly more effective than relaxation and no-treatment over time in decreasing anger rumination after a breakup.

While the current study findings did not support the hypothesis that the treatments would produce positive effects, it is possible that the lack of study findings is related to elements of the study design. For instance, the sample size - although comparable to those in other research studies - was relatively small and may have had insufficient power for detecting treatment effects. In addition, the treatment dose may have been insufficient, either in terms of amount of practice between sessions or the total length of the intervention. While respondents were asked to

report the amount of time they practiced each week, the study did not require a minimum amount of practice in order for participants' data to be included in the final analyses, nor was there any check on the accuracy of respondents' self-report. For instance, there was no confirmation that participants actually logged in to view the intervention each week and no test of understanding of the skills and information contained in each session. In addition, while analyses based on low versus high practicing individual also did not yield significant results, even "high" practicing participants did not complete the exercises at or above the minimum suggested level (averaging 58 minutes per week, compared to the suggested 100 minute minimum). This may have, in part, been related to the online nature of the study, in which individuals were unable to develop relationships with a group leader and/or other study participants and to easily get answers to any questions they may have had. Also, although four-week mindfulness interventions have been utilized in previous research studies (Jain et al., 2007), many mindfulness interventions are longer (see Chiesa and Seretti, 2009 meta-analysis). The standard Mindfulness Based Stress Reduction program, for example, consists of eight two-and-one-half hour sessions, with 45 minutes of practice most days in between sessions; some mindfulness programs extend as long as 10 weeks. In addition, some follow up periods in similar studies can last up to three months. Future studies using longer or more intensive interventions, larger sample sizes, stricter practice requirements, face-to-face interventions, and/or other treatment modifications might generate statistically significant findings.

Alternatively, because the majority of participants in the study were Christian, some individuals may have been reluctant to participate fully in the intervention, due to fears regarding its non-Christian roots, and thus not have fully benefitted from it. In fact, this problem may have also affected atheist/agnostic participants aware of the intervention's spiritual roots. Future

studies may want to probe participants' reactions to the intervention, especially perceptions of its spiritual nature, in order to assess this possibility. More detailed studies might also assess whether differences between participants in their religious/spiritual identifications moderate the effects of treatment on outcomes, although these tests will require a larger and more specific sample.

Finally, it seems plausible that the type of mindfulness exercises used in this study was not well-suited for addressing the specific psychological challenges and struggles faced by individuals experiencing a breakup. The exercises in this study were generally body-focused (e.g., scanning the body, noting breath sensations in the abdominal area, and paying attention to bodily sensation in specific parts and within the body as a singular entity), which may have contributed to the lack of differentiation between mindfulness and relaxation group outcomes. A mindfulness program including more relationally-based mindfulness exercises, such as loving kindness meditation (e.g., Theravada Buddhism's "Metta" or Tibetan Buddhism's "Tonglen") may have been more effective in creating changes in psychological outcomes related to the experiences of a breakup. This seems especially relevant to outcomes such as forgiveness, positive emotions, and anger rumination.

Mindfulness and Spirituality

There was limited support for the hypothesis that the mindfulness intervention, as compared to the relaxation and control groups, would increase spirituality among study participants. Visual inspection of the profile plots, as well as statistical significance tests, suggested a trend toward increased spirituality within the mindfulness group, however, the results were not statistically significant. The limited statistical power of this study and dose of the intervention noted above could also account for these non-significant findings. Alternatively,

as also noted above, participants' awareness of the Buddhist/spiritual roots of mindfulness may have impacted their full participation in and/or responsiveness to the intervention.

In addition, it is possible that the measure of spirituality used in this research did not adequately capture changes in spirituality during the course of the study. For instance, due to the range of religious/spiritual beliefs represented in this sample, it is possible that the DSES items did not reflect the spiritual experiences of all participants. The DSES was chosen for this study because it captured non-theistic elements of spirituality (e.g. selfless caring for others, inner peace, thankfulness) and allowed for substitution of other representations of the divine for the active/personal "God" referred to in some of the questions. Nonetheless, items referring to an active, personal Being – regardless of language utilized – may not have been meaningful to the nearly one-third of the sample who did not identify with any specific religious tradition.

It is also possible that the DSES did not adequately capture the type of spiritual changes brought about by mindfulness training. These potentially include transcendence, boundlessness, ultimacy, and interconnectedness (Bergemann, Siegel, Belzer, Siegel, & Feuille, 2013). Many commonly-utilized spirituality measures (Spiritual Well Being Scale, Paloutzian & Ellison, 1982; Spiritual Transcendence Index; Seidlitz et al., 2002) - like the DSES - use theistic language and/or imagery, which is perhaps not resonant with non-theistic participants and/or does not capture the domains of influence where mindfulness practices operate.

In summary then, choosing appropriate scales may be critical in assessing the nuances of spiritual experience and the interrelationships between mindfulness, spirituality, and psychological outcomes. Future studies may choose to utilize multiple spirituality scales, each reflecting different aspects of religious/spiritual experience, in order to more comprehensively assess which facets of spirituality influence or are influenced by mindfulness. Alternatively,

future studies could focus on a homogeneous subset of participants (e.g. all Christian or all agnostic/atheist) and select scales appropriate to that sample. Finally, it could be helpful to develop a scale that focuses more specifically on aspects of spirituality thought to be related to mindfulness training.

A second hypothesis related to spirituality - that it would moderate the relationship between treatment condition and psychological distress - was also not supported. There was no statistically significant difference between the effects of the two treatment conditions on distress based on level of spirituality for any of the study outcomes. Given the relationship between higher levels of spirituality and generally lower levels of baseline distress, it may not be altogether surprising that high spirituality participants did not benefit more from the mindfulness intervention. However, the inverse finding – that individuals with lower levels of spirituality would benefit more from the mindfulness intervention – was also not supported. Here again, the measure of baseline spirituality may have been inadequate, or, alternatively, dichotomization of respondents into high and low spirituality groups may have resulted in a loss of information about potential relationships among the variables.

However, mediation analyses of the relationship between baseline mindfulness, changes in spirituality, and psychological outcomes, indicated that state/trait mindfulness is related through spirituality to changes in psychological distress following a breakup. In particular, spirituality mediated the relationship between mindfulness and four study outcomes (anger rumination, positive emotions, post-traumatic growth, and forgiveness). Individuals with lower initial levels of mindfulness experienced greater increases in spirituality and, concomitantly, greater changes in positive outcomes. These findings suggest that the effects of mindfulness on psychological distress occur in part through changes in spirituality. Thus, while the mindfulness

intervention itself did not significantly increase spirituality, and spirituality did not moderate the effects of treatment, spirituality did mediate the relationship between trait mindfulness and psychological outcomes. Spirituality does appear to play some role in how mindfulness contributes to improvements in psychological distress after a breakup.

It appears then that the spiritual aspects of mindfulness may be important, given the links between increased spirituality and greater improvements in psychological outcomes shown by the mediation analyses. It follows that interventions that increase spirituality may yield stronger outcomes. Further development, study, and evaluation of spirituality-integrated mindfulness programs seems warranted. Targeting of individuals with lower baseline levels of spirituality (and higher levels of distress) may also be appropriate given the benefits these groups showed in this study. In addition, it could be useful to identify individuals who are most likely to benefit from the spiritual aspects of mindfulness and/or to experience increases in spirituality as a result of mindfulness training. For instance, individuals with certain personal characteristics (e.g. those less hostile to mindfulness due to its Buddhist origins; those for whom the breakup represents an existential and/or life crisis) may be able to gain more from the intervention than others.

Mindfulness and Attachment

There was strong support for the hypothesis that less secure baseline attachment would be related to lower levels of mindfulness and higher levels of distress. Less securely attached individuals showed lower levels of all facets of mindfulness, except for the Observe subscale. This fits with previous research on the FFMQ (Baer et al., 2008), in which the Observe subscale was found to be a less valid indicator of a global mindfulness construct than other subscales, especially among non-meditators. Less securely attached participants also showed higher levels of baseline psychological symptoms, as measured by all positive and negative outcome

measures. These findings suggest that less securely attached individuals have a greater need for post-breakup interventions and more room for improvement with regard to both personal mindfulness and psychological distress.

In addition, there was moderate support for the hypothesis that participants with insecure attachment would experience significantly greater alleviation of distress as a result of treatment (mindfulness and relaxation conditions combined) than individuals with secure attachment. In two of seven instances (positive emotion and forgiveness), attachment style resulted in statistically significant differential patterns of responding. For two additional outcomes (depressive symptoms and emotion regulation), the results approached significance (without Bonferroni correction for multiple tests). These findings are somewhat unsurprising given the relationship between less secure attachment and generally higher levels of baseline distress – and the resultant greater room for improvement in symptoms over time among insecurely attached participants.

It is important to note that these findings are based on a four-fold categorization of attachment style - and appear to be driven by individuals with avoidant and, sometimes, anxiously-avoidant, attachment styles. However, in the current study both the avoidant and anxiously-avoidant styles of attachment have a small sample size and, as such, these findings should be considered tentative. In contrast, dichotomization of attachment style into secure versus insecure types did not reveal statistically significant differences. This appears to be primarily a result of markedly different patterns of responding between the different insecure attachment styles. As such, when anxious, avoidant, and anxiously-avoidant types are combined into one overarching “insecure” type, this results in a masking of differences.

In particular, avoidantly-attached (and sometimes anxious-avoidantly attached) participants showed a pattern of change in psychological outcomes which was in contrast to the typical pattern of responding for other individuals. For instance, with regard to forgiveness, individuals with an avoidant style of attachment showed decreases in Rye scale scores throughout the course of the intervention, whereas other participants showed limited change (secure attachment) or increases in Rye scores (anxious and anxious-avoidant attachment). Thus, it appears that in some cases the statistically significant results are due to differences between the three insecure attachment styles rather than between secure versus insecure attachment generally. It seems that avoidantly-attached individuals respond differently to mindfulness and/or relaxation interventions than even other insecurely attached individuals. Future studies might recruit larger samples of insecurely attached individuals only and assess for differential responses between the three insecure attachment styles. However, it may be especially difficult to recruit avoidantly-attached individuals to participate in such interventions due in part to their low representation in the general population, as well as to their likely tendency to deny and/or avoid their distress. In other words, the hypothesis about the relationship between attachment style and psychological distress/outcomes may be more nuanced than originally anticipated. Tentatively, it appears that - avoidantly-attached individuals excepted - non-secure attachment may result in greater positive response to treatment.

The hypothesis that attachment would moderate the relationship between treatment and outcomes was not supported. Participants in the different treatment conditions did not differ in psychological outcomes as a function of their attachment style. Once again, this finding may be related in part to insufficient power to detect statistical differences in this sample after dividing the treatment groups into attachment categories. In addition, it is worth noting that, as opposed to

findings in previous studies (Cordon et al., 2009), attrition rates in the mindfulness group did not vary based on attachment style, which may indicate that the treatment dose was inadequate for yielding differential results based on level of attachment security. In other words, the current intervention appears not to have been as intense as programs such as that used in the Cordon study, in which insecurely attached individuals were twice as likely to drop out prior to completion of the study as securely attached participants.

While it is in some sense positive that the mindfulness program did not show increased attrition for less securely attached individuals, future efforts to identify the moderating effects of attachment style on the links between treatments and outcomes could consider utilizing a more intense mindfulness treatment. A stronger mindfulness program might also have the potential of offering increased benefit to more securely attached individuals. Such improvements in treatment could then be used to individualize programs for sub-groups of participants (e.g., those who vary in their attachment style).

Clinical Implications

Given the prevalence of romantic relationship breakups among young adults, the current study offers valuable insights to clinicians working with teenagers and young adults in clinical settings. The findings provide several clues about the alleviation of symptoms of psychological distress after a breakup. While there appears to be a natural process of improvement over time, people with certain characteristics may benefit more than others. In particular, those individuals with the greatest levels of distress obviously have the greatest opportunities for improvement over time. This typically includes individuals with less secure attachment and those with lower levels of baseline mindfulness. In addition, individuals who experience increases in their level of spirituality (often those with the above characteristics) also appear to show greater improvement

in symptoms, as spirituality in the current study was found to mediate the relationship of trait mindfulness with psychological outcomes - specifically anger rumination, positive emotions, post-traumatic growth, and forgiveness.

In addition, this study offers some support for the idea that mindfulness interventions with a more spiritual component may be of benefit. The current study did not directly test this hypothesis; rather than compare a spiritually explicit vs. non-spiritual form of mindfulness, a non-mindfulness intervention (i.e., relaxation) was chosen as the comparison treatment in this study. However, previous research has offered some support for the notion that spiritually-integrated forms of meditation may enhance the benefits of this intervention (Wachholtz & Pargament, 2005). Given the finding that spirituality acts as a mediator of the link between baseline mindfulness and outcomes, especially within the mindfulness treatment group, it appears plausible that more spiritual mindfulness treatments may facilitate the change in spirituality and thus accentuate the improvement in psychological symptoms. Thus, clinicians may choose to offer spiritually relevant treatment protocols to their clients, especially those exhibiting lower levels of secure attachment, spirituality, and trait mindfulness. Mindfulness interventions which do not contain references to specific religions, dogmas, or theistic concepts but which accentuate other spiritual aspects (e.g., transcendence, ultimacy, or interconnectedness) may be especially useful with agnostic, atheist, and spiritual but not religious individuals, whereas more explicitly religious elements could be of benefit to religiously-affiliated individuals who score low on baseline measures of spirituality.

Limitations and Future Directions

There are several limitations to the current study. The first of these relates to the study sample. While there was a sufficient number of participants to conduct the primary analyses and

to detect moderate effect sizes, the power to detect smaller effects may have been inadequate. In addition, dividing the sample into subgroups for moderation analyses may have limited the power to detect statistical effects; this is especially relevant to the results based on attachment style. Finally, the sample was relatively homogeneous, lacking diversity with respect to race, age, geography, and educational attainment. The homogeneity of the sample limits the generalizability of the results.

In addition, it is possible that the treatment offered in the study did not provide a strong enough “dose” to generate results. Given the fact that some trends toward significant treatment effects did emerge, changes in the study, such as stronger/longer intervention and increased attention to adherence (such as excluding participants who did not practice some minimum amount of time) could conceivably yield more significant findings.

Finally, the measurement of spirituality in this study was problematic in several respects. Given the range of religious and spiritual beliefs represented in the sample, it is unclear whether the measure of spirituality adequately assessed individuals’ spirituality, and consequently, whether it was an appropriate measure of the interrelationships among mindfulness, spirituality, and psychological outcomes. It is also uncertain whether the measure of spirituality in this study accurately captured potential changes in spirituality brought about by the mindfulness intervention. In addition, the measure focused only on positive spirituality, neglecting any exploration of negative aspects of spirituality. This may be relevant given previous findings that negative religious experiences and negative methods of coping can have detrimental effects (see Pargament, 1997) on adjustment. Thus, it could be interesting to examine how some forms of spirituality might mitigate links between mindfulness and psychological well-being, or even be a

sources of problems and struggles, potentially creating negative relationships between mindfulness and adjustment.

Because the relationship between mindfulness, spirituality, attachment and psychological symptoms appears complex, further research on the interrelationship between these variables is warranted. The current findings offer some evidence which can be utilized to develop more targeted research studies. For instance, mediational analyses indicate that spirituality - at least as measured in the current study - appears more likely to impact the relationship between baseline mindfulness and positive outcomes than between mindfulness and negative outcomes. Thus, further research in this area might focus on positive outcomes. Alternatively, studies which incorporate measures of negative spirituality could reveal other kinds of relationship among baseline mindfulness, spirituality, and negative outcomes.

Additionally, studies exploring more nuanced personal spiritual variables and/or utilizing populations from within specific religious traditions could shed light on the role of spirituality in mindfulness training. For instance, would there be differences in responsiveness to mindfulness treatments among various religious/spiritual groups (i.e. Christians versus atheists/agnostics or the spiritual but not religious)? As previously stated, additional or different measures of spirituality could also generate insights about the role of spirituality in mindfulness. Are there specific aspects of spirituality - such as mystical experiences, relationship to a personal/theistic God, or a sense of inner meaning and peace - which are related to improved outcomes? Overall, an increased understanding of which aspects of spirituality are effective for whom could improve the effectiveness of mindfulness training programs, with regard to breakup distress as well as other problems.

With regard to attachment, the results must be considered tentative due to limited sample size after categorizing participants based on attachment style. However, interesting patterns emerged which warrant further exploration, especially with regard to individuals with an avoidant attachment style, who frequently exhibited differential patterns of responding versus other study participants. A sample with a greater proportion of participants with different insecure attachment types - or focusing exclusively on insecurely attached individuals – as previously described, could shed further light on their response styles and the potential effects of mindfulness and/or spirituality for them. Alternatively, it might be useful to explore the relationships between attachment and outcomes based on level of “anxious” and level of “avoidant” responding as two separate dimensions, rather than looking at distinct attachment types or overall attachment security.

Finally, more sophisticated statistical analyses, such as moderated mediation and mediated moderation (Hayes, 2013; Jose, 2013; Muller, Judd, & Yzerbyt, 2005), could be used to further explicate the relationships explored in this study. Newer statistical techniques allow for more nuanced explorations of causal relationships and interactions among variables. As the interrelationships between mindfulness, spirituality, attachment, and psychological outcomes are further understood, more refined research questions can be proposed.

