

Mindfulness and Attachment Security as Predictors of Success in Therapy.

By

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Mindfulness and Attachment Security as Common Factors in Therapy

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Abstract

This work focuses on the role of mindfulness and attachment security as agents of change in successful therapy. Two studies were conducted to investigate the mechanisms underlying change that may lead to successful therapy – as reflected in symptomology reduction. Study 1 included 28 clients recruited from two college counseling centers. Measurements of state attachment, mindfulness, depression, and general anxiety were collected daily, as were pre-post trait measurements of these constructs. Results revealed a significant association between short (biweekly) and long (five week) increases in secure attachment and state mindfulness, and corresponding reductions in symptoms of depression and anxiety. Decreased state avoidant attachment was associated with reductions in both depression and general anxiety, whereas decreased state attachment anxiety was associated with reductions in depression and not general anxiety. Only increased secure state attachment was associated with positive short- and long-term therapeutic changes, whereas increased mindfulness was associated with only short-term changes. A second non-clinical sample showed a slightly different pattern, specifically that increases in state secure attachment and concomitant decreases in state attachment anxiety were predictive of reductions in depressed and anxious mood. Together these results indicate the importance of attachment and mindfulness as agents of change in therapy, especially the importance of reducing avoidant attachment in treating depression, and of increasing mindfulness in treating anxiety. The importance of reducing avoidant attachment seems unique to therapy, as this association was not found in a non-clinical sample.

Dedication

To my loving parents, Dan and Jane, and my sisters, Julia and Lily.

And

To a world filled with love and acceptance.

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Chapter 1

Introduction

Problem Statement

Millions of Americans undergo psychotherapy each year in an effort to heal psychological wounds and disorders, to cope with difficult life transitions, and to live more productive and enriching lives (Wang et al., 2005). There is clearly an implicit assumption in our society today that psychotherapy is effective, and in fact, several meta-analytic studies of therapy outcomes have shown rather conclusively that various modes of therapy are effective in treating psychological maladies (Grissom, 1996; Lipsey & Wilson, 1993; Wampold, 2001, 2010).

However, despite the strong support for the absolute efficacy of psychotherapy (Wampold, 2001), little is known about how and why psychotherapy is effective in treating psychological disorders (Kasdin, 2009). Different schools of psychotherapy have put forth varying rationales for the efficacy of psychotherapy (Day, 2004). For instance, some theorists contend that the therapeutic ritual is the driving mechanism behind successful therapy (Chambless & Ollendick, 2001), whereas others have suggested that the therapeutic alliance is central to therapeutic change (Horvath & Symonds, 1991). Meta-analytic studies comparing the relative efficacy of different treatment approaches, with different rationales as to the underlying therapeutic mechanisms, have found little difference in treatment outcomes (Beutler, 2009; Norcross & Wampold, 2011; Wampold, Imel, & Miller, 2009).

This phenomenon, known as the “Dodo bird effect” (Rosenzweig, 1936), suggests that individual schools of psychotherapy are all effective, but cannot provide clear causal explanations for the effectiveness of their treatment modes. If indeed this is the case, then the underlying mechanism responsible for the beneficial effects of psychotherapy remains unclear. This issue has been the driving force behind an effort for psychotherapeutic integration- the

search for a pantheoretical understanding of how and why therapy works and the mechanisms underlying its effectiveness (Stricker & Gold, 2001). While there is considerable research concerning common aspects of effective therapy, few studies have explicitly examined which client variables best explain differences in therapeutic outcomes (Castonquay, 2000).