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Table 1

Baseline Demographics by Group

Measure	Mindfulness <i>n</i> (%)	Relaxation <i>n</i> (%)	Control <i>n</i> (%)	Total <i>n</i> (%)
<u>Personal Characteristics</u>				
Gender				
Female	20 (76.9)	26 (86.7)	22 (71.0)	68 (78.2)
Male	6 (23.1)	4 (13.3)	9 (29.0)	19 (21.8)
Year in College				
1 st	6 (23.1)	8 (26.7)	4 (12.9)	18 (20.7)
2 nd	10 (38.5)	8 (26.7)	11 (35.5)	29 (33.3)
3 rd	3 (11.5)	8 (26.7)	8 (25.8)	19 (21.8)
4 th or more	7 (26.9)	6 (20.0)	8 (25.8)	21 (24.1)
Race				
Caucasian	19 (73.1)	26 (86.7)	22 (71.0)	67 (77.0)
Non-Caucasian	7 (26.9)	4 (13.3)	9 (29.0)	20 (23.0)
Sexual Orientation				
Heterosexual	26 (100)	30 (100)	30 (96.8)	86 (98.9)
Non-heterosexual	0	0	1 (3.2)	1(1.1)
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Age (years)	21.5 (7.9)	20.6 (3.9)	20.0 (1.4)	20.6 (5.0)
<u>Religious Characteristics</u>				
Religious Affiliation				
Christian (Protestant)	1 (3.8)	7 (23.3)	1 (3.2)	9 (10.3)
Christian (Catholic)	9 (34.6)	7 (23.3)	7 (22.6)	23 (26.4)
Christian (Other)	7 (26.9)	8 (26.7)	10 (32.3)	25 (28.7)
Atheist/Agnostic	1 (3.7)	6 (20.0)	8 (25.7)	15 (17.1)
Spiritual but not religious	6 (22.2)	2 (6.7)	4 (12.8)	12 (13.7)
Other/no preference	2 (7.7)	0	1 (3.2)	3 (3.4)
Frequency of religious attendance				
Once per week or more	3 (11.5)	5 (16.7)	4 (12.9)	12 (13.8)
A few times per month	6 (23.1)	9 (30.0)	7 (22.6)	22 (25.3)
A few times per year	9 (34.6)	8 (26.7)	7 (22.6)	24 (27.6)
Rarely or never	8 (30.8)	8 (26.7)	13 (41.9)	29 (33.3)
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Religiousness (1 -5)	2.2 (0.85)	2.5 (1.04)	2.0 (1.00)	2.3 (0.98)
Spirituality (1 -5)	2.7 (1.04)	2.8 (1.21)	2.8 (1.37)	2.8 (1.21)
<u>Relationship Characteristics</u>				
Initiator of Breakup				
Self	10 (38.5)	14 (46.7)	14 (45.2)	38 (43.7)
Mutual	4 (15.4)	1 (3.3)	5 (16.1)	10 (11.5)
Partner	12 (46.1)	15 (50.0)	12 (38.7)	39 (44.8)

Cause of Problems				
Self	3 (11.5)	3 (10.0)	4 (12.9)	10 (11.5)
Mutual	9 (34.6)	3 (10.0)	9 (29.0)	21 (24.1)
Partner	14 (53.8)	24 (79.9)	18 (58.1)	56 (64.3)
Previous Breakups				
None	4 (15.4)	8 (26.7)	6 (19.4)	18 (20.9)
One	6 (23.1)	10 (34.5)	10 (32.3)	26 (30.2)
Multiple	16 (61.5)	11 (37.9)	15 (48.4)	42 (48.9)
See Ex-partner				
Never	8 (30.8)	8 (26.7)	10 (32.3)	26 (29.9)
Monthly or less	10 (38.5)	13 (43.3)	9 (29.0)	32 (36.8)
Weekly to monthly	6 (23.0)	7 (23.3)	11 (35.5)	24 (27.6)
Daily	2 (7.7)	2 (6.7)	1 (3.2)	5 (5.7)
Relationship Status				
Not in a relationship	20 (76.9)	20 (66.7)	23 (74.2)	63 (72.4)
In relationship (with ex)	2 (7.7)	2 (6.7)	0	4 (4.6)
In relationship (not with ex)	4 (15.4)	8 (26.7)	8 (25.8)	20 (23.0)
Breakup was sudden				
Disagree	10 (38.5)	13 (43.4)	15 (48.4)	38 (43.7)
Neutral	3 (11.5)	7 (23.3)	4 (12.9)	14 (16.1)
Agree	13 (50.0)	10 (33.4)	12 (38.7)	35 (40.2)
Relationship was not good				
Disagree	14 (53.9)	15 (50.0)	20 (64.5)	49 (56.3)
Neutral	5 (19.2)	8 (26.6)	6 (19.4)	19 (21.8)
Agree	7 (26.9)	7 (23.3)	5 (16.2)	19 (21.8)
Gave self fully to relationship				
Disagree	4 (15.4)	4 (13.3)	4 (12.9)	12 (13.8)
Neutral	2 (7.7)	4 (13.3)	1 (3.2)	7 (8.0)
Agree	20 (76.9)	22 (73.4)	26 (83.9)	68 (78.2)
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Time since breakup (months)	5.1 (4.08)	6.0 (4.14)	5.2 (3.15)	5.4 (3.79)
Length of relationship (months)	21.3 (18.75)	17.9 (16.62)	20.1 (14.96)	19.7 (16.61)
Distress caused by breakup (0-24)	17.1 (4.86)	17.3 (4.90)	17.4 (4.50)	17.2 (4.69)
Current distress from breakup (1-10)	6.1 (2.48)	6.4 (2.47)	6.0 (2.65)	6.2 (2.51)

Table 2

Pre- and Post-Intervention Measures by Group and Time

	Alpha	MG (n=27) M (SD)	RG (n=30) M (SD)	CG (n=32) M (SD)	Total (n=89) M (SD)
ECR-R Overall					
Pre	.91	7.0 (2.02)	7.6 (1.31)	6.7 (1.72)	7.1 (1.72)
Post	.94	6.8 (2.28)	6.9^a (1.41)	6.7 (1.61)	6.8^a (1.77)
Follow-up	.94	6.7 (2.10)	6.9^b (1.51)	6.7 (1.62)	6.8^b (1.73)
ECR-R Anxiety					
Pre	.92	4.0 (1.12)	4.3 (0.93)	3.9 (1.34)	4.1 (1.15)
Post	.95	3.7^b (1.35)	3.9^a (1.18)	3.7 (1.28)	3.8^a (1.26)
Follow-up	.94	3.7 (1.18)	3.8^a (0.99)	3.7 (1.14)	3.7^a (1.09)
ECR-R Avoidance					
Pre	.90	3.0 (1.21)	3.3 (0.92)	2.8 (0.85)	3.1 (1.01)
Post	.93	3.1 (1.34)	3.0^a (0.81)	2.9 (0.85)	3.0 (1.01)
Follow-up	.93	3.0 (1.16)	3.1 (0.99)	3.0 (0.90)	3.1 (1.00)
FFMQ Overall					
Pre	.88	121.2 (21.21)	115.9 (14.96)	119.3 (18.38)	118.7 (18.18)
Post	.90	129.5^a (19.15)	120.5^b (15.04)	120.3 (14.93)	123.2 (16.70) ^a
Follow-up	.88/	132.7^a** (17.00)	120.0 (18.60)	120.5 (13.16)	124.1 (17.13) ^a
FFMQ Observe					
Pre	.74	23.4 (2.91)	25.1 (3.62)	23.3 (3.54)	23.9 (3.46)
Post	.82	26.3^a (5.80)	22.8 (4.47)	25.1 (6.32)	24.7 (5.71)
Follow-up	.84	26.4^a (4.77)	23.6 (6.23)	24.7 (6.14)	24.8 (5.84)
FFMQ Describe					
Pre	.92	26.6 (8.44)	26.5 (6.00)	26.4 (7.81)	26.5 (7.38)
Post	.89	27.2 (7.33)	27.4 (5.45)	25.5 (5.51)	26.7 (6.10)
Follow-up	.91	27.8 (7.57)	26.3 (6.16)	26.3 (5.99)	26.7 (6.52)
FFMQ Act with awareness					
Pre	.91	26.6 (7.26)	23.4 (6.88)	24.5 (6.79)	24.7 (7.01)
Post	.92	26.7 (7.22)	24.6 (7.25)	24.4 (6.25)	25.2 (6.89)
Follow-up	.94	27.3 (6.89)	24.0 (8.30)	23.4 (6.17)	24.8 (7.28)
FFMQ Nonjudge					
Pre	.88	24.4 (7.01)	21.3 (5.23)	24.8 (7.57)	23.5 (6.80)
Post	.90	27.5^a (6.17)	24.7^a (6.49)	24.6 (6.81)	25.5^a (6.57)
Follow-up	.93	28.4^a (6.73)	25.7^a (7.33)	25.5 (6.90)	26.4^a (7.04)
FFMQ Nonreact					
Pre	.73	20.3 (4.94)	19.6 (4.11)	20.3 (4.13)	20.0 (4.35)
Post	.69	21.8^b (3.72)	21.0^b (3.54)	20.8 (3.68)	21.1^a (3.63)
Follow-up	.75	22.8^a (4.19)	20.4 (3.97)	20.7 (3.97)	21.3^a (4.13)
DSES					
Pre	.96	54.2 (22.16)	56.8 (22.23)	50.1 (20.84)	53.6 (21.66)
Post	.97	51.9 (21.24)	55.9 (21.88)	51.5 (19.89)	53.1 (20.84)
Follow-up	.97	57.0^c (22.6)	57.0 (22.24)	48.7 (21.36)	54.0 (22.15)

PHQ					
Pre	.87	8.1 (6.42)	7.4 (4.34)	7.7 (5.65)	7.7 (5.45)
Post	.86	5.2^a (4.84)	5.2^a (3.99)	7.5 (5.48)	6.0^a (4.90)
Follow-up	.87	4.5^a (4.45)	4.7^a (3.54)	6.7 (5.29)	5.4^a (4.57)
BDS					
Pre	.93	33.9 (11.14)	31.8 (11.42)	31.7 (12.29)	32.4 (11.57)
Post	.94	25.6^a (9.14)	25.1^a (10.01)	28.2^a (11.78)	26.3^a (10.42)
Follow-up	.92	23.1^a (7.75)	24.3^a (8.24)	25.2^{a,d} (8.63)	24.3^{a,d} (8.19)
DERS					
Pre	.96	71.1 (25.99)	74.6 (23.33)	65.5 (21.11)	70.3 (24.12)
Post	.96	61.9^a (24.71)	64.3^a (18.82)	62.7 (20.55)	63.0^a (21.14)
Follow-up	.96	58.7^a (22.37)	65.1^b (21.10)	62.5 (18.10)	62.2^a (20.40)
ARS					
Pre	.95	35.7 (13.27)	37.1 (12.23)	33.4 (12.10)	35.3 (12.46)
Post	.96	29.6^a (10.59)	28.9^a (10.88)	31.2^a (11.24)	29.9^a (10.84)
Follow-up	.95	25.4^{a,c} (9.64)	28.2^a (9.63)	27.2^a (8.53)	27.2^{a,c} (9.22)
PANAS					
Pre	.92	32.8 (8.75)	32.4 (9.87)	32.1 (9.61)	32.4 (9.35)
Post	.94	34.4 (9.57)	34.7 (8.85)	32.1 (8.67)	33.7 (9.00)
Follow-up	.95	36.9^{a,d} (10.71)	34.8 (8.16)	34.3 (9.85)	35.3^{a,d} (9.56)
PTGI					
Pre	.92	34.7 (13.91)	35.7 (11.31)	33.9 (12.45)	34.8 (12.43)
Post	.95	37.3 (14.55)	39.6 (13.36)	34.8 (12.13)	37.2^b (13.32)
Follow-up	.96	37.3 (14.98)	33.4^c (13.76)	35.3 (13.68)	35.3^d (14.04)
Rye					
Pre	.87	50.4 (10.67)	52.8 (10.15)	52.0 (11.09)	51.8 (10.57)
Post	.87	55.3^a (10.20)	55.0 (9.75)	52.8 (10.44)	54.3^a (10.09)
Follow-up	.83	59.0^a (10.02)	56.0 (8.93)	55.0^b (8.11)	56.5^{a,d} (9.05)

^a $p \leq .01$; significantly different from Pre

^b $p \leq .05$; significantly different from Pre

^c $p \leq .01$; significantly different from Post

^d $p \leq .05$; significantly different from Post

** $p \leq .01$; significant difference between MG and RG/CG

Note: MG = mindfulness group; RG = relaxation group; CG = control group; DSES = Daily Spiritual Experiences Scale; ECR-R = Experiences in Close Relationships – Revised Questionnaire; FFMQ = Five Facet Mindfulness Questionnaire; PHQ = Patient Health Questionnaire Depression Scale; BDS = Breakup Distress Scale; DERS = Difficulties in Emotion Regulation Scale; ARS = Anger Rumination Scale; PANAS = Positive and Negative Affect Schedule (positive scale only); PTGI = Post-Traumatic Growth Inventory (short form); Rye = Rye Forgiveness Scale

Table 3

Bivariate Correlations of Participant Demographics with Outcome Measures

	PHQ	BDS	DERS	ARS	PANAS	PTGI	Rye
Age	-.06	.09	-.15	.03	-.08	-.04	-.11
Gender	.17	.16	.27**	.27**	-.14	.07	-.16
Year	-.06	-.07	.06	-.05	-.06	.13	.13
Race	-.14	-.06	-.17	.03	.36**	.25*	.08
Sexual Orientation	.24*	-.12	.07	-.10	-.13	-.20	.16
Global Religiousness	-.27*	-.22*	-.14	-.22*	.41**	.33**	.29**
Spirituality	-.05	.03	-.07	.05	.09	.29**	.03
Time Since Breakup	-.05	-.26*	.04	-.26*	.07	.17	.36**
Relationship Length	-.04	.02	-.04	-.01	-.06	-.06	.04
Initiator of Breakup	.15	.24*	.02	.10	-.12	-.02	-.30**
Cause of Problems	-.19	.03	-.13	.20	.16	.20	-.17
Previous Breakups	.19	.01	.06	.02	-.01	.08	.01
See Partner	.17	.11	.19	.08	-.03	-.16	-.04
Relationship Status	-.08	-.29**	.09	-.19	.08	.09	.20
Breakup Sudden	.19	.32**	.04	.18	-.19	-.05	-.29**
Relationship Not Good	-.12	-.09	-.03	.08	.10	.20	-.07
Gave fully	.12	.38**	.06	.36**	-.17	-.06	-.35**
Breakup Distress	.40**	.68**	.25*	.53**	-.33**	-.08	-.50**
Current Distress	.37**	.69**	.26*	.49**	-.34**	-.14	-.47**

* $p \leq .05$ ** $p \leq .01$

Table 4

Main Effects and Interactions for Mixed Between-Within Repeated Measures ANCOVAs by Treatment Condition for Psychological Outcomes

	Condition Main Effects	Time Main Effects	Interaction
Negative Outcomes			
PHQ	$F(2, 83) = 0.39$ $p = .681$	$F(1.88, 78.14) = 7.26$ $p = .001$ Pre < Post, FU	$F(3.77, 156.28) = 2.24$ $p = .071$
BDS	$F(2, 83) = 0.02$ $p = .987$	$F(1.87, 77.69) = 16.93$ $p < .001$ Pre < Post, FU	$F(3.74, 155.38) = 1.79$ $p = .137$
DERS	$F(2, 83) = 0.80$ $p = .453$	$F(1.97, 81.62) = 1.76$ $p = .176$	$F(3.83, 163.25) = 1.12$ $p = .351$
ARS	$F(2, 83) = 0.28$ $p = .757$	$F(1.93, 80.21) = 10.51$ $p < .001$ Pre < Post, FU	$F(3.36, 160.42) = 1.51$ $p = .012$
Positive Outcomes			
PANAS	$F(2, 82) = 0.29$ $p = .747$	$F(2, 82) = 4.44$ $p < .013$ Pre < FU	$F(4, 164) = 0.98$ $p = .419$
PTGI	$F(2, 83) = 0.03$ $p = .967$	$F(1.83, 75.94) = 0.07$ $p = .916$	$F(3.66, 151.88) = 1.78$ $p = .141$
Rye	$F(2, 83) = 0.04$ $p = .959$	$F(1.77, 83.38) = 4.19$ $p = .021$ Pre < Post, FU	$F(3.54, 146.76) = 0.14$ $p = .144$

Note: Global religiousness controlled for in all analyses

Table 5

Main Effects and Interactions for Mixed Between-Within Repeated Measures ANCOVAs by Treatment Condition for Spirituality

	Condition Main Effects	Time Main Effects	Interaction
DSES	$F(2, 83) = 0.03$ $p = .968$	$F(1.94, 161.24) = .115$ $p = .886$	$F(3.89, 161.24) = 2.38$ $p = .056$

Note: Global religiousness controlled

Table 6

Hierarchical Regression of the Relationship Between Baseline Mindfulness and Change in Psychological Outcomes

Outcome Variables												
Model	Depression				Breakup Distress				Difficulty Regulating Emotion			
	<i>R</i> ²	ΔR^2	<i>F</i>	<i>p</i>	<i>R</i> ²	ΔR^2	<i>F</i>	<i>p</i>	<i>R</i> ²	ΔR^2	<i>F</i>	<i>p</i>
1 ^a	.015	.015	1.291	.259	.040	.040	3.574	.062	.000	.000	.000	.987
2 ^b	.094	.079	7.333	.008	.091	.051	4.728	.032	.110	.110	10.365	.002

Outcome Variables												
Model	Anger Rumination				Positive Emotions				Post-Traumatic Growth			
	<i>R</i> ²	ΔR^2	<i>F</i>	<i>p</i>	<i>R</i> ²	ΔR^2	<i>F</i>	<i>p</i>	<i>R</i> ²	ΔR^2	<i>F</i>	<i>p</i>
1 ^a	.011	.011	.984	.324	.032	.032	2.801	.098	.000	.000	.021	.884
2 ^b	.062	.051	4.541	.036	.064	.032	2.802	.098	.019	.019	1.619	.207

Outcome Variables				
Model	Forgiveness			
	<i>R</i> ²	ΔR^2	<i>F</i>	<i>p</i>
1 ^a	.007	.007	.622	.433
2 ^b	.024	.017	1.465	.230

^a demographic control only (global religiousness)

^b demographic control + mindfulness

Table 7

Spirituality Change (T1 to T3) as Mediator of the Relationship between Mindfulness and Psychological Outcomes

Predictor Variable: Change in spirituality	Depression				Breakup Distress				Emotion Regulation			
	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs
a	-.14	.07	-2.03*		-.14	.07	-2.03*		-.14	.07	-2.03*	
b	.01	.04	.27		-.12	.08	-1.43		-.18	.19	-.97	
c	.08	.03	2.71**		.12	.05	2.17*		.39	.12	3.21**	
c'	.08	.03	2.69**		.10	.06	1.83		.36	.12	2.93**	
a ^x b	-.00	.00		(-.03, .01)	.02	.02		(-.01, .06)	.03	.03		(-.01, .12)
	Anger Rumination				Positive Emotion				Post-Traumatic Growth			
Path (see Figure 2)	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs
a	-.14	.07	-2.03*		-.14	.07	-2.03*		-.14	.07	-2.03*	
b	-.17	.10	-1.73		.17	.08	2.16*		.31	.10	3.06**	
c	.14	.06	2.13*		-.09	.05	-1.67		-.09	.07	-1.27	
c'	.11	.07	1.73		-.06	.05	-1.15		-.04	.07	-.64	
a ^x b	.02	.02		(.00, .08)	-.03	.02		(-.09, -.00)	-.04	.03		(-.12, -.00)
	Forgiveness											
Path (see Figure 2)	Estimate	SE	t	95% bias corrected, accelerated CIs								
a	-.14	.07	-2.03*									
b	.24	.10	2.42*									
c	-.08	.07	-1.21									
c'	-.05	.07	-.69									
a ^x b	-.03	.02		(-.09, -.00)								

Note: Global religiousness controlled for in all analyses; *p < .05, ** p < .01, *** p < .001

Table 8

Spirituality as Moderator of the Relationship between Mindfulness and Psychological Outcomes

Spirituality x Condition x Time Interaction	<i>F</i>	<i>df</i>	<i>p</i>
Negative Outcomes			
PHQ	2.97	(1.66, 84.77)	.066
BDS	0.12	(1.64, 92.97)	.871
DERS	0.49	(1.98, 100.97)	.611
ARS	0.17	(1.81, 92.51)	.821
Positive Outcomes			
PANAS	0.41	(2, 100)	.667
PTGI	0.40	(1.88, 95.85)	.658
Rye	1.25	(1.90, 97.13)	.291

Note: Global religiousness controlled for in all analyses

Table 9

Hierarchical Regression of the Relationship Between Baseline Attachment and Mindfulness, Spirituality

Mindfulness Measure												
Model	Mindfulness Total				Observing				Describing			
	R ²	ΔR ²	F	p	R ²	ΔR ²	F	p	R ²	ΔR ²	F	p
1 ^a	.001	.001	.099	.754	.006	.006	1.051	.307	.002	.002	.284	.595
2 ^b	.259	.258	31.28	.000	.029	.024	2.712	.069	.138	.137	14.352	.000

Mindfulness Measure												
Model	Acting with Awareness				Non-judging				Non-reacting			
	R ²	ΔR ²	F	p	R ²	ΔR ²	F	p	R ²	ΔR ²	F	p
1 ^a	.001	.001	.189	.664	.000	.000	.000	.996	.001	.001	.214	.644
2 ^b	.140	.139	14.599	.000	.215	.215	24.546	.000	.051	.050	4.814	.009

Spirituality				
Model	Daily Spiritual Experiences			
	R ²	ΔR ²	F	p
1 ^a	.478	.478	164.991	.000
2 ^b	.498	.016	87.318	.000

^a demographic control only (global religiousness)

^b demographic control + attachment

Table 10

Hierarchical Regression of the Relationship Between Baseline Attachment and Psychological Outcomes

Outcome Variables												
Model	Depression				Breakup Distress				Difficulty Regulating Emotion			
	R^2	ΔR^2	F	p	R^2	ΔR^2	F	p	R^2	ΔR^2	F	p
1 ^a	.020	.020	3.651	.058	.001	.001	.116	.734	.000	.000	.076	.783
2 ^b	.184	.164	20.202	.000	.078	.077	7.540	.001	.230	.230	26.792	.000

Outcome Variables												
Model	Anger Rumination				Positive Emotions				Post-Traumatic Growth			
	R^2	ΔR^2	F	p	R^2	ΔR^2	F	p	R^2	ΔR^2	F	p
1 ^a	.006	.006	1.036	.310	.047	.047	8.908	.003	.046	.046	8.665	.004
2 ^b	.097	.091	9.577	.000	.132	.085	13.645	.000	.069	.023	6.617	.002

Outcome Variables				
Model	Forgiveness			
	R^2	ΔR^2	F	p
1 ^a	.040	.040	7.486	.007
2 ^b	.149	.109	15.684	.000

^a demographic control only (global religiousness)

^b demographic control + attachment

Table 11

Main Effects and Interactions for Mixed Between-Within Repeated Measures ANCOVAs by Attachment Style

	Attachment Main Effects	Time Main Effects	Interaction
Negative Outcomes			
PHQ	$F(3, 51) = 7.87$ $p < .001$ Anx, Anx-Avoid > Sec, Anx-Avoid > Avoid	$F(1.69, 86.35) = 5.04$ $p = .012$ Pre > Post, FU	$F(5.08, 86.35) = 2.71$ $p = .025$
BDS	$F(3, 51) = 3.37$ $p = .025$ NSD	$F(1.86, 95.08) = 12.74$ $p = <.001$ Pre > Post, FU	$F(5.59, 95.08) = 1.94$ $p = .086$
DERS	$F(3, 51) = 8.85$ $p < .001$ Sec, Anx, Avoid < Anx-Avoid	$F(1.98, 100.80) = .818$ $p = .443$	$F(5.93, 100.80) = 2.28$ $p = .043$
ARS	$F(3, 51) = 2.32$ $p = .086$	$F(1.85, 94.83) = 11.38$ $p < .001$ Pre > Post, FU	$F(5.58, 94.83) = 1.22$ $p = .304$
Positive Outcomes			
PANAS	$F(3, 50) = 2.65$ $p = .059$	$F(2, 100) = 2.82$ $p = .064$	$F(6, 100) = 3.34$ $p = .005$
PTGI	$F(3, 51) = .76$ $p = .525$	$F(1.92, 97.93) = .17$ $p = .835$	$F(5.76, 97.93) = 1.25$ $p = .289$
Rye	$F(3, 51) = 2.77$ $p = .051$	$F(2, 101.93) = 1.15$ $p = .321$	$F(6, 101.93) = 3.27$ $p = .006$

Note: Global religiousness controlled for in all analyses

Table 12

Attachment as Moderator of the Relationship between Mindfulness and Psychological Outcomes

Attachment x Condition x Time Interaction	<i>F</i>	<i>df</i>	<i>p</i>
Negative Outcomes			
PHQ	0.28	(5.52, 86.48)	.937
BDS	0.97	(5.94, 93.12)	.449
DERS	1.55	(5.90, 92.38)	.172
ARS	1.07	(5.69, 89.19)	.385
Positive Outcomes			
PANAS	0.80	(6, 92)	.573
PTGI	0.80	(6, 94)	.575
Rye	0.62	(6, 94)	.719

Note: Global religiousness controlled for in all analyses

Table 13

Spirituality Change (T1 to T3) as Mediator of the Relationship between Mindfulness and Psychological Outcomes, without Demographic Control

Predictor Variable: Change in spirituality	Depression				Breakup Distress				Emotion Regulation			
	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs
a	.14	.07	-1.98		.14	.07	1.98		.14	.07	1.98	
b	.01	.04	.33		-.11	.08	-1.30		-.18	.18	-1.00	
c	.08	.03	-2.83**		.13	.05	2.36*		.38	.12	3.21**	
c'	.08	.03	-2.82**		.11	.06	2.04*		.36	.12	2.93**	
a ^x b	-.00	.00		(-.02, .01)	.02	.01		(-.00, .06)	.03	.03		(-.01, .12)
	Anger Rumination				Positive Emotion				Post-Traumatic Growth			
Path (see Figure 2)	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs	Estimate	SE	t	95% bias corrected, accelerated CIs
a	-.14	.07	-1.98		-.15	.07	-2.17*		-.14	.07	-1.98	
b	-.16	.10	-1.68		.16	.08	2.02*		.31	.10	3.10**	
c	.14	.06	2.24*		-.10	.05	-1.85		-.08	.07	-1.25	
c'	.12	.06	1.86		-.07	.05	-1.36		-.04	.07	-.64	
a ^x b	.02	.02		(.00, .08)	-.02	.02		(-.08, .00)	-.04	.03		(-.12, -.00)
	Forgiveness											
Path (see Figure 2)	Estimate	SE	t	95% bias corrected, accelerated CIs								
a	-.14	.07	-1.98									
b	.23	.10	2.38*									
c	-.08	.06	-1.30									
c'	-.05	.06	-.80									
a ^x b	-.03	.02		(-.09, -.00)								

*p < .05, ** p < .01

Figure 1. Flow of Participants Through Each Stage of the Study

Recruitment

Allocation

Randomization

Study Completion

Data Analysis

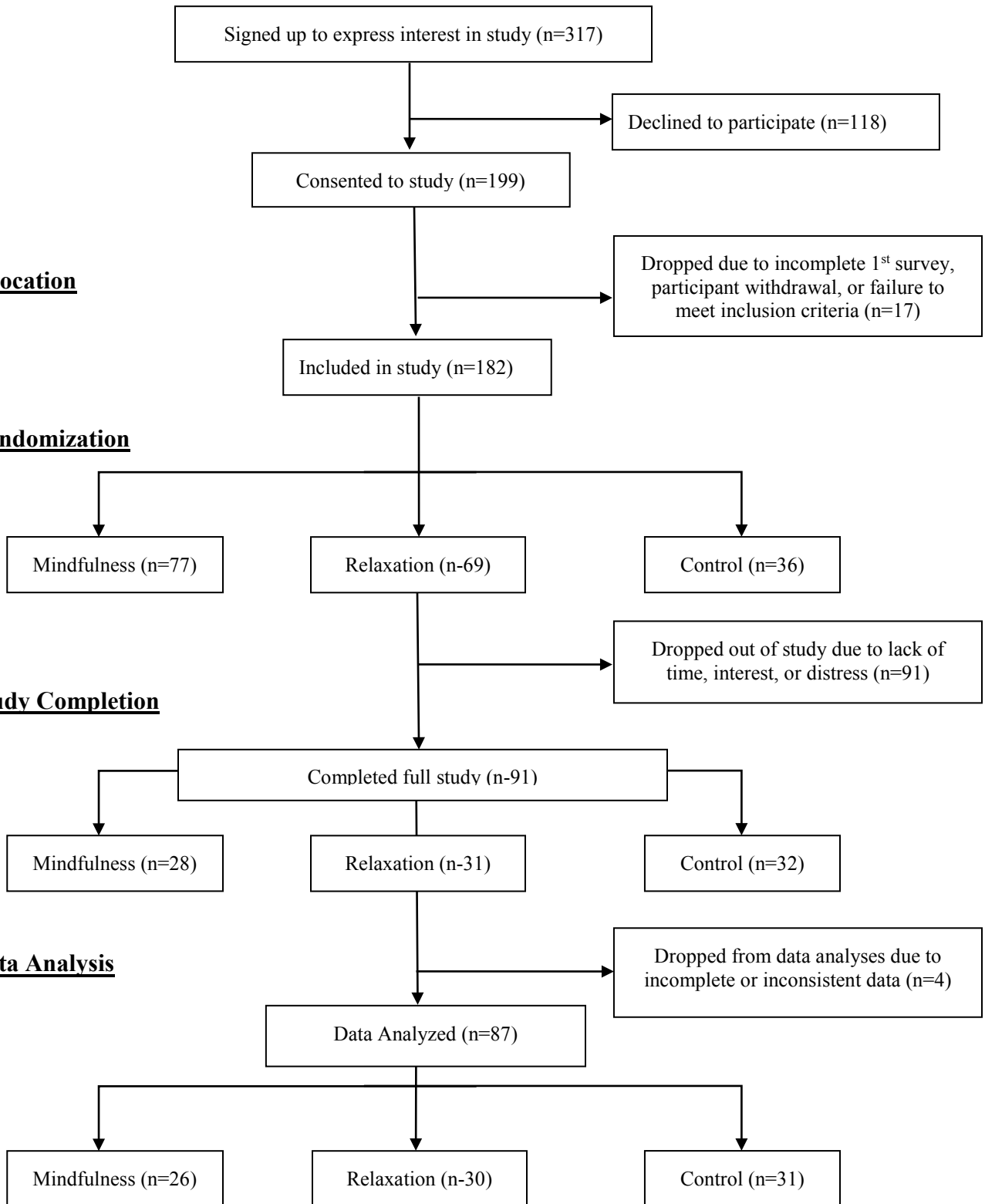


Figure 2. Change in Spirituality as a Mediator of Links Between Trait Mindfulness and Outcomes