The most widely accepted explanation for the Dodo bird phenomenon is the common factors (Frank, 1982), or the contextual model (Wampold, 2001, 2010), which postulates that all modes of therapy share certain common therapeutic elements that account for success in therapy across treatment modalities. Proposed common factors include variables relating to the therapeutic process, to individual characteristics of the therapist, and to the client's expectations for positive therapeutic results. Meta-analytic studies have shown that common factors, such as the therapeutic alliance and therapist skill predict positive therapeutic outcome (Wampold, 2001, 2010). However, these explanations do not thoroughly elucidate what is occurring within the client that leads to the salutary effects (Castonquay, 2000). For instance, it is conceivable that a therapist could employ some bizarre or obscure practice, such as having the client rub a crystal ball, while at the same time maintaining other elements of the common factors model thereby providing a plausible rationale for its effectiveness, providing a healing environment and an associated ritual. This illustrates that although process-oriented common factors are important to therapy – they may not actually explain the source of the positive outcomes achieved by various therapeutic modalities.

Another explanation for the Dodo bird effect may be that the interventions used by various schools of psychology actually may contain underlying therapeutic elements above and beyond the commonalities described in common factors theory. In other words, there may be underlying elements in the therapeutic “rituals” themselves that enhance certain client factors or psycho-social resources within clients and the enhancement of those factors may better explain

therapeutic success than the differing theories posited by the various schools of therapy (Castonguay, 2000). Two psychological constructs, mindfulness and adult attachment, which have both been linked to psychological health and unlike the above described common factors, are internal to the client, may be the missing common factors that can provide a more complete causal explanation across treatment modalities.

Ma (2009) found direct evidence supporting mindfulness as such a common factor. Using students' retrospective accounts of their psychological functioning and level of mindfulness prior to therapy as baseline measures, she found that increases in students' scores on a retrospective post therapy measure of mindfulness, correlated with increases on a measure of psychological functioning. While providing preliminary support for this study's claim, Ma's study relied on students' recall of their psychological health prior to therapy, which may differ significantly from their actual psychological state when they entered therapy.

In the same study, Ma (2009) found an association between changes in a clients' sense of attachment security in relationships and positive changes in psychological functioning. Ma's findings suggest that a movement towards more attachment security, also known as "earned security" (Phelps, Belsky, & Crnic, 1998), is a common factor that can account for changes in psychological health. Again, Ma's study was limited by her data collection method, as it is unclear whether her effect was a result of the students' recall or actual changes in psychological functioning. Despite this limitation, other research supports Ma's findings that adult attachment predicts changes in psychological health, both in clinical and normative samples (Shorey & Snyder, 2006).

This finding was in stark contrast to Pearson, Cohn, Cowan, and Cowan (1994), who found that adults who classified themselves as insecurely attached to their parents when they were children, but later in life became securely attached, had comparable rates of depression to

those who were insecurely attached to their parents both as children and as adults. This study will help to clarify the inconsistencies in the literature.

Ma (2009) also found that mindfulness was a mediating factor between changes in adult attachment and therapeutic outcome. Her findings support the idea that secure attachment and mindfulness are theoretically similar yet separate constructs, a conclusion that is supported by research done by other scholars (Brown, Ryan, & Creswell, 2007; Saavedra, Chapman, & Rogge, 2010; Shaver, Lavy, Saron, & Mikulincer, 2007). This suggests that changes in mindfulness, how one relates to one's own internal experiences, are associated with changes in attachment style – the way a person internalizes his or her relationships with others. The current investigation will go beyond Ma's findings using improved methodology. Specifically, it will employ a time series design to assess clients' levels of mindfulness, attachment, general anxiety, and depression over the course of therapy (in the case of the clinical sample) and over the course of a semester (in a comparison group made of college students). The hypothesis is that improvements in psychological functioning in both samples will correlate with increases in secure attachments and mindfulness, and that there will be a bidirectional association between mindfulness and attachment in their ability to effect change in psychological functioning.