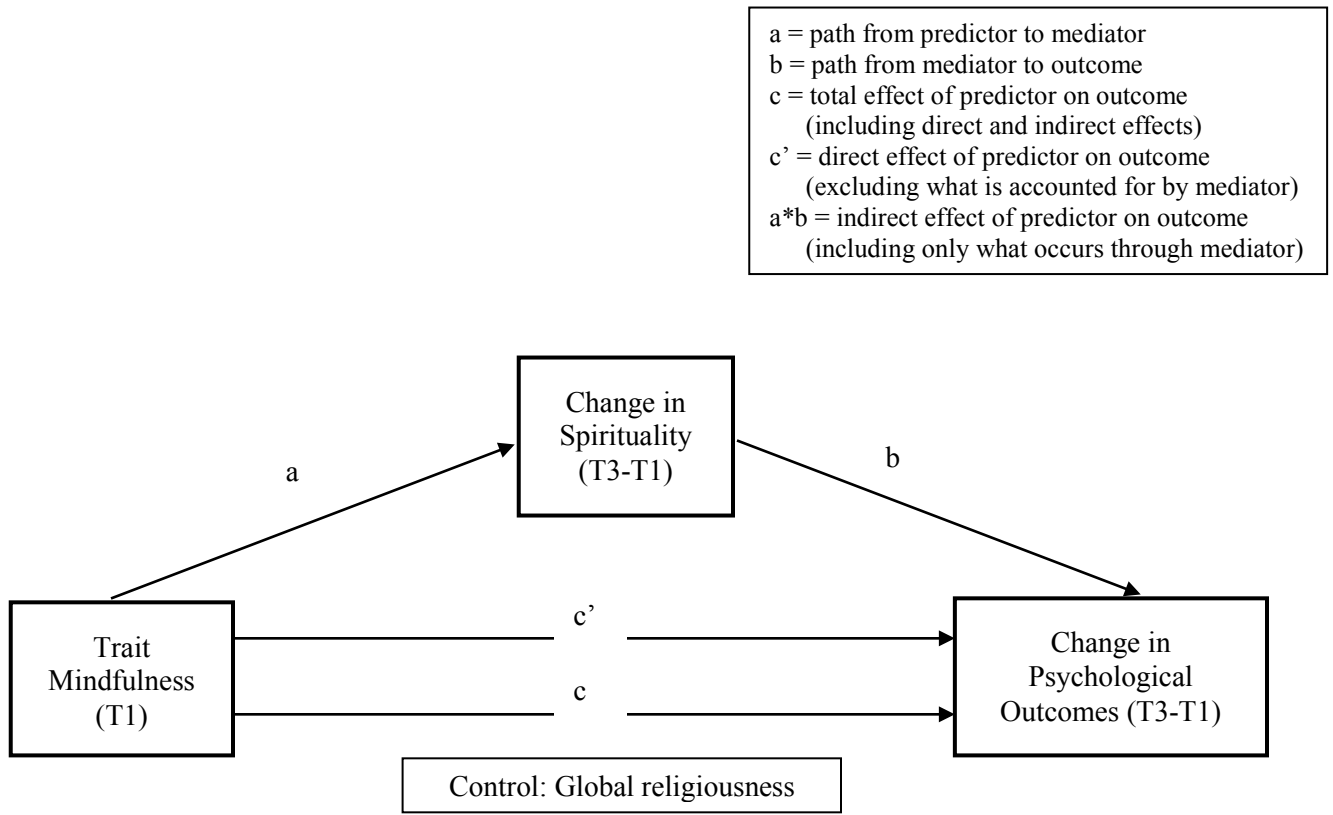


Figure 3. ARS Scores by Time and Condition

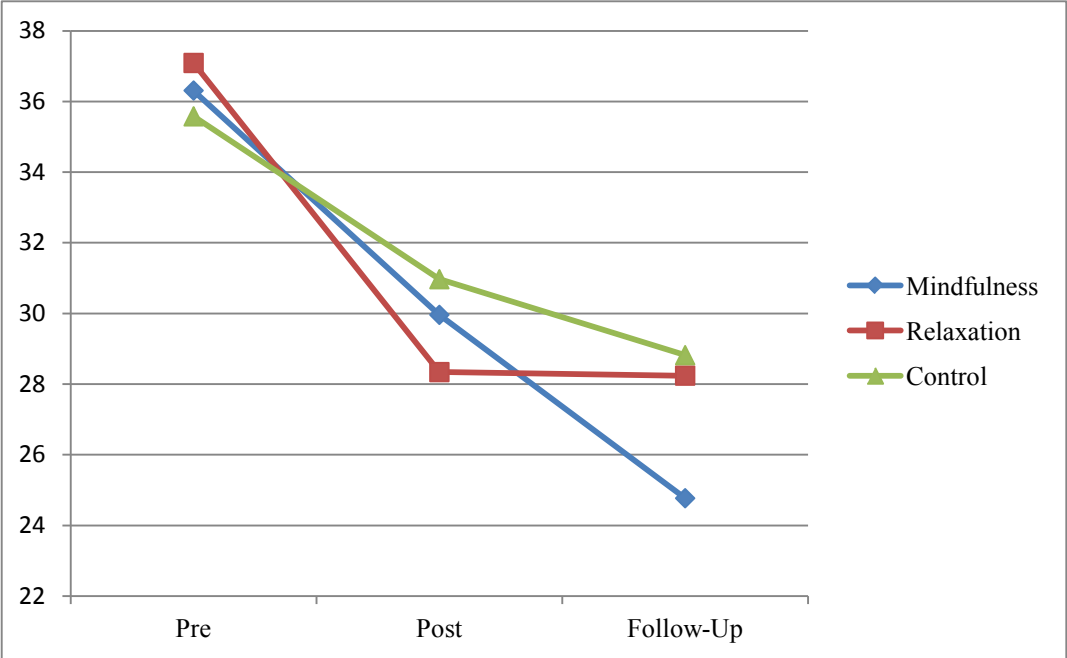


Figure 4. DSES Scores by Time and Condition

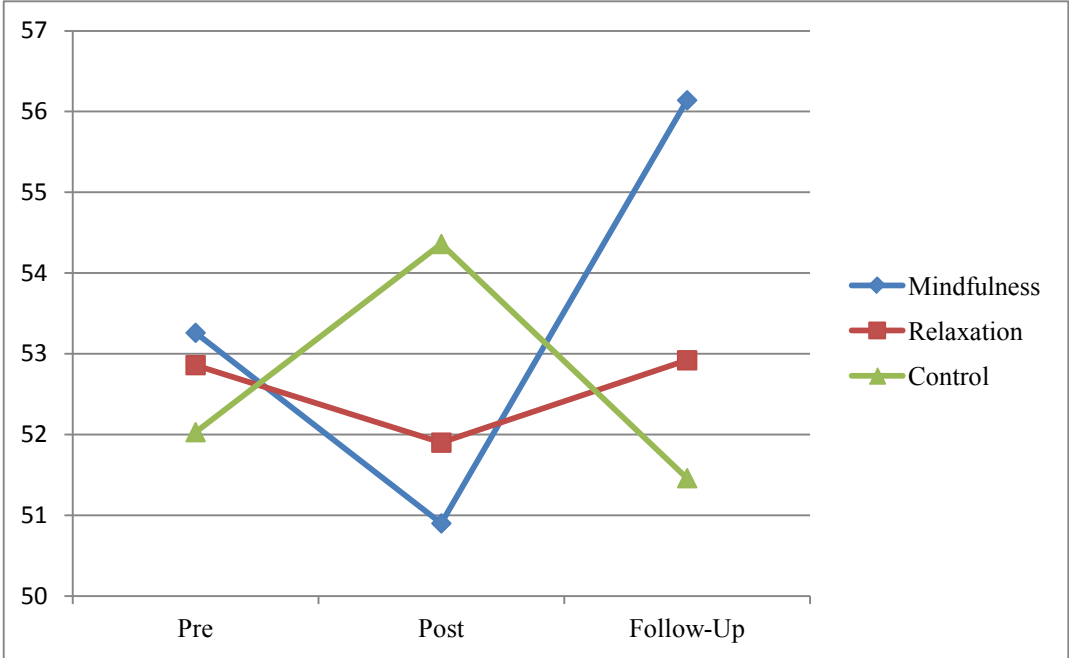


Figure 5. PHQ Scores by Time and Attachment Style

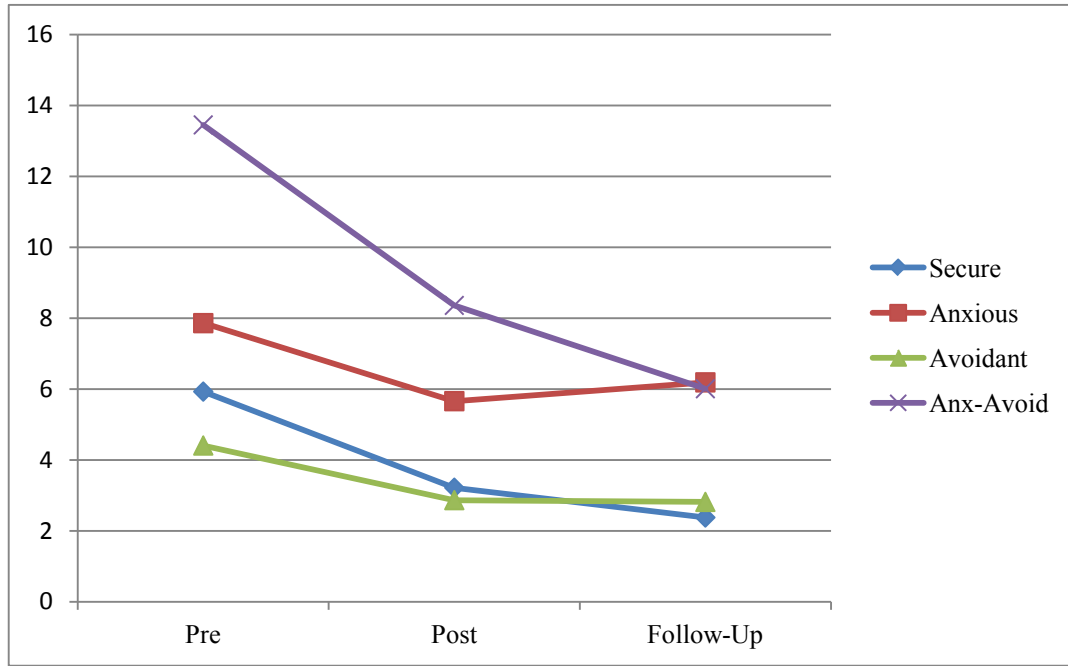


Figure 6. DERS Scores by Time and Attachment Style

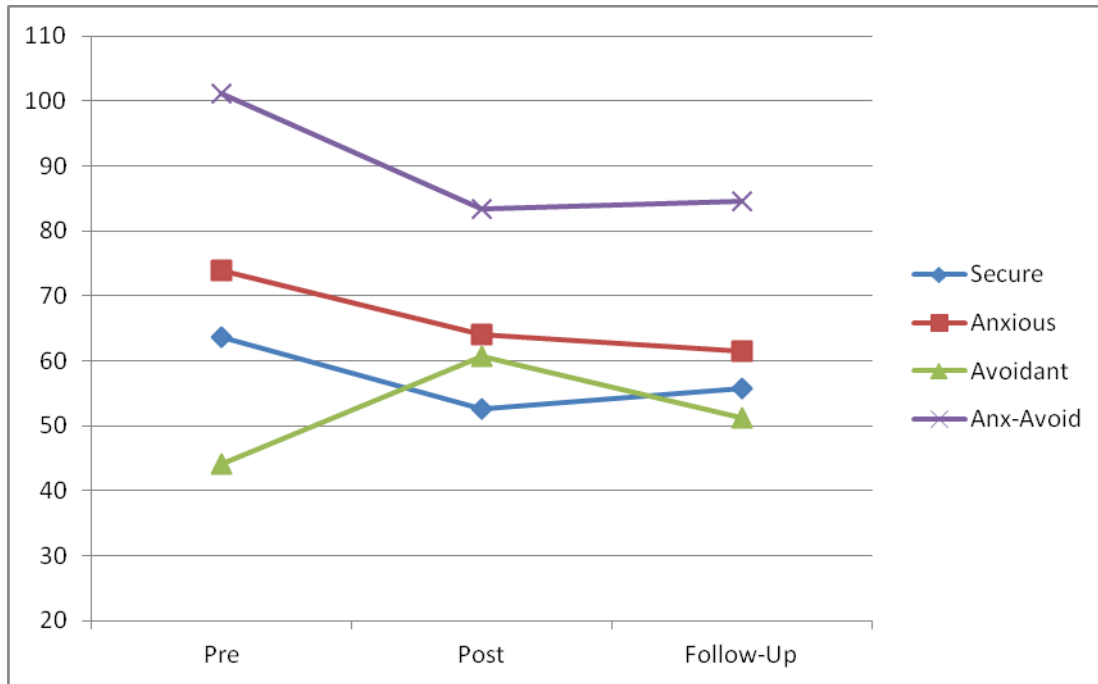


Figure 7. PANAS Scores by Time and Attachment Style

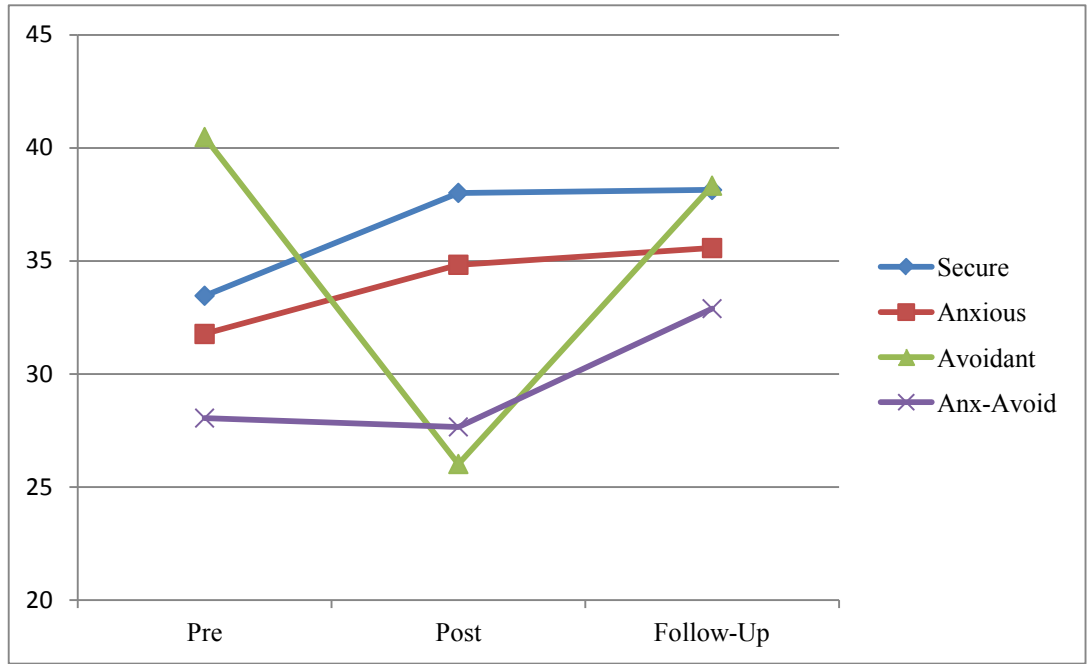
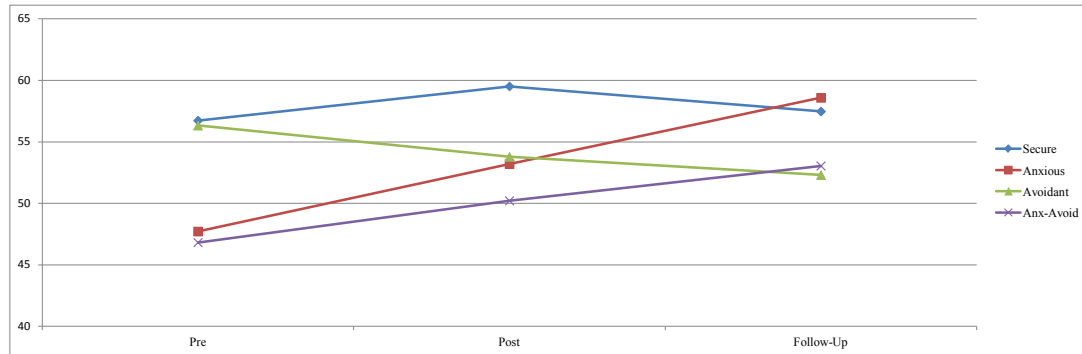


Figure 8. Rye Scores by Time and Attachment Style



APPENDIX A: RECRUITMENT MATERIALS

Recruitment Script

Hello. I am _____, and I am working with a research group in psychology here at BGSU. We are exploring the breakup process and need your help. If, in the last 12 months, you have experienced the breakup of a relationship that lasted at least 3 months and are still struggling with that breakup, please consider participating in our study.

If you choose to participate, we will ask you to listen to four online modules, one per week, each lasting between 20 and 40 minutes, and to practice the skills you learn for about 20 minutes a day five days a week in between the modules. We will also ask you to complete an online log of your daily practice and to complete research questionnaires before, during and after the study – 3 times total. The questionnaires consist of various questions about you and how you think and feel. Each one will take approximately 30-40 minutes to complete. Your overall time commitment to participate in the full study if you are assigned to one of the intervention groups will be less than 10 hours.

This is a randomized controlled trial, which means that you will be randomly assigned to one of two treatment conditions OR a control group. If you are assigned to the control group, you will not participate in either of the interventions. Your only requirement for participation in the study will be to fill out the three sets of study questionnaires. This will take a total of 2 hours. Regardless of the group you are assigned to, the study will take place over eight weeks.

Because this study asks for quite a bit of your time if you are in one of the intervention groups, your professor has offered: [fill in details for their specific class/professor how this will fulfill research requirement and/or offer extra credit points]. If you choose not to participate in this study, you may complete a different but equivalent assignment to earn partial course credit. If you are assigned to the control condition, you will receive less credit [details specific to their class/professor], but you can complete part of the equivalent assignment in order to earn the same amount of credit as if you were in one of the intervention groups.

Participation in this research is not required, is voluntary, and after the research project has begun you are allowed to change your mind and refuse to participate further without penalty. The study is available only to those who are at least 18 years old and who have experienced within the last 12 months the breakup of a relationship lasting at least 3 months and are still struggling. As mentioned, your professor will offer an alternate assignment if you want to earn credit but do not want to participate in this research study or are not eligible.

I am passing around a sign-up sheet. Please sign it if you are interested and meet the criteria. Give us your contact information so that we can send you the first assessment internet link and further details about the research study.

Do you have any questions?

Thank you for being willing to help us out!

APPENDIX B: SCREENING/PRE-INTERVENTION MATERIALS

Demographic Questions

Please tell us a little bit about yourself. This will help us understand the relationship between personal characteristics and how individuals deal with the stresses of a break-up.

- 1) How old are you? _____ years
- 2) What is your gender? _____ Male _____ Female _____ Transgender
- 3) What is your current year in college? _____ Freshman _____ Sophomore _____ Junior _____ Senior _____ Other (specify)
- 4) How would you describe your racial/ethnic identity?

_____ White/Caucasian	_____ Asian	_____ Black/African American
_____ Native American	_____ Hispanic	_____ Middle Eastern
_____ Pacific Islander	_____ Multi-Racial/Other (specify)	
- 5) What is your sexual orientation?

_____ Heterosexual/straight	_____ Lesbian/gay	_____ Bisexual
_____ Questioning	_____ Asexual	_____ Other
- 6) How long, in months, has it been since your most recent breakup? _____ month(s)
- 7) Prior to this breakup, how long, in months, did your relationship last? _____ month(s)
- 8) Who initiated the breakup?

1	2	3	4	5	6	7
I did			Mutual			Partner did
- 9) Who contributed to the problems leading up to the breakup?

1	2	3	4	5	6	7
I did			Mutual			Partner did
- 10) How much do you agree with the following statement: “The breakup was sudden and unexpected.”

 ___ Strongly disagree ___ Disagree ___ Neutral ___ Agree ___ Strongly agree
- 11) How much do you agree with the following statement: “I felt rejected by the breakup.”

 ___ Strongly disagree ___ Disagree ___ Neutral ___ Agree ___ Strongly agree
- 12) How much do you agree with the following statement: “I felt betrayed by the breakup.”

 ___ Strongly disagree ___ Disagree ___ Neutral ___ Agree ___ Strongly agree

13. How much do you agree with the following statement: "At the time of the breakup, I was heartbroken over the breakup."
 Strongly disagree Disagree Neutral Agree Strongly agree
14. How much do you agree with the following statement: "I am still (currently) heartbroken over the breakup."
 Strongly disagree Disagree Neutral Agree Strongly agree
- 15) Have you experienced previous breakups?
 This was my first breakup I have had one previous breakup
 I have had 2-5 previous breakups I have had > 5 previous breakups
- 16) Which of the following best estimates how often you see your previous partner?
 Never Rarely/Less than once a month
 1-2x per month Once or twice a week At least once a day
- 17) What is your current relationship status?
 Not in a relationship In a relationship (with ex)
 In a relationship (not with ex)
- 18) Do you ever feel so distressed by the breakup, or for any other reason, that you seriously consider killing yourself, or otherwise causing significant bodily self-harm?
 Yes No
- 19) Do you ever feel so distressed by the breakup, or for any other reason, that you seriously consider killing your ex-partner or someone else, or otherwise causing them significant bodily harm?
 Yes No
- 20) How would you describe your religious/spiritual beliefs?
 Christian (Protestant) Christian (Catholic) Muslim
 Christian (other, specify) Buddhist Hindu
 Atheist/Agnostic Other (specify) None
- 21) Which of the following best estimates how often you attend religious services?
 at least once daily several times weekly once weekly
 several times monthly once monthly several times a year
 less than once a year never
- 22) How religious do you consider yourself to be?
 not at all religious a little religious moderately religious
 quite religious extremely religious
- 23) How spiritual do you consider yourself to be?
 not at all spiritual a little spiritual moderately spiritual
 quite spiritual extremely spiritual

- 24) To link your responses at each time point, please create your unique Study ID consisting of the following: the last three digits of your telephone number, the last two letters of your first name, and the two digit month of your birth. For instance John, who was born in March, and whose phone number is 419-123-4567 would create his Study ID as: 567hn03. You will be asked to enter this number each time you fill out questionnaires or record your daily practice.