Definitions of Variables

Adult attachment. Refers to how adults perceive their relationships with significant others in their lives. Attachment theory was developed from the work of Bowlby (1982), which was influenced both by his behavioral observations from his work with children, and by psychodynamic and evolutionary theory. Based on their experiences with significant caretakers, children are thought to develop patterns of behavior aimed at maintaining close proximity to their caretakers, behaviors thought to be evolutionarily adaptive in keeping them safe from predators. Ainsworth, Blehar, Waters, and Wall (1978) suggested that those who grow up in

cold, dismissive environments tend to develop defensive, insecure avoidant attachment style. Those who grew up with inconsistent, intrusive caregivers, tend to develop anxious-ambivalent style. Finally, those who grew up with responsive sensitive caregivers will likely develop secure attachment style. Currently, most researchers treat attachment as scores on two orthogonal dimensions – attachment anxiety and avoidance – rather than categories or styles (Brennan et al., 1998; Fraley & Waller, 1998).

Mindfulness. Jon Kabat-Zinn, the creator of Mindfulness Based Stress Reduction (MBSR), defines mindfulness as: “The awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment to moment” (Kabat-Zinn, 2003, p. 145). Mindfulness awareness is a free flowing consciousness state where each internal sensation is observed nonjudgmentally, without either latching onto or avoiding the sensation. In Buddhist traditions, various forms of meditative practices have been used to facilitate mindfulness states, and a variety of current western psychological interventions have incorporated elements from these practices. Baer, Smith, Hopkins, Krietemeyer, and Toney (2006) and Baer et al. (2008) have reviewed current assessments of mindfulness, and based on a factor analysis of the questions regarding mindfulness, have come up with a five factor mindfulness scale with good internal validity which will be utilized in the current work.

Summary

Meta-analytic studies of process research have shown that therapy is indeed effective in improving psychological functioning, yet it is unclear which underlying mechanisms in the therapeutic process are key to effecting psychological change. In what has come to be known as the Dodo bird effect, research comparing different schools of therapy has shown little difference in the overall effectiveness of different modalities. Common factors research has attempted to address this problem by studying similarities across treatment modalities. However, most

common factors research has pointed to process variables rather than specific individual characteristics as the best explanation for the success of therapy. By tracking changes in a clinical population for the first five weeks of therapy and in college students over the course of the semester, this study sought to expand on previous findings (Ma, 2009), using longitudinal methods and the theoretical framework of attachment theory.

Chapter 2

Literature Review

Efficacy of Psychotherapy

As stated in the introduction, there is clear evidence that psychotherapy is effective. Based on extensive analytic studies (Grissom, 1996; Lipsey & Wilson, 1993; Wampold, 2001), researchers estimated a large effect size of between .75 and .85 for the efficacy of psychotherapy. According to Wampold's analysis, those who receive psychotherapy are better off than approximately 79% of those who go untreated; receiving treatment accounts for 14% of the variance in outcome; and the success rate for those receiving treatment is 69% compared to 31% for those untreated.

Although the evidence regarding therapy's effectiveness seems clear, little is known about how and why therapy works. A potential reason for this is the lack of a coherent and linear explanation for psychological disorders, which in turn hampers the ability to compare the efficacies of different treatment modalities and the source of their success (Wampold, 2001). Different schools of therapy offer different explanations to the etiology of psychopathology and the corresponding mechanism of therapeutic change (Day, 2004). For example, cognitive therapies (Warmerdam, van Straten, Jorgsma, Twisk, & Cuijpers, 2010) assume that psychological disorders stem from maladaptive patterns of thinking that lead to negative emotions and behavior. Psychodynamic theories (Coleman, Cole, & Wuest, 2010), in contrast, assume that psychological disorders are caused by relational problems with primary caregivers in childhood and that re-examining these early patterns and understanding how they influence one's current behavior can facilitate the reshaping of affective/behavioral repertoires.

If one of those theories would have accurately identified the cause of the problem and a corresponding solution, then comparative studies of psychotherapy would show consistently superior results for that approach as compared to other psychotherapies (i.e. behavioral, psychodynamic, gestalt) (Wampold, 2001). The research, however, does not support this option. Wampold (2001) analyzed multiple meta-analytic studies of treatment outcomes and estimated a .2 effect size (a small effect size in social science research) (Cohen, 1992) for the type of treatment administered as a predictor of therapeutic outcomes. He estimated that only 1% of the variance in outcome is due to the type of treatment. This finding indicates that therapy is effective not because of the therapeutic explanation provided by the various school of therapy, but rather some elements common to all major schools of therapy.

Rosenzweig (1936) famously publicized the view that all major psychotherapeutic theories produce similar results. In his 1936 article, Rosenzweig called this phenomenon the “Dodo bird effect” based on a line in Lewis Carroll’s novel, *Alice in Wonderland*. Several characters became wet and the Dodo bird set up a competition where all were to run around the lake until they were dry. However, since no one calculated how far each had run or for how long, when the Dodo was asked who the winner was, he said, "Everybody has won and all must have prizes." (Rosenzweig, 1936, p. 412). In other words, like in *Alice in Wonderland*, all treatments are equally good.

Attempts at addressing the Dodo bird effect problem by integrating psychological theory have taken three main approaches: 1) Eclecticism or technical eclecticism, which seeks to utilize interventions according to the specific needs of the client; 2) Theoretical integration, which attempts to combine two or more theoretical approaches into a more complex and thorough understanding of psychopathology and the process of therapeutic change; and 3) The common factors approach, describes commonalities across treatment modalities in order to encourage

therapists to emphasize those aspects of the therapeutic process that seem to be the most predictive of therapeutic success.

Technical eclecticism is based on the idea that specific interventions from across theoretical perspectives should be chosen according to both the characteristics of the client (personality, psychological history, psychopathologies) and those of the therapist. This idea was expressed clearly in Paul (1967), who asked: “What treatment, by whom, is most effective for this individual with that specific problem, and under which set of circumstances?” Although, in theory, this idea seems promising, researching technical eclecticism is a daunting task as the complexity of the therapeutic process requires researchers to examine an exponentially large matrix of variables (Lampropoulos, 2000). Current research on the subject has produced mixed results with some studies supporting the idea (Beutler, 1999) and others showing disconfirming results (Lampropoulos, 2000).

Theoretical integration is an effort to combine aspects from multiple theories in order to provide a richer conceptualization of the client, his psychopathology, and stage of therapeutic change. Proponents argue that integrating several techniques may lead to a blend of two orientations that will be more sophisticated and effective than any single theory alone, while skeptics claim that theoretical integration is overly optimistic and that philosophical and scientific gaps between disparate theories prevent their accurate and useful integration (Frank, 1982). Frank outlined the commonalities between different schools of psychotherapies. He suggested that psychotherapy and other cross cultural healing practices share four common elements:

1. They occur within emotionally charged relationships with a caring healer;
2. They occur within a societally sanctioned healing setting;

3. There is a rationale as to the nature of the problem (DSM diagnosis, psychological theories, etc.); and
4. They provide a ritual that is carried out by the patient with the support of the therapist that is believed, by both client and therapist, to have the capability to increase psychological health.

In essence, Frank was arguing that the so-called “placebo effect”- the tendency for a control treatment or drug to produce the desired effect because of the participant’s expectation that it will work – is the main ingredient of therapeutic change. Good therapists, in Frank’s view, are those who are best able to implement the effects of the placebo by convincing their clients of the merits of their theory, and the benefits of their chosen ritual.

Wampold (2001) presents evidence for what he describes as the contextual model of psychotherapy, which posits that the key mechanism behind therapeutic change is the context of therapy rather than specific elements of a particular theoretical model. Wampold’s model is subtly different from Frank’s common factors model, in that while Frank attributes therapeutic success directly to the implementation of certain specific common factors, Wampold believes that successful therapy occurs because of the overall therapeutic context, the key to which is the client’s belief that he will get better. Moreover, unlike Frank (1982) who based his common factors model on theory alone, Wampold (2001), has compiled empirical evidence supporting three contextual factors that predict therapeutic outcomes:

- 1) The working alliance between therapist and client;
- 2) The therapist’s allegiance to the specific treatment modality; and
- 3) Therapists with higher skills produce better outcomes.