Last 3 digits of phone # _____ Last 2 letters of first name _____ 2 digit birth month _____

**Patient Health Questionnaire Depression Scale
(PHQ-9; Kroenke, Spitzer, & Williams, 2001)**

Over the *last 2 weeks*, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
Little interest or pleasure in doing things	0	1	2	3
Feeling down, depressed, or hopeless	0	1	2	3
Trouble falling or staying asleep, or sleeping too much	0	1	2	3
Feeling tired or having little energy	0	1	2	3
Poor appetite or overeating	0	1	2	3
Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
Moving or speaking so slowly that other people have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual				
Thoughts you would be better off dead or of hurting yourself in some way				
	Not at all difficult	Somewhat difficult	Very difficult	Extremely difficult
If you checked off <i>any</i> problems above, how <i>difficult</i> have these problems made it for you to do your work, take care of things at home, or get along with other people				

Anger Rumination Scale
(ARS; Sukhodolsky, Golumb, & Cromwel, 2001)

Rate each of the following items in terms of how well it corresponds to your beliefs about yourself, *specifically with regard to the breakup and your ex-partner*. Please use the following scale:

1 = Almost never 2 = Sometimes 3 = Frequently 4 = Almost Always

- I reenact past anger episodes related to my ex/the breakup in my mind.
- When thinking about things my ex did to make me angry, I turn them over and over again in my mind.
- Memories of even minor annoyances continue to bother me.
- Whenever I experience anger, I keep thinking about it for awhile.
- I keep fighting with my ex in my imagination.
- Memories of being aggravated pop up into my mind before I fall asleep.
- I have long-living fantasies of revenge.
- I can't stop thinking about how to get back at my ex.
- I have day dreams and fantasies of a violent nature.
- I have difficulty forgiving my ex.
- I ponder about the injustices my ex has done to me.
- I keep thinking about events that angered me for a long time.
- I feel angry about certain things my ex did.
- I ruminate about past anger experiences related to my ex/the breakup.
- Events related to my ex and the breakup still make me angry.
- I think about the reasons my ex treated me badly.
- I keep wondering why this should have happened to me.
- I analyze events with my ex that make me angry.
- I have had times when I could not stop being preoccupied with particular conflicts.

Breakup Distress Scale (BDS; Field, Diego, Pelaez, Deeds, & Delgado, 2009)

How much have you experienced each of the following over the past 7 days?

1=Not at all

2=A little

3=Moderately

4=Very much so

1. I think about this person so much that it's hard for me to do the things I normally do
2. Memories of the person upset me
3. I feel I cannot accept the breakup I've experienced
4. I fell myself longing for the person
5. I feel drawn to places and things associated with the person
6. I can't help feeling angry about the breakup
7. I feel disbelief over what happened
8. I feel stunned or dazed over what happened
9. Ever since the breakup, it is hard for me to trust people
10. Ever since the breakup, I feel as if I have lost the ability to care about other people or I feel distant from people I care about
11. I feel lonely a great deal of the time ever since the breakup
12. I have been experiencing pain since the breakup
13. I go out of my way to avoid reminders of the person
14. I feel that life is empty without the person
15. I feel bitter over this breakup
16. I feel envious of others who have not experienced a breakup like this

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988)
Positive Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past week. Use the following scale to record your answers.

Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1	2	3	4	5

- interested
- alert
- excited
- inspired
- strong
- determined
- attentive
- enthusiastic
- active
- proud

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)*

	Almost Never (0-10%)	Sometimes (11-35%)	About Half the Time (36-65%)	Most of the Time (66-90%)	Almost Always (91-100%)
I am clear about my feelings [^]					
2					
I pay attention to how I feel [^] [ELIMINATED]					
I experience my emotions as overwhelming and out of control					
I have no idea how I am feeling					
I have difficulty making sense out of my feelings					
I am attentive to my feelings [^] [ELIMINATED]					
I know exactly how I am feeling [^]					
I care about what I am feelings [^] [ELIMINATED]					
I am confused about how I feel.					
11					
When I'm upset, I acknowledge my emotions [^] [ELIMINATED]					
13					
When I'm upset, I become angry with myself for feeling that way.					
When I'm upset, I become embarrassed for feeling that way.					
When I'm upset, I have difficulty getting work done.					
When I'm upset, I become out of control.					
18					
When I'm upset, I believe that I will remain that way for a long time.					
When I'm upset, I believe that I'll end up feeling depressed.					
When I'm upset, I believe that my feelings are valid and important [^] [ELIMINATED]					
When I'm upset, I have difficulty focusing on other things.					
When I'm upset, I feel out of control.					
When I'm upset, I can still get things done. [^]					

When I'm upset, I feel ashamed with myself for feeling that way.					
When I'm upset, I know that I can find a way to eventually feel better. ^					
When I'm upset, I feel like I am weak.					
When I'm upset, I feel like I can remain in control of my behaviors.^					
When I'm upset, I feel guilty for feeling that way.					
When I'm upset, I have difficulty concentrating.					
When I'm upset, I have difficulty controlling my behaviors.					
When I'm upset, I believe there is nothing I can do to make myself feel better					
When I'm upset, I become irritated with myself for feeling that way.					
When I'm upset, I start to feel very bad about myself.					
When I'm upset, I believe that wallowing in it is all I can do.					
36					
When I'm upset, I lose control over my behaviors.					
When I'm upset, I have difficulty thinking about anything else.					
When I'm upset, I take time to figure out what I'm really feeling^ [ELIMINATED]					
When I'm upset, it takes me a long time to feel better.					
When I'm upset, my emotions feel overwhelming.					

*Awareness items eliminated

^reverse scored item

Rye Forgiveness Scale
(Rye et al., 2002)

Think of how you have responded to your ex-partner, who you may feel has wronged or mistreated you. Indicate the degree to which you agree or disagree with the following statements. Please use the following scale:

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

1. I can't stop thinking about how I was wronged by my ex.
2. I wish for good things to happen to my ex.
3. I spend time thinking about ways to get back at my ex.
4. I feel resentful toward my ex.
5. I avoid certain people and/or places because they remind me of my ex.
6. I pray for my ex.
7. If I encountered my ex, I would feel at peace.
8. This person has kept me from enjoying life.
9. I have been able to let go of my anger toward my ex.
10. I become depressed when I think of how I was mistreated by my ex.
11. I think that many of the emotional wounds related to my ex have healed.
12. I feel hatred whenever I think about my ex.
13. I have compassion for my ex.
14. I think my life is ruined because of my ex.
15. I hope my ex is treated fairly by others in the future.

**Post-Traumatic Growth Inventory – Short Form
(PTGI-SF; Cann, 2010)**

For each statement below, indicate the degree to which each is true regarding change you may have experienced in your life as a result of your breakup. Please use the following scale:

0=No change at all 1=Very small degree of change 2=Small degree of change 3=Moderate degree of change 4=A great degree of change 5=Very great degree of change

- 1) I changed my priorities about what is important in life
- 2) I have a greater appreciation for the value of my own life
- 3) I am able to do better things with my life
- 4) I have a better understanding of spiritual matters
- 5) I have a greater sense of closeness with others
- 6) I have established a new path for my life
- 7) I know better that I can handle difficulties
- 8) I have a stronger religious faith
- 9) I discovered that I'm stronger than I thought I was
- 10) I learned a great deal about how wonderful people are

**Five Facet Mindfulness Questionnaire
(FFMQ: Baer, Smith, Hopkins Krietemeyer, & Toney, 2006)**

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

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

1. When I'm walking, I deliberately notice the sensations of my body moving.
2. I'm good at finding words to describe my feelings.
3. I criticize myself for having irrational or inappropriate emotions.
4. I perceive my feelings and emotions without having to react to them.
5. When I do things, my mind wanders off and I'm easily distracted.
6. When I take a shower or bath, I stay alert to the sensations of water on my body.
7. I can easily put my beliefs, opinions, and expectations into words.
8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
9. I watch my feelings without getting lost in them.
10. I tell myself I shouldn't be feeling the way I'm feeling.
11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
12. It's hard for me to find the words to describe what I'm thinking.
13. I am easily distracted.
14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
15. I pay attention to sensations, such as the wind in my hair or sun on my face.
16. I have trouble thinking of the right words to express how I feel about things
17. I make judgments about whether my thoughts are good or bad.
18. I find it difficult to stay focused on what's happening in the present.
19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
21. In difficult situations, I can pause without immediately reacting.
22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
23. It seems I am "running on automatic" without much awareness of what I'm doing.
24. When I have distressing thoughts or images, I feel calm soon after.
25. I tell myself that I shouldn't be thinking the way I'm thinking.
26. I notice the smells and aromas of things.
27. Even when I'm feeling terribly upset, I can find a way to put it into words.
28. I rush through activities without being really attentive to them.
29. When I have distressing thoughts or images I am able just to notice them without reacting.
30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
32. My natural tendency is to put my experiences into words.

33. When I have distressing thoughts or images, I just notice them and let them go.
34. I do jobs or tasks automatically without being aware of what I'm doing.
35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
36. I pay attention to how my emotions affect my thoughts and behavior.
37. I can usually describe how I feel at the moment in considerable detail.
38. I find myself doing things without paying attention.
39. I disapprove of myself when I have irrational ideas.

Daily Spiritual Experience Scale (DSES: Underwood & Teresi, 2002)

The list that follows includes items you may or may not experience. Please consider how often you directly have this experience, and try to disregard whether you feel you should or should not have these experiences. A number of items use the word ‘God.’ If this word is not a comfortable one for you, please substitute another word that calls to mind the divine or holy for you.

	Never	Once in a while	Some days	Most days	Every day	Many times a day
I feel God’s presence.						
I experience a connection to all of life						
During worship, or at other times when connecting with God, I feel joy which lifts me out of my daily concerns.						
I find strength in my religion or spirituality.						
I find comfort in my religion or spirituality.						
I feel deep inner peace or harmony.						
I ask for God’s help in the midst of daily activities.						
I feel guided by God in the midst of daily activities.						
I feel God’s love for me, directly.						
I feel God’s love for me, through others.						
I am spiritually touched by the beauty of creation						
I feel thankful for my blessings.						
I feel a selfless caring for others.						
I accept others even when they do things I think are wrong.						
I desire to be closer to God or in union with the divine.						
	Not at all	Somewhat close	Very close	As close as possible		
In general, how close do you feel to God?						

**Experiences in Close Relationships – Revised
(ECR-R; Fraley, Waller, & Brennan, 2000)**

Instructions: The statements below concern how you feel in emotionally intimate relationships. We are interested in how you *generally* experience relationships, not just in what is happening in your current or last relationship. Respond to each statement by selecting the number that indicates how much you agree or disagree with the statement.

Disagree strongly			Neutral/mixed			Agree strongly
1	2	3	4	5	6	7

1. I'm afraid that I will lose my partner's love.
2. I often worry that my partner will not want to stay with me.
3. I often worry that my partner doesn't really love me.
4. I worry that romantic partners won't care about me as much as I care about them.
5. I often wish that my partner's feelings for me were as strong as my feelings for him or her.
6. I worry a lot about my relationships.
7. When my partner is out of sight, I worry that he or she might become interested in someone else.
8. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.
9. ^I rarely worry about my partner leaving me.
10. My romantic partner makes me doubt myself.
11. ^I do not often worry about being abandoned.
12. I find that my partner(s) don't want to get as close as I would like.
13. Sometimes romantic partners change their feelings about me for no apparent reason.
14. My desire to be very close sometimes scares people away.
15. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.
16. It makes me mad that I don't get the affection and support I need from my partner.
17. I worry that I won't measure up to other people.
18. My partner only seems to notice me when I'm angry.
19. I prefer not to show a partner how I feel deep down.
20. ^I feel comfortable sharing my private thoughts and feelings with my partner.
21. I find it difficult to allow myself to depend on romantic partners.
22. ^I am very comfortable being close to romantic partners.
23. I don't feel comfortable opening up to romantic partners.
24. I prefer not to be too close to romantic partners.
25. I get uncomfortable when a romantic partner wants to be very close.
26. ^I find it relatively easy to get close to my partner.
27. ^It's not difficult for me to get close to my partner.
28. ^I usually discuss my problems and concerns with my partner.
29. ^It helps to turn to my romantic partner in times of need.
30. ^I tell my partner just about everything.
31. ^I talk things over with my partner.

32. I am nervous when partners get too close to me.
33. ^I feel comfortable depending on romantic partners.
34. ^I find it easy to depend on romantic partners.
35. ^It's easy for me to be affectionate with my partner.
36. ^My partner really understands me and my needs.

Items should be randomized!

^reverse scored

For information on scoring, see:

<http://internal.psychology.illinois.edu/~rcfraley/measures/ecrr.htm>,

<http://internal.psychology.illinois.edu/~rcfraley/measures/ecrritems.htm>

APPENDIX C: INFORMED CONSENT

*Bowling Green State University Psychology Department
Breakup Intervention Online Informed Consent*

Introduction: My name is Melissa Falb and I am a graduate student in the Psychology Department at Bowling Green State University. I am currently studying the experiences of individuals who have recently gone through a relationship breakup and are experiencing some distress because of that.

Purpose: This study is a psychological research study of the breakup process. I hope that by observing changes in your thoughts and feelings over time and, in some cases, having you learn a set of psychological skills, I can learn more about the changes individuals experience after a breakup. I also hope you will experience fewer difficulties and distress as a result of your recent breakup if you participate in one of the interventions.

Procedure: This study is a randomized controlled trial. This means that you will be randomly assigned to one of two treatment conditions OR to a control group, where you do not participate in either of the interventions. However, if you are assigned to the control group, you will participate in other parts of the study, such as filling out several sets of questionnaires about your thoughts and feelings. A randomized controlled trial helps researchers understand how different interventions compare with each other and with no intervention at all. The interventions have been studied and found to be beneficial for many different types of individuals, but never with people going through a breakup. There is some evidence that the interventions will also be helpful for breakup distress. If you are assigned to the control group and would like to learn one of the interventions, you can do so after the study is over (approximately 8 weeks).

If you are assigned to one of the intervention groups, your participation in this study will involve several components. One part of the study consists of your listening to four on-line modules (each approximately 20-40 minutes for a total of 2 hours). In the modules, you will learn a little about the normal effects of going through a breakup and then learn a set of psychological skills that may provide you with new ways of coping with and responding to your thoughts and feelings about your breakup. You will also be asked to practice the skills you learn in the modules for approximately 20 minutes a day for 5 days a week between sessions (an additional 6.5 hours total). In addition, as part of the study you will complete a set of research questionnaires at three time points - prior to starting the study, after the four modules, and at a follow-up point four weeks later (an additional 2 hours total). The questionnaires consist of many questions asking who you are (demographics) and how you think and feel. Finally, you will be asked to fill out an on-line record indicating how long you practiced each day – this should take only a minute per day, totaling less than 30 minutes. Your overall time commitment to

participate in the full study if you are assigned to one of the intervention groups will be approximately 11 hours.

If you are assigned to the control group, your participation in this study will involve completing a set of research questionnaires at three time points – at the start of the study, four weeks later, and again four weeks after that. The questionnaires consist of many questions asking who you are (demographics) and how you think and feel. Each one will each take approximately 40 minutes, for a total time commitment of 2 hours.

Per your professor's guidelines, and as discussed in class, you can earn partial course credit for your participation. If you choose not to participate in this study, you may complete a different but equivalent assignment to earn partial course credit. If you are assigned to the control condition, you will receive less credit, but you can complete part of the equivalent assignment in order to earn the same amount of credit as if you were in one of the intervention groups.

Risks of Participation: There may be some risks associated with this study. For instance, the time commitment involved in this study if you are assigned to one of the intervention groups may cause mild discomfort. However, you are free to leave the study at any point. If you enrolled in the study in order to receive class credit, you will be eligible to obtain credit through completion of an alternative assignment.

In addition, on rare occasions some people may experience unwanted thoughts, feelings, or memories as they think about their breakup. Should difficult experiences arise for you, please contact the study investigator Melissa Falb, an advanced clinical psychology graduate student who is under the supervision of a licensed psychologist, at mdfalb@bgsu.edu or 248-787-2999. Alternatively, you can schedule an appointment at the BGSU Psychological Services Center (419-372-2540) or at the BGSU Counseling Center (419-372-2081).

Finally, please note that there are limits to the security of public computers. If you access the study questionnaires from a public computer, be sure to clear the browser cache and page history after you have completed the assessments each time. If you access the study questionnaires from your workplace, note that there is a possibility that tracking software could be used by your employer.