Each of these factors is explored below.

The term *working alliance* originates from psychoanalytic theory, and denotes a client's healthy, caring, and trusting feelings towards a therapist, in contrast to neurotic interpersonal tendencies (transference). Recent pantheoretical definitions focus on four discrete components of this alliance: (a) emotionally charged relationship between client and therapist; (b) the client's willingness to work collaboratively with the therapist; (c) the client's perception of the therapist as empathetic and caring; and (d) the degree to which the therapist and client agree about goals for therapy (Wampold, 2001).

Meta-analytic studies by Horvath and Symonds (1991) and Martin, Garske, and Davis (2000), found that working alliance accounted for a significant amount of the variance in therapeutic outcome. Horvath and Symonds (1991) analyzed 20 studies of outcome and working alliance and found a .54 effect size, indicating that working alliance accounts for 7% of the variance. Similarly, Martin and colleagues analyzed 60 studies and found an effect size of .45, indicating that working alliance accounts for 5% of the variance in therapeutic outcome.

The therapist's allegiance addresses the strength of a therapist's belief in the method they are using with a client. Within community populations, allegiance may not vary greatly between therapists, as it is generally assumed that therapists will choose treatment models that fit with their own beliefs about mental illness and therapeutic change. Allegiance effects are a bigger issue within clinical trials, where therapists in a control group or a "treatment as usual" context may find themselves practicing a modality in which they do not really believe in order to provide a comparison for the intervention that is believed to be more effective. Wampold (2001) estimates that therapist allegiance to a treatment model accounts for up to 10% of the variance in treatment outcomes with effect sizes as high as .65.

Therapist effects refer to the degree of variation in outcome between different therapists depending upon their individual skill and ability. Those who ascribe to what Wampold (2001)

refers to as the “medical model”- the view that therapeutic outcomes are the direct result of the therapeutic intervention- believe that differences in outcomes should not vary significantly between therapists, assuming that therapists are adequately trained in delivering the specified treatment (usually through strict adherence to treatment manuals); however, the empirical evidence does not support this view. Wampold (2001) aggregated data from several meta-analytic studies and estimated that between 6-9% of the variance is accounted for by therapist effects, with effect sizes ranging from .50 to .60. These findings indicate that therapists differ in effectiveness and that these differences are very important for therapeutic outcome. It is still unclear, however, what factors make one therapist more effective than another.

Grencavage and Norcross (1990) did a meta-analysis of 50 studies of common factors using a coding system and reported 89 different common factors proposed by the authors. Of these, the majority (41%) related to change process factors, the most frequently cited being “opportunity for catharsis/ventilation,” “acquisition and practice of new behaviors,” and “provision of a rationale for the client about her current symptoms.”

The second most common category was therapist variables (24% of all the common factors cited); and of these the most commonly cited ones were general positive descriptors, such as being empathetic and genuine and having the ability to cultivate hope and enhance expectancies. Common factors relating to the client accounted for 6% of the factors cited, and were only cited by 30% of the authors. The most common client variable cited was the client’s expectation, hope, or faith in the therapeutic process – in other words, the placebo effect.

These reviews indicate that while much is known about commonalities in treatment processes and the characteristics of therapists who deliver them, little is known, empirically, about the internal characteristics of the client during successful therapy. Castonguay (2000) argues that the lack of research on client variables creates a major theoretical problem for

common factors advocates in that process and therapist common factors cannot provide a plausible link between the etiology of a clinical disorder and the type of intervention delivered. While Castonguay is in agreement with common factors theorists that process-oriented common factors (working alliance) and therapist characteristics (empathy) are important to the process, he does not believe they are sufficient to account for therapeutic change. Furthermore, he stresses the practical problems that result from training therapists according to the common factors theory, while ignoring client-related factors.