Benefits of Participation: We anticipate that you may benefit from your participation in this study. Both of the interventions utilized in this study have been shown to have a number of benefits for many different kinds of people. For example, they can be helpful in dealing with struggles similar to those experienced by people going through a breakup. These may include physical, mental, spiritual, and/or interpersonal benefits. In addition, your participation may be of benefit to others as it can help the researchers better understand the process of going through a breakup.

Voluntary Nature: Your participation is completely voluntary. You are free to withdraw at any time. You may decide to skip questions (or not do a particular task) or discontinue participation at any time without penalty. Deciding to participate or not will not affect your academic standing or your relationship with Bowling Green State University.

Confidentiality Protection: All information collected as part of this research will remain confidential. The researchers will be able to link your data to your name only during the course of the study, using a system of code numbers matched to your name. At the end of the study, your name will be destroyed and will no longer be able to be connected with your data. Your individual data will never be shared. All data will be stored in a secure, password-protected file to which only the primary researchers have access.

Contact Information: If you have any concerns or questions about this research study or your participation in the research, please contact Melissa Falb (mdfalb@bgsu.edu; 248-787-2999), or the project advisor Dr. Ken Pargament (kpargam@bgsu.edu; 419-372-8037). You may also contact the Chair of the Human Subjects Review Board at Bowling Green State University (hsrb@bgsu.edu; 419-372-7716) if you have any questions about your rights as a participant in this research.

Eligibility: In order to take part in this research study, you must be at least 18 years old, have experienced a breakup in the past 6 months of a relationship lasting 3 months or longer, and be willing to participate in any of the three groups to which you are assigned. Clicking the next button to continue represents that you meet these criteria and wish to participate. Completing and submitting the survey also serves as your consent to participate in this study.

APPENDIX D: MINDFULNESS TRAINING PROGRAM

Session 1:

Introduction

It's normal to have a range of feelings after a breakup, many of them negative. You are likely feeling some combination of sadness, anger, loneliness, uncertainty, and guilt. Even if you were the one who initiated the breakup, or know that what happened is for the best, the end of a relationship can still be very painful. Someone who was once important to you has changed their role or is no longer in your life at all. Your hopes and dreams have been shaken or even crushed, and many of your other relationships may have been affected as well. You might be questioning who you are and what you want, why you made certain decisions, what qualities you want in a partner, perhaps if you ever want to have a relationship again in the future. You might be not be able to sleep, may have difficulty concentrating on your school work, or are perhaps eating more or less than usual. Your thoughts and feelings may be overwhelming at times and feel very intense and difficult to control. None of this is unusual after a breakup. Fortunately, there are some things you can do to help with these strong reactions and emotions about the breakup.

The purpose of this study is to provide you with some new ways of coping with and responding to your thoughts and feelings about your recent breakup. You have been assigned to the mindfulness training portion of the study. Mindfulness is a group of techniques that teaches people to notice and respond to their experiences without judgment. Previous research suggests that mindfulness may help with the struggles many people experience after a breakup. For example, mindfulness has been shown to help lessen many of the emotional difficulties that are common for people going through a breakup, such as anger, sadness, and anxiety. Although no one has ever studied the effects of mindfulness training on breakup distress, we think

mindfulness is a potentially important way of dealing with your experience. Mindfulness may help make it a little easier to handle your painful thoughts and feelings and to develop some sense of mastery over yourself.

You may not feel better right away, or at all, but in order to get the most benefit from the technique it is important that you do it frequently. Mindfulness is a capacity that you develop over time, which means practice is important to becoming good at it. Like learning any sport or skill, you will get better at mindfulness the more you do it. Once you have learned the skill, you can use it more easily. However, in the beginning, it is important to practice the technique regularly so you can get better at noticing and responding to your experiences without judgment. Later, you may start to recognize how mindfulness benefits you when you are feeling stressed or upset. We recommend that you practice the exercises every day, whenever possible. You may choose any time that works with your schedule, but many people find that practicing after waking up or before going to bed is convenient. Practicing at approximately the same time every day makes it more likely that you will do the exercises regularly and thus receive the most benefit possible. Even if you start to feel better, it will be helpful to continue practicing in order to continue receiving the benefits of the practice. Also, your participation in this study could benefit other individuals in a similar situation, because the researchers can learn more about if and how mindfulness helps with the stresses of experiencing a breakup.

*Body Scan Exercise**

*Exercises adapted from *Mindfulness-Based Cognitive Therapy for Depression* (Segal, Williams, & Teasdale, 2002) and other sources

Start by allowing your body to take a comfortable resting position. You might want to lie down with your back on the floor, using a rug, blanket, or yoga mat for softness and warmth.

Alternatively you may want to lie on your bed or relax in a reclining chair. Let your eyes close and turn your attention inward. Keeping your eyes closed throughout the exercise will help you keep your awareness on your internal experience. Pay attention for a few moments to the movement of your breath as it flows in and out, in and out. See if you can begin to release your thoughts and feelings with each outbreath, becoming more and more aware of any small movements in your belly, chest, back, or throat (30 seconds).

Next, allow your awareness to move to any physical sensations you may be experiencing in your body. For instance, you may notice subtle sensations of pressure where your body is touching the floor, bed, or chair, or where your clothes or hair touch your body. As the breath continues to flow in and out, allow yourself to let go a little more with each exhale, allowing your body to sink down more and more deeply. Although you may start to feel more and more relaxed, the purpose of this practice is not to necessarily feel different, or to be more relaxed and calm. Instead, the aim of the practice is to simply notice whatever sensations you experience as you bring your attention to each part of your body. As you practice, you may notice that your attention strays away from your breath and body. For instance, you might find yourself thinking about the breakup or about your ex. This is normal and to be expected. When you notice that your awareness has wandered, simply acknowledge it, noticing where your mind has gone, and gently bring your attention back to your breath and your body. Don't worry about doing the practice "right" – just notice what *you* experience as you experience it (1 minute).

As you continue to breathe in and out, bring your awareness to any sensations in your abdomen, noticing how your physical experience changes as you inhale and then exhale. Notice how the pattern of sensations continually changes, how your belly rises and falls, perhaps how your

clothes feel a little tighter and then looser against your skin. Observe these constantly changing sensations in your abdominal area for a minute or two (2 minutes).

Next, direct your awareness to your chest and back. Just as before, notice how your physical experience changes as you inhale and exhale, how the pattern of sensations continually changes. Perhaps you can feel your ribcage expand and contract as you breathe or how different parts of your back alternately touch and release from the floor. Stay with the experience in your chest and your back for several minutes. Maintain a gentle, playful attitude, approaching your experience only with openness and curiosity about what is happening and how it is changing (2 minutes).

Now, move your awareness away from your torso and into your arms and hands, observing any physical sensations you experience in this part of your body as you continue to breathe. You may notice the touch of your fingers against each other or the temperature of your skin. Notice the places where your arms touch the floor, bed, or chair. On an exhale, imagine your breath rising to exit your lungs and then flowing out through your arms and your fingertips. Allow your arms and hands to sink more deeply into whatever they are resting on. On an inhale, imagine the breath coming in through the fingertips, passing through your arms and entering the lungs. Approach this playfully – it can be difficult at first – and continue breathing in through your fingertips and back out again through the fingertips, simply noticing whatever physical sensations you experience. Spend a few minutes breathing and observing your experience this way (2 minutes).

Continue moving your awareness upward, into your shoulders, neck, head, and face. Focus on each of these parts of the body in turn, remaining open and curious to your experience. Which parts of your body are in contact with the ground? Is there any tension anywhere in this

area? Can you breathe into that tension and let it go? On an inhale, imagine the breath entering through the top of your head, passing down your face, through your neck and shoulders, and into your lungs... and then returning upward again as you exhale. Practice breathing with any physical sensations – keep your awareness subtly on the breath while you explore the sensations in your shoulders, neck, head, and face. Spend some time focused on this area as you breathe, sinking more deeply into the ground with each exhale. If your attention wanders, gently bring it back to any bodily sensations you are experiencing, noticing how they change as you inhale and exhale (2 minutes).

Finally, move your awareness into your legs and feet. With openness and curiosity, notice any parts of your lower body that are in contact with the ground, your clothing, or other parts of your body. Perhaps you can feel your thighs, knees, heels, or toes touching each other. On an inhale, imagine the breath entering your lungs, passing into your abdomen, and through your legs, feet, and toes. As you exhale, imagine your breath returning, coming up out of your toes, into your feet and legs, and passing out through your abdomen, chest, and nose. Allow the feet and legs to let go completely, noticing how the sensations change. Continue breathing this way, with the sensations, for a minute or two (2 minutes).

In each area of the body, do your best to pay close attention to any physical sensations while maintaining an attitude of openness and curiosity. For each area, breathe in to that part of the body as you inhale, and let go as you exhale. If you notice any pressure, tension, pain, or other intense physical sensations in a body part, try to “breathe in” to that area. Allow each inhale to bring gentle awareness into the physical sensations and allow each exhale to provide a sense of letting go. Once you have breathed into all the various parts of your body, take a few

minutes to be aware of the body as a whole. Feel the breath flowing in and then out, in and out, and notice your physical sensations generally (2 minutes).

Now that you have brought your breath and awareness to your entire body, slowly bring your awareness back to the room around you. Begin to wiggle your finger and toes. Roll your ankles and wrists from side to side and begin to rotate your arms and legs. Turn your neck slowly back and forth a few times and lift your head, allowing your neck to gently stretch. Finally, open your eyes and return to a seated position. Spend just a minute noticing if there are any strong physical sensations remaining in any part of your body or if there were areas where you had trouble noticing sensations during the exercise (30 seconds). Return to your daily routine when you are ready.

Between Session Instructions

Download the mp3 of this exercise and do the body scan exercise each day until you listen to the 2nd session, one week from today. Spend approximately 20 minutes to cover all parts of the body. Don't expect to feel anything in particular from doing the exercise. Give up all expectations about it, just letting your experience be your experience. Don't judge your experience, just keep doing the exercise. Should you notice yourself falling asleep during the body scan, you may want to practice the exercise in a comfortable seated position rather than in a reclining position. Alternatively, you may want to keep your eyes open. Be sure to record on the daily log each time you listen to the mp3 and do the exercise.

Session Two

Introduction

Welcome to session two. As we mentioned before, it's normal to have a range of experiences after a breakup. Your thoughts and feelings may still be there, although perhaps they

have changed a little. It's likely that you are still experiencing at least some intense emotions, perhaps a little less than before or perhaps a little more. Either of these experiences is normal. Just notice what it is like for you, without comparing or judging. Congratulate yourself for continuing to move forward, despite any difficulties you have been experiencing.

As we also mentioned last week, it is not unusual for it to take some time to feel better after a breakup. You might even feel better one day, but then worse the next day. You may have found that doing the exercise you learned last week was helpful one day but made things worse the next. You may have been able to practice the skill easily one day, but been unable to focus or stay interested the next. These experiences are all normal too. Remember that learning a new skill can take time and practice is important. As we progress through the exercises each week, you will have different kinds of days and different kinds of experiences.

For instance, your mind may wander while doing the mindfulness exercises – many people experience this when trying to focus their attention. This is what minds normally do; don't get discouraged. The body scan is a way of helping to change this habit of mind. You're learning to notice your current experience, and then let it go as it changes. Although this sounds easy, you've likely discovered that it's not always so simple. It requires a strong intention and commitment. Although it may feel less frustrating to simply quit the exercise early, or skip it entirely, you will get more out of this program the more you put into it. If you experience boredom, frustration, sleepiness, doubt, pessimism, or other negative emotions, you're not alone. As you try to do the new exercise each day this week, pay attention to what comes up for you. Just notice it the same way you noticed bodily sensations when doing the body scan exercise last week. If you experience positive feelings, such as pleasure, relaxation, or bliss, simply notice those too. The reactions you have to the exercises don't mean you're doing it "right" or "wrong."

They just show that you're paying attention to your experience. The most important thing is to stay open and curious to whatever is happening.

We hope that you were able to find some time to practice the body scan each day; but if not, know that developing a new habit is difficult and don't be too hard on yourself. It is good that you have come back to try again. You can make a new commitment today to engage with the exercises this week. Today you'll learn a new skill that may be helpful to you in dealing with whatever arises for you in working through this time of your life. This skill is called mindfulness of breath and will build on the skills you learned in the body scan exercise.

Mindfulness of Breath Exercise

Begin by taking a comfortable seated position on either a chair or the floor. If you prefer a chair, be sure to choose one with a straight back and sit away from the back of the chair, if possible, so your spine is self-supporting. Place your feet firmly on the floor with your legs uncrossed. If you choose to sit on the floor, support your buttocks on a firm pillow, cushion, or small stool, and adjust its height so that your knees touch the floor, if possible, and so that you feel comfortable and well-supported. Keep your back straight without tensing, simply allowing the vertebrae in your spine to stack gently on top of one another. In either position, allow your arms to rest comfortably at your sides, resting either on your legs or the chair. Once you have found a comfortable position, let your eyes close and turn your attention inward. Keeping your eyes closed throughout the exercise will help you keep your awareness on your internal experience. As in the body scan, become aware of any physical sensations in your body, for instance the places where your body touches the floor or chair and where different parts of your body touch each other. Take several minutes to observe these physical sensations. Remember

that the intention of this practice is not to feel different or relaxed, but simply to observe your experience.

Next, begin to pay attention to the movement of your breath as it flows in and out, in and out. As you continue to breathe, bring your awareness to any sensations in your abdomen, noticing how your physical experience changes as you inhale and then exhale. Notice how the pattern of sensations continually changes, how your belly rises and falls, perhaps how your clothes feel a little tighter and then looser against your skin. Observe these constantly changing sensations in your abdominal area for a minute or two, bringing your full attention to this area. Notice how the breath enters and exits your body as you breathe and how each breath may feel the same or somewhat different – longer or shorter, deeper or more shallow. Do not change your breathing in any way; just notice its normal pattern.

Continue breathing naturally in this way, letting the breath breathe itself without any conscious effort and noticing any sensations in your abdominal area. In addition, try to bring this same “allowing” attitude to your entire experience and to this practice. There is nowhere to go, nothing to do, no one in particular to be. Just notice what is...now. Allow your experience to be whatever it is, without needing to fix or change it. Maintain a gentle, playful attitude, approaching your experience only with openness and curiosity about what is happening and how it is changing. You may notice at some point that your mind has wandered away from the breath and abdominal sensations. You may find yourself daydreaming, falling asleep, or thinking about someone or something. Perhaps you are thinking about the breakup or about your ex. This is perfectly ok. It is what minds tend to do and is to be expected. Do not be hard on yourself or consider this a failure. Actually, you have been successful at noticing that you are not aware of your present experience and now you can gently bring your awareness back to your experience

in this moment. Notice again your breath and the ever-changing physical sensations in your abdominal area as you breathe in and out, in and out.

Whenever you notice that your mind has wandered from the breath and sensations, congratulate yourself. You have reconnected with your current experience, with your breath and body. Renew your intention to maintain an easeful awareness of the changing patterns of sensation accompanying each new breath. This is likely to happen over and over again. Maintain an attitude of kindness toward yourself as you learn this new skill. You might think of your mind like a young puppy or a small child that curiously explores everything around it. There is no need for harshness or punishment, but rather this is an opportunity to practice patience and acceptance. Continue with the practice for at least five more minutes. A bell will chime at that time; however, you can turn off the recording for some time if you wish to practice longer. Remember that your purpose is simply to maintain awareness, the best you can, of whatever you are experiencing in each moment as the breath continually flows in and then out again, in and then out.

Between Session Instructions

Download the mp3 of this exercise and listen to it, continuing the Mindfulness of Breath exercise for 15 minutes, or longer, each day until you listen to the 3rd session, one week from today. You might want to set an alarm for 15, 20, or 30 minutes or longer so you can end the practice when you intend. Be sure to record on the daily log each time you listen to the mp3 and how long you do the exercise. Try to record your practice accurately, without judging yourself or needing to exaggerate or impress. Your experience is whatever it is.

Session Three

Introduction

Welcome to session three. Have you noticed your post-breakup experience changing? The negative thoughts and emotions that accompany a breakup do not disappear overnight, and often take a long time to go away, but over time they change in numerous ways. You probably still feel bad about your breakup, but perhaps you are noticing new thoughts and emotions as well or a change in how often you experience your old thoughts and feelings. Perhaps you've noticed improvements in your sleep, appetite, or concentration. Hopefully you've learned some things about yourself as you go through the process of recovering from the pain of a breakup. Are you angrier than you realized? Do you love more deeply than you knew? Is it hard for you to forgive? Do you hate being alone? While these realizations may be difficult, your breakup experience is changing you.

Hopefully, this program is also having some effect on how you're handling the experience. You may or may not be aware of these changes, but it's likely that they're happening. So far in the program you've learned two mindfulness exercises and had two weeks to practice them. Perhaps things are going well and you have stood by your commitment to practice regularly – if so, congratulations. If not, perhaps you can see this program as a way to take care of yourself, a way to take about 20 minutes each day to do something positive for yourself. As we mentioned previously, mindfulness has been shown to be effective at reducing negative emotions, managing painful thoughts and feelings, and developing a greater sense of mastery over yourself. It's only by giving the program a fair shot that you'll know if it can work for you. We're halfway through the program and there are still two exercises to learn – we hope you'll make the most of them and practice as much as you can. Today you'll learn a mindfulness of breath and body exercise which builds on what you've been doing so far. Although it's very similar to what you have already been doing, this exercise is an attempt to “just sit,” allowing

yourself to feel the breath simultaneously throughout the whole body, rather than noticing each part separately or focusing primarily on the breath sensations in the abdominal area.

Mindfulness of Breath and Body Exercise

Practice mindfulness of breath for approximately 10 minutes, either on your own or by listening to the beginning of the mp3 from last week. Stop this audio now to do so and then continue when you are ready.

Now that you have practiced awareness of breath for some time, deliberately allow your attention to expand to encompass your entire physical body and any sensations you experience anywhere in the body. Notice, for instance, the places where your feet, knees, or buttocks touch the floor or chair and the places where different parts of your body touch each other, such as where your arms touch your sides or your legs, or where your hair touches your ears, neck, or face. Remain aware, in the background, of your breath and lower abdomen, but at the same time bring your primary attention to the physical body as a whole, noticing the ever-changing pattern of sensations you experience throughout the body. It can be helpful to think of combining the body scan exercise and the breath practice into one and to think of the entire body as if it were breathing with each inhale and each exhale. Do the best you can to maintain awareness of all of these sensations, as well as a sense of the body as a whole and of your breath as it moves in and out. Don't attempt to move your attention from part to part or to focus on any particular area. Just allow your breath to be...throughout your entire body.

As before, your mind is likely to wander away from the bodily sensations and the breath. You may start to think about the breakup or your ex or to feel strong emotions. Remember that this is not a mistake, but is normal and to be expected. Whenever you observe that your mind is somewhere else – thinking, daydreaming, drifting – gently bring it back with an attitude of

openness, curiosity, kindness, and patience to the breath and a sense of the entire body.

Congratulate yourself that you have now brought your awareness back to the present moment and to your current experience. If you experience difficult emotions, do your best to let them remain in the background and allow your breathing body to be the primary focus of attention. If this is too difficult, you can focus your attention specifically on sensations in the abdominal area as you did last week.

Similarly, if you experience intense sensations, such as in the back, neck, or shoulders, or in the legs, knees, and ankles, it is likely that your attention will be frequently drawn to these areas and these sensations. This too is normal. As best you can, bring your attention back to the breath and the body as a whole; however, if this feels impossible, these times offer you the chance to bring your awareness gently to the area of intensity and to explore the sensations you are experiencing in a precise but gentle way. What exactly do the sensations feel like? Where are they specifically – where on the physical body do they start and end? Do they come and go or otherwise vary over time? Notice as much as you can the detailed pattern of the sensations, but try not to think about as much as to simply experience it. Your breath can be a tool to help you bring awareness to these areas of intensity. Just as in the body scan, you can gently breathe into the intense area and then breathe out while letting go. Should you become distracted by the intensity of the sensations, bring yourself back to the present moment by reconnecting with the breath and the sense of the body as a whole. Then allow yourself to experience the pattern of sensations throughout the entire body.

Between Session Exercise

Download the mp3 of the Mindfulness of Breath and Body exercise and listen to it each day until the 4th session, one week from today. Focus on awareness of the breath for approximately 10

minutes before allowing the awareness to expand to include a sense of physical sensation throughout the whole body for 5 or more minutes. Paying attention to bodily sensations may help you become aware of emotions and allow you remain present with them without judgment or reaction. Be sure to record on the daily log each time you listen to the mp3, being as honest as possible about how often and for how long you practice.

Fourth Session

Introduction

Welcome to the fourth and final session. Congratulations – you stuck with it! Hopefully you know by now that you will not always feel as badly as you did when you first went through your breakup. Even if you still feel terrible, hopefully you now know that your thoughts and feelings will come and go, that they will vary in intensity, and that eventually you will move on to new and different things. Even if today is not the day, the day will come when you are over this breakup. Hopefully you have also learned that there are tools that can help you along this journey. Perhaps the mindfulness skills you have learned can be one of those tools.

Although this is the last session of the intervention, you will be asked to continue practicing for at least one more week. Today you will learn a fourth exercise – mindfulness of sounds and thoughts. As previously, you will have one week to practice what you have learned. At that point, you will be asked to complete the questionnaires again (post-intervention). This is very important for the study, so if possible, please maintain your commitment for the next seven days. We anticipate that this will be of benefit to you, and other individuals going through a breakup. Your participation is valuable. We would also like to take this time to remind you that you will be asked to complete the measures a third time (follow-up) approximately five weeks from today (one month after the end of the study). It will be up to you if you would like to

continue practicing during that month the skills you previously learned. We think it will be beneficial, but the most important part is that you complete the questionnaires a final time so that your participation in the study is complete and we can learn from your experience.

Let's learn the fourth exercise – mindfulness of sounds and thoughts – now.

Mindfulness of Sounds and Thoughts Exercise

Start by practicing mindfulness of breath and body on your own for 10 minutes. If you have time, you can listen to the 15 minute audio from last week instead. That is not necessary, but could be helpful. Stop now until you are ready and start this audio again when you are ready. Now, let your awareness shift from focusing on bodily sensations to paying attention to the sounds around you. Focus your attention on your ears and expand your awareness to whatever arises in your hearing. Do not search for sound in general or for any particular sounds, just be receptive to whatever sounds arise around you. You might hear sounds arising from your body – the rustling of your clothes as you shift position or the gurgling of your stomach, for example. Or you may hear sounds near you in the room – a clock ticking, electronic devices whirring, or a cat purring. You may also hear sounds that are further away, outside the room – such as people talking, cars revving or braking, someone typing on a computer, doors opening or closing, or a dog barking or bird singing. To the best of your ability, open your mind to becoming aware of sounds arising from any direction around you – in front, behind, to the side, above, or below. As you focus your attention on sound, you might also become aware of the most subtle sounds or of the silence which hangs between sounds.

As you maintain your awareness on any sounds around you, try to perceive them only as sensations, rather than thinking about them. For instance, pay attention to sensory qualities such as loudness, pitch, or duration rather than to the meaning of the sounds. If you notice that you are

thinking about the sounds, bring your attention gently back to these sensory qualities as you experience them in the moment. Notice how sounds arise and pass away from moment to moment, ever changing like the sensations in the body. Eventually, you are likely to find that your attention drifts from awareness of sounds to thinking, daydreaming, or some other mental activity. When this happens, remember that this is normal and is not a failure. Acknowledge what has happened and bring an attitude of openness and curiosity to your experience. Gently, return your awareness back to sounds as they arise in the moment.

Next, release your attention from awareness of sounds and focus instead on thoughts as they arise in the mind. As with sounds, do your best to simply notice when thoughts arise and when they disappear. Do not try to change your experience in any way by forcing thoughts to come or go. Just as with sounds, allow your open awareness to notice when thoughts arise, develop, and pass away, naturally. Let them simply pass through the mind on their own, observing them with ease. The thoughts may be pleasant or unpleasant, they may or may not relate to your breakup. Any of these experiences is normal. If you find that observing your thoughts is difficult and instead feel caught up in them, it may help to imagine them as if they were being projected like a movie on a screen at the cinema. You simply look at the screen, waiting to see if a thought arises. If so, focus your attention on it while it is displayed on the screen and then let go of the thought when it passes away. Maintain an open attitude of curiosity toward your experience.

Between Session Exercise

Download the mp3 of the Mindfulness of Sounds and Thoughts exercise and listen to it each day for the next week, until you complete your second set of study questionnaires. Mindfulness of sounds is a useful practice for expanding awareness in a spacious way. Focus on

awareness of the breath and bodily sensations for approximately 10 minutes before allowing the awareness to expand to include sounds and thoughts. Be sure to record on the daily log each time you listen to the mp3.

APPENDIX E: RELAXATION TRAINING PROGRAM

Session 1:

Introduction

It's normal to have a range of feelings after a breakup, many of them negative. You are likely feeling some combination of sadness, anger, loneliness, uncertainty, and guilt. Even if you were the one who initiated the breakup, or know that what happened is for the best, the end of a relationship can still be very painful. Someone who was once important to you has changed their role or is no longer in your life at all. Your hopes and dreams have been shaken or even crushed, and many of your other relationships may have been affected as well. You might be questioning who you are and what you want, why you made certain decisions, what qualities you want in a partner, perhaps if you ever want to have a relationship again in the future. You might be not be able to sleep, may have difficulty concentrating on your school work, or are perhaps eating more or less than usual. Your thoughts and feelings may be overwhelming at times and feel very intense and difficult to control. None of this is unusual after a breakup. Fortunately, there are some things you can do to help with these strong reactions and emotions about the breakup.

The purpose of this study is to provide you with some new ways of coping with and responding to your thoughts and feelings about your recent breakup. You have been assigned to the relaxation training part of the study. Relaxation training is just what it sounds like – it teaches you to relax your body and mind. Relaxation training has been studied for many decades and previous research suggests that it may help with the struggles many people experience after a breakup. For example, relaxation has been shown to help lessen some of the emotional difficulties that are common for people going through a breakup, such as anxiety, stress, and mood fluctuations. Although no one has ever studied the effects of relaxation training on breakup

distress, we think relaxation is a potentially important way of dealing your experience.

Relaxation may help make it a little easier to handle your painful thoughts and feelings and to develop some sense of mastery over yourself.

You may not feel better right away, or at all, but in order to get the most benefit from the technique it is important that you do it frequently. Relaxation is a capacity that you develop over time, which means practice is important to becoming good at it. Like learning any sport or skill, you will get better at relaxation the more you do it. Once you have learned the skill, you can use it more easily. However, in the beginning, it is important to practice the technique regularly so you can get better at recognizing and controlling the opposing sensations of tension and relaxation. Later, you may start to recognize how relaxation benefits you when you are feeling stressed or upset. We recommend that you practice the exercises every day, whenever possible. You may choose any time that works with your schedule, but many people find that practicing after waking up or before going to bed is convenient. Practicing at approximately the same time every day makes it more likely that you will do the exercises regularly and thus receive the most benefit possible. Even if you start to feel better, it will be helpful to continue practicing in order to continue receiving the benefits of the practice. Also, your participation in this study could benefit other individuals in a similar situation, because the researchers can learn more about if and how relaxation helps with the stresses of experiencing a breakup.

*Full Progressive Muscle Relaxation Method (16 muscle groups)**

*Exercises adapted from *Progressive Relaxation: Abbreviated Methods* (Bernstein, Carlson, & Schmidt, 2007) and other sources

The techniques you are about to learn are collectively called progressive muscle relaxation, or PMR for short. They were developed many decades ago by a doctor interested in helping people relieve tension, although the techniques have been modified since then to make them easier to learn. Essentially, PMR teaches people to first tense and then relax the different muscles in their body and to pay close attention to the sensations of both tension and relaxation. Although it may seem counterintuitive to tense your muscles, this part of the practice is important because it helps you learn to produce large and noticeable reductions in tension. In a sense, it provides you with a “running start” toward very deep relaxation. You might think of it like a pendulum – the more you pull it back, the further the pendulum will swing when you release it. The contrast between tension and release makes it easier for you to compare the two states and to appreciate what each one feels like.

As you listen to the instructions, try to pay attention to sensations in only the specified muscle group, relaxing the rest of your body as much as possible. The instructions will say, for example, “tense the muscles in your forehead by raising your eyebrows now.” When you hear the word *now*, this will be your cue to tense the muscles. Do not tense your muscles until you hear the word *now*. Tense each muscle group vigorously, but without straining, for about 5 seconds. Then, when the instructions say, for example, to relax all the muscles in your forehead, let all of the tension go at once, not gradually. During the exercise, try not to move any more than necessary to remain comfortable, especially muscles you have already tensed and relaxed. This will help prevent tension from reappearing. If you have any pain or discomfort at any targeted muscle group, feel free to omit that step.

Let’s begin. Start by allowing your body to take a comfortable resting position. You might want to lie down with your back on the floor, using a rug, blanket, or yoga mat for softness

and warmth. Alternatively you may want to lie on your bed or relax in a reclining chair. Let your eyes close and turn your attention inward. Keeping your eyes closed throughout the exercise will help you to relax and to stay relaxed as much as possible. Start by focusing your attention on your right hand and forearm. Create tension in the lower arm and hand by making a tight fist while allowing your upper arm to remain relaxed. Tense the muscles *now* and hold the tension for approximately 5 seconds, noticing the tightness in that area and noticing what the tension feels like. Hold...and now *relax*. Abruptly release and feel the tension falling away. Notice the difference between the tension you were feeling before and the pleasant feelings of relaxation you are now experiencing. Focus all of your attention on feelings of relaxation flowing into your right forearm and hand. Spend a little time enjoying that relaxation (30 seconds).

Next, focus your attention on your right upper arm. Create tension in the upper arm by pressing your elbow downward against the chair, floor, or bed without using your lower arm at all. Tense the muscles *now* and hold that tension for about 5 seconds, noticing the tightness in that area and what the tension feels like. Hold...and now *relax* all at once, letting the tension melt away, noticing the difference. Focus all of your attention on feelings of relaxation flowing into your upper arm. Again, spend a few moments noticing and enjoying the feeling of relaxation. (30 seconds).

[Repeat above two on left side]

Next, focus your attention on your forehead. Create tension in your forehead by raising your eyebrows as high as possible. Tense those muscles *now* and hold for 5 seconds, noticing tightness in that area and observing what the tension feels like. Hold...and now *release*. Notice the difference between the tension in your forehead and the feelings of softness you are

experiencing there now. Focus all of your attention on feelings of relaxation flowing into your forehead and spend some time enjoying those feelings. (30 seconds).

Next, focus all of your attention on your upper face, including your cheeks and nose. Tense that area by squinting your eyes and wrinkling your nose. Tense the muscles *now* and hold for 5 seconds, noticing the feelings of tightness and tension in that area. Hold...and now *release* the muscles. Notice the difference between the feelings of tension and relaxation in your upper face. Focus all of your attention on feelings of relaxation flowing into your cheeks, nose, and eyes. Enjoy the pleasant feelings of relaxation for some time. (30 seconds).

Next, bring your awareness to your lower face. Tense that area by clenching your teeth and pulling back the corners of your mouth. Tense those muscles *now* and hold. Notice the feelings of tightness and tension in that area. Hold...and now *relax*. Notice the difference between the feelings of tension and relaxation in your lower face. Focus all of your attention on feelings of relaxation flowing into your mouth. Enjoy the pleasant feelings of relaxation for some time. (30 seconds).

Next, focus all of your attention on the muscles in your neck. Tense that area by trying to raise and lower your chin simultaneously *now*. Pay attention to the tightness and tension for a few seconds. Now *relax* all of the muscles and allow your head and neck to sink slowly into the chair, bed, or floor. Enjoy the feelings of relaxation flowing into your neck muscles for a little while. (30 seconds).

Next, bring your attention to the muscles in your chest, shoulders, and upper back. By taking a deep breath and holding it, pull your shoulder blades back and together and tense all of those muscles *now*. Notice the tension and tightness, what that tension and tightness feels like. Hold it...and *release*. Let all the tension go and notice the difference between the tension and the

feeling of relaxation. Allow feelings of relaxation to flow into your chest, shoulders, and back. (30 seconds).

Next, bring your attention to the muscles in your abdomen. Try to simultaneously push out and pull in your stomach. Tense the abdominal muscles *now*. Pay attention to the feelings of tension and tightness for several seconds. Then *release*, abruptly letting the tension go and allowing relaxation to flow into your stomach area. Enjoy the pleasant sensations of relaxation for a little while (30 seconds).

Next, bring your awareness to your right upper leg. Pull down on your thigh muscles and up your hamstrings, tightening and tensing the top larger muscle against the bottom smaller ones. Tense the upper leg muscles *now*, paying attention to the feelings of tension. Then *relax*, releasing the muscles all at once. Allow feelings of relaxation to flow into the upper leg and pay attention to these sensations for some time. (30 seconds).

Next, put your attention on your right calf muscles. Pull your toes back toward your head and tense the muscles *now* (5 seconds). Then *relax*, releasing the calf muscles and letting warmth and relaxation flow into that area. Observe these pleasant sensations for a while (30 seconds). Next, bring your awareness to your right foot. Point your toes downward, turn your foot in, and curl your toes gently to tense the muscles *now* (5 seconds). Then *release*, noticing feelings of relaxation flowing into the foot. Pay attention to these sensations for a few moments (30 seconds).

[Repeat above three on left side.]

At this time, simply notice the pleasant feelings of relaxation throughout your entire body. Imagine waves of relaxation slowly spreading through your body beginning at your head and going all the way down to your feet. Your muscles will feel warm, heavy, and relaxed (2

minutes). Now, slowly begin to move your feet and legs. Then gently open and close your hands and rotate your arms. Turn your neck and move your head slowly from side to side. When you are ready, open your eyes and sit up. Spend a moment noticing any areas of tension remaining in the body or areas where you had difficulty relaxing during the exercise (30 seconds). Return to your daily routine when you are ready.

Between Session Instructions

Download the mp3 of this exercise and do the progressive muscle relaxation exercise each day until you listen to the 2nd session, one week from today. Spend approximately 20 minutes to cover all the parts of the body. During the exercise, try to become clearly aware of what tension really feels like. Then notice how the feeling of tension contrasts with the feeling of relaxation. Try to become clearly aware of what relaxation really feels like. Should you notice yourself falling asleep during the relaxation training, you may want to practice the exercise in a comfortable seated position rather than in a reclining position. Alternatively, you may want to keep your eyes open. Be sure to record on the daily log each time you listen to the mp3 and do the exercise.

Session Two

Introduction

Welcome to session two. As we mentioned before, it's normal to have a range of experiences after a breakup. Your thoughts and feelings may still be there, although perhaps they are a little different. It's likely that you are still experiencing at least some intense emotions at this time. Whatever your experience, it is normal. Congratulate yourself for continuing to move forward, despite any difficulties you have been experiencing.

As we also mentioned last week, it is not unusual for it to take some time to feel better after a breakup. You might even feel better one day, but then worse the next day. You may have found that doing the exercise you learned last week was helpful or that it seemed to make things worse. You may have been able to practice the skill easily or been unable to focus or stay interested. These experiences are all normal. Remember that learning a new skill can take time and practice is important. As we progress through the exercises each week, no matter how you are feeling, the most important thing is to stay focused on the sensations of relaxation and how they contrast with feelings of tension in your body.

Over the past week, you may have encountered one or more difficulties with the PMR technique. Perhaps, you felt like you simply could not relax. Even if you *did not* relax, this does not mean you *cannot* relax. With practice, it will get easier. Similarly, you may have found it difficult to tense only one part of your body without tensing other parts. Don't worry – many people have trouble with this, but find that they are able to focus on specific parts of the body more easily after a few days or weeks of practice. Finally, you may have found yourself thinking a lot while attempting to relax. This is okay, just continue doing the technique daily, whenever possible. Many people find that they take two steps forward, and then one step back, which can be discouraging. Nonetheless, you'll slowly make progress even though it's hard. You've probably discovered that it's not quite as easy to relax as it sounds. In fact, it requires a strong intention and commitment. Although it may feel less frustrating to simply quit the exercise early, or skip it entirely, you will get more out of this program the more you put into it. If you experience boredom, frustration, sleepiness, doubt, pessimism, or other negative emotions, you're not alone. As you try to do the new exercise each day this week, don't give up. Eventually you'll gain better control over your mind and body.

We hope that you were able to find some time to practice the PMR exercise each day; but if not, just remember that developing a new habit is difficult and don't be surprised by this. It is good that you have come back to try again. Perhaps you can make a new commitment to engage with the exercises this week. Today you'll learn a modified PMR technique that may help you find it easier to relax during your experience of whatever you are working through at this time of your life. This exercise uses fewer muscles groups than before by combining some of the areas of your body, but the basic procedure is the same.

7-Muscle Group PMR Exercise

Lie down and make yourself comfortable, lying on your back on a mat or rug on the floor or on your bed, or perhaps reclining in a soft chair. As you listen to the instructions, try to pay attention to sensations in only the specified muscle group, relaxing the rest of your body as much as possible. Some of the muscle groups will be combined this week and each muscle group will be tensed and released twice. Remember to tense your muscles when you hear the word *now* during the instructions. Tense each muscle group vigorously, but without straining, for about 5 seconds. Then, when the instructions say to relax, let all of the tension go at once, abruptly. During the exercise, try not to move any more than necessary to remain comfortable, especially muscles you have already tensed and relaxed. If you have any pain or discomfort at any targeted muscle group, feel free to omit that part of the body from the exercise.

First, allow yourself to get comfortable and close your eyes. Start by focusing your attention on your right hand, forearm, and upper arm. Create tension by making a tight fist and simultaneously pressing your elbow downward against the chair, floor, or bed. Tense the muscles *now* and hold the tension for approximately 5 seconds, noticing tightness in that area and what the tension feels like. Hold...and now *relax*. Abruptly release and feel the tension falling away.

Notice the difference between the tension you were feeling before and the pleasant feelings of relaxation you are now experiencing. Focus all of your attention on feelings of relaxation flowing into your right hand and arm. Spend a little time enjoying that relaxation (30 seconds). [Repeat once on right side, then two times on left]

Next, focus your attention on all of your facial muscles, including your forehead, eyes, cheeks, nose, and mouth. Create tension by raising your eyebrows as high as possible, squinting your eyes, wrinkling your nose, clenching your teeth, and pulling back the corners of your mouth. Tense the facial muscles *now* and hold for 5 seconds, observing the tightness and tension in the entire face. Hold...and now *release*, noticing the difference between the tension you experienced before and the softness you are experiencing now. Focus all of your attention on feelings of relaxation flowing into your forehead, eyes cheeks, nose, and mouth. Spend a little time enjoying those pleasant sensations. (30 seconds). [Repeat]

Next, focus all of your attention on the muscles in your neck. Tense that area by trying to raise and lower your chin simultaneously *now*. Pay attention to the tightness and tension for a few seconds. Now *relax* all of the muscles and allow your head and neck to sink slowly into the chair, bed, or floor. Enjoy the feelings of relaxation flowing into your neck muscles for a little while. (30 seconds). [Repeat]

Next, bring your attention to the muscles in your chest, shoulders, upper back, and abdomen. By taking a deep breath and holding it, pull your shoulder blades back and together and tighten your stomach. Tense all of those muscles *now*, noticing the feelings of tightness and what the tension feels like. Hold it...and *release*. Let all the tension go and notice the difference between that and the feelings of relaxation you are experiencing now . Allow warm relaxation to flow into your chest, shoulders, back, and abdomen. (30 seconds).

Next, bring your awareness to your right upper leg, calf, and foot. Squeeze the back and front of the thigh together, flex your calf muscles, and tense the foot and toes. Tighten all of the muscles in the right leg *now*, observing the feelings of tension. Hold...and then *relax*. Release the muscles all at once, allowing the leg to go limp as it rests against the chair, bed, or floor. Let feelings of relaxation flow into the entire leg and foot and pay attention to these sensations for some time. [Repeat once on right and then twice on left side.]

At this time, simply notice the pleasant feelings of relaxation throughout your entire body. Imagine waves of relaxation slowly spreading through your body beginning at your head and going all the way down to your feet. Your muscles will feel warm, heavy, and relaxed (2 minutes). Now, slowly begin to move your feet and legs. Then gently open and close your hands and rotate your arms. Turn your neck and move your head slowly from side to side. When you are ready, open your eyes and sit up. Spend a minute or two noticing any areas of tension remaining in the body or areas where you had difficulty relaxing during the exercise.

Between Session Instructions

Download the mp3 of the 7-muscle group PMR exercise continue practicing it each day until you listen to the 3rd session, one week from today. Expect to spend at least 15 minutes doing the exercise, although you can continue to relax for another 5 to 15 minutes or longer after the exercise, if you like. You might want to set an alarm so you can end the practice when you intend. During the exercise, continue to focus your awareness on what tension feels like and how it contrasts with feelings of relaxation. Be sure to record on the daily log each time you listen to the mp3 and for how long you do the exercise. Be honest about how long you practice.

Session Three

Introduction

Welcome to session three. Have you noticed anything different about your post-breakup experience? The negative thoughts and emotions that accompany a breakup do not disappear overnight, and often take a long time to go away, but over time they may start to feel different. You probably still feel bad about your breakup, but perhaps you are able to relax more around all your thoughts and emotions. Perhaps you've noticed improvements in your sleep, appetite, or concentration. Hopefully you've learned some things about yourself as you go through the process of recovering from the pain of a breakup. While these realizations may be difficult, they are an important part of your breakup experience. Hopefully, this program is also having some effect on how you're handling the experience. You may or may not be aware of these changes, but it's likely that they're happening.

So far in the program you've learned two relaxation techniques and had two weeks to practice them. Perhaps things are going well and you have stood by your commitment to practice regularly – if so, congratulations. If not, perhaps you can see this program as a way to take care of yourself, a way to take about 15 minutes each day to do something positive for yourself. As we mentioned previously, relaxation has been shown to be effective at reducing negative emotions, managing painful thoughts and feelings, and developing a greater sense of mastery over yourself. It's only by giving the program a fair shot that you'll know if it can work for you. We're halfway through the program and there are still two exercises to learn – we hope you'll make the most of them and practice as much as you can. Today you'll learn another modified PMR technique similar to the exercises you've already learned, but using even fewer muscle groups.

4-Muscle Group PMR Exercise

Lie down and make yourself comfortable, lying on your back on a mat or rug on the floor or on your bed, or perhaps reclining in a soft chair. As you listen to the instructions, try to pay attention to sensations in only the specified muscle group, relaxing the rest of your body as much as possible. Some of the muscle groups will be combined even more this week and each muscle group will be tensed and released three times. Remember to tense your muscles when you hear the word *now* during the instructions. Tense each muscle group vigorously, but without straining, for about 5 seconds. Then, when the instructions say to relax, let all of the tension go at once, abruptly. During the exercise, try not to move any more than necessary to remain comfortable, especially muscles you have already tensed and relaxed. If you have any pain or discomfort at any targeted muscle group, feel free to omit that part of the body from the exercise.

First, allow yourself to get comfortable and close your eyes. Start by focusing your attention on both of your hands and arms. Create tension by making tight fists and simultaneously pressing your elbows down against the chair, floor, or bed. Tense the muscles *now* and hold the tension for approximately 5 seconds, noticing tightness in that area and what the tension feels like. Hold...and now *relax*. Abruptly release and feel the tension falling away from both arms. Notice the difference between the tension you were feeling before and the pleasant feelings of relaxation you are now experiencing. Focus all of your attention on feelings of relaxation flowing into your right hand and arm. Spend a little time enjoying that relaxation (30 seconds). [Repeat two more times]

Next, focus your attention on all of the muscles in your face and neck. Create tension by tightening all of the facial muscle while simultaneously squeezing the neck. Tense the muscles *now* and hold for 5 seconds, observing the tightness and tension in that area. Hold...and now *release*, allowing all of the tension to melt away as your head sinks into the floor, chair, or bed.

Focus all of your attention on feelings of relaxation flowing into your forehead, eyes cheeks, nose, mouth, and neck. Spend a little time enjoying those pleasant sensations. (30 seconds).

[Repeat two times]

Next, bring your attention to the muscles in your chest, shoulders, upper back, and abdomen. By taking a deep breath and holding it, pull your shoulder blades back and together and tighten your stomach. Tense all of those muscles *now*, noticing the feelings of tightness and what the tension feels like. Hold it...and *release*. Let all the tension go and notice the difference between that and the feelings of relaxation you are experiencing now . Allow warm relaxation to flow into your chest, shoulders, back, and abdomen. (30 seconds). [Repeat two times]

Next, bring your awareness to both of your legs and feet simultaneously. Tighten the entire leg and foot, squeezing and flexing the muscles from the top of the thigh to the tips of your toes on both sides. Tense the muscles *now*, observing the feelings of tension. Hold...and then *relax*. Release the muscles all at once, allowing the legs to go limp as they rests against the chair, bed, or floor. Let feelings of relaxation flow into both of your legs and feet and pay attention to these sensations for some time. [Repeat twice]

At this time, simply notice the pleasant feelings of relaxation throughout your entire body. Imagine waves of relaxation slowly spreading through your body beginning at your head and going all the way down to your feet. Your muscles will feel warm, heavy, and relaxed (2 minutes). Now, slowly begin to move your feet and legs. Then gently open and close your hands and rotate your arms. Turn your neck and move your head slowly from side to side. When you are ready, open your eyes and sit up. Spend a minute or two noticing any areas of tension remaining in the body or areas where you had difficulty relaxing during the exercise.

Between Session Instructions

Download the mp3 of the 4-muscle group PMR exercise and listen to it each day until the 4th session, one week from today. Expect to spend at least 15 minutes doing the exercise. During the exercise, continue to focus your awareness on what tension feels like and how it contrasts with feelings of relaxation. Be sure to record on the daily log each time you listen to the mp3, being as honest as possible about how often and for how long you do the exercise.

Fourth Session

Introduction

Welcome to the fourth and final session. Congratulations – you stuck with it! Hopefully you know by now that you will not always feel as badly as you did when you first went through your breakup. Even if you still feel terrible, hopefully you now know that you will experience different thoughts and feelings, that your mind and body can learn how to relax, and that eventually you will move on to new and different things. Even if today is not the day, the day will come when you are over this breakup. Hopefully you have also learned that there are tools that can help you along this journey. Perhaps the relaxation skills you have learned can be one of those tools.

Although this is the last session of the intervention, you will be asked to continue practicing for at least one more week. Today you will learn a final relaxation technique. As previously, you will have one week to practice what you have learned. At that point, you will be asked to complete the questionnaires again (post-intervention). This is very important for the study, so if possible, please maintain your commitment for the next seven days. We anticipate that this will be of benefit to you and other individuals going through a breakup. Your participation is valuable. We would also like to take this time to remind you that you will be asked to complete the measures a third time (follow-up) approximately five weeks from today

(one month after the end of the study). It will be up to you if you would like to continue practicing during that month the skills you previously learned. We think it will be beneficial, but the most important part is that you complete the questionnaires a final time so that your participation in the study is complete and we can learn from your experience.

Let's learn the fourth relaxation exercise now.

Relaxation by Recall

Now that you have learned how to relax by tensing and releasing different muscle groups and have a good sense of what deep relaxation feels like, you will learn to relax your muscles without the tension phase of the exercise. Instead, you will practice relaxing merely by recalling the sensations related to releasing tension. This will help you to control your tension when it occurs in daily situations without having to stop, find a quiet place, and go through the entire relaxation procedure. For now, however, we will continue to spend about 15 minutes relaxing, but the ultimate goal is for you to learn to minimize tension in difficult or stressful situations as they occur. If you find that you cannot achieve relaxation without using the tensing-releasing procedure, you may continue listening to the mp3 from last week instead of this one. Let's give it a try.

Start by focusing all of your attention on the muscles of your arms and hands, all the way from your shoulders down to your finger tips. Give special attention to how the muscles feel, especially noticing any tension or tightness which might be present there (10 seconds). Now, just let the muscles in your arms and hands relax completely by recalling how it felt when you used the tensing procedure and then released the tension. Let any tension go *now*, allowing all of the muscles in your arms and hands to become more and more relaxed, limp, loose, and warm, then spend some time appreciating and enjoying the pleasant, relaxed sensations. (60 seconds).

Next, focus your attention on all of the muscles in your face and neck, including your forehead, eyes, cheeks, mouth, and neck. Again, notice how the muscles feel, with special attention on any tension or tightness you might be experiencing anywhere in this area (10 seconds). Now, simply by remembering how it felt to release the tightness and tension you created in the previous exercises, let all the muscles in your face and neck relax now. Let all of the muscles in this area of your body release, feeling relaxation flowing into your forehead, eyes, cheeks, mouth, and neck. Spend a little time enjoying the pleasant sensations of relaxation (60 seconds).

Next, bring your attention to the muscles in your chest, shoulders, upper back, and abdomen. Notice how the muscles feel and see if there is any tension or tightness at all in that area (10 seconds). Now just let those muscles relax simply by recalling how it felt when you let all of the tension in that area go. Allow your whole upper body – chest, shoulders, upper back, and abdomen – to release, feeling more and more warmth and relaxation flowing into that area. Let the feelings of warm relaxation flow into your chest, your shoulders, your back, and your stomach. (60 seconds).

Next, bring your awareness to both of your legs and feet. Pay attention to how that entire area feels, noticing your upper legs, knees, lower legs, ankles, and feet. See if there is any tightness or tension present anywhere in that area (10 seconds). Now, remembering how it felt to let the tension go, release all the muscles in your legs and feet. Allow your entire lower body to become soft and relaxed. Let feelings of relaxation flow into your legs and feet and just be with these sensations for some time, becoming more and more relaxed (60 seconds).

Finally, allow yourself to feel the pleasant feelings of relaxation throughout your entire body, in your arms and hands, your face and neck, your entire upper body, and your entire lower

body. Imagine waves of relaxation slowly spreading through your body beginning at the top of your head and going all the way down to the tips of your toes. Your muscles will feel warm, heavy, and relaxed (5 minutes). Now, slowly begin to move your feet and legs. Then gently open and close your hands and rotate your arms. Turn your neck and move your head slowly from side to side. When you are ready, open your eyes and sit up. Spend a minute or two noticing any areas of tension remaining in the body or areas where you had difficulty relaxing during the exercise.

Between Session Exercise

Download the mp3 of the Relaxation by Recall exercise and listen to it each day for the next week, until you complete your second set of study questionnaires. Focus on deep feelings of relaxation throughout your body by recalling how it feels to release tension and tightness for the different areas of your body. If you have trouble achieving feelings of relaxation without tensing and releasing the different body parts, listen to the previous mp3 instead of this one. Be sure to record on the daily log each time you listen to the mp3.

APPENDIX F: HUMAN SUBJECTS REVIEW BOARD APPROVAL



BOWLING GREEN STATE UNIVERSITY

Office of Research Compliance

DATE: August 1, 2013

TO: Melissa Falb

FROM: Bowling Green State University Human Subjects Review Board

PROJECT TITLE: [476522-3] Effects of Mindfulness Meditation Training on Individuals Experiencing Non-Marital Post-Breakup Distress: A Randomized Controlled Trial

SUBMISSION TYPE: Revision

ACTION: APPROVED

APPROVAL DATE: August 1, 2013

EXPIRATION DATE: June 17, 2014

REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of Revision materials for this project. The Bowling Green State University Human Subjects Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

The final approved version of the consent document(s) is available as a published Board Document in the Review Details page. You must use the approved version of the consent document when obtaining consent from participants. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please add the text equivalent of the HSRB IRBNet approval/expiration date stamp to the "footer" area of the electronic consent document.

Please note that you are responsible to conduct the study as approved by the HSRB. If you seek to make any changes in your project activities or procedures, those modifications must be approved by this committee prior to initiation. Please use the modification request form for this procedure.

You have been approved to enroll 225 participants. If you wish to enroll additional participants you must seek approval from the HSRB.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. All NON-COMPLIANCE issues or COMPLAINTS regarding this project must also be reported promptly to this office.

This approval expires on June 17, 2014. You will receive a continuing review notice before your project expires. If you wish to continue your work after the expiration date, your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date.

Good luck with your work. If you have any questions, please contact the Office of Research Compliance at 419-372-7716 or hsrb@bgsu.edu. Please include your project title and reference number in all correspondence regarding this project.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Bowling Green State University Human Subjects Review Board's records.