In line with Castonguay's emphasis on the need for more research on client-oriented common factors, Tallman and Bohart (1999) and Hubble, Duncan, and Miller (1999) summarized decades of research suggesting that therapeutic outcome is client driven. The authors argue that clients have innate capacities for both self healing and real life problem solving, and that these capacities lead to growth, both in therapy and in real life.

Challenging the medical model's conception of mental health as the imparting of wisdom from knowledgeable therapist to helpless client, Tallman and Bohart presented scientific evidence for the efficacy of self-help books and computer based therapy, and for the phenomenon of spontaneous recovery. Tallman and Bohart characterize therapists as skilled consultants who collaborate with their clients to develop the clients' own creative capacity to solve life's problems and to heal. Miller (2008) has argued for the utilization of practice-based evidence, in which the therapist continually assesses the client's self reported functioning, using an analogue scale of individual, interpersonal, social, and overall well-being, as well as client feedback on therapist performance- using an analogue scale of the relationship, goals, approach/method, and bond. Miller has provided empirical support for his client-centered approach, and has argued that it works by helping the therapist to facilitate the client's own creative capacity for growth.

While Miller and colleagues have provided compelling evidence for client generated outcome, they have not answered Castonguay's concerns regarding the lack of a direct link between the etiology of a clinical struggle and processes internal to the client that accounts for positive therapeutic change. The authors use words such as "creative" to describe the process, but do not provide a testable construct that would allow researchers and therapists to study or attempt to understand this creative process.

Following Miller et al. (1999) and Tallman and Bohart's summary of outcome research and Castonguay's call for a more defined explanation as to how client driven processes produce therapeutic outcome - the current work focuses on two such psycho-social factors – adult attachment and mindfulness. Below, the literature is reviewed supporting the potential role of these factors as client-related common factors which contribute to successful therapy.

Attachment Theory

Attachment theory emerged from John Bowlby's observations of the behaviors of children separated from their mothers at the Tavistock Clinic in London, where he worked as a family clinician during World War II (Mikulincer & Shaver, 2007). Bowlby (1969, 1982) noticed that children who were separated from their mothers for long periods of time during treatment, which was common at that time, displayed a distinctive progression of behaviors following the separation. Immediately after the separation, children tended to vehemently protest their caregiver's absence by such actions as crying, screaming, and having temper tantrums. In the second stage, children became despondent and emotionally withdrawn and gave up trying to find their caregiver. In the final stage, those who were not reunited with their caregivers began to resume normal activities and to act in a more self-reliant and independent manner. Bowlby used these observations, along with prior research, to develop a theory of attachment that borrowed

from several existing psychological theories, including psychoanalytic theory, ethology, evolutionary theory, control systems theory, and Piaget's theory of development.

Bowlby (1969, 1982) conceptualized attachment as one of several evolutionarily adaptive behavioral systems. Each system includes a behavioral feedback loop in which certain behaviors are triggered by an environmental stimulus and the behavior is subsequently deactivated when the level of the stimulus shifts below a certain threshold (Mikulincer & Shaver, 2007).

According to Bowlby, the attachment behavioral system developed in order to ensure that infants remain in close proximity to their caregivers in order to receive the support they need to survive. Each of the stages Bowlby described fits neatly into evolutionary theory. For instance, the child's yelling and crying when first faced with separation may have functioned to elicit immediate proximity to a caregiver, while the quiet, subdued behavior characteristic of the second stage, may have decreased the likelihood of attracting predators.

Bowlby believed that the early attachment experience between infants and caregivers was crucial in shaping a child's subsequent relationships. Children develop internal representations of both themselves, as loveable or unlovable, and of their caregivers (which Bowlby named attachment figures) and the world in general, as either trustworthy or untrustworthy. These internal working models then function as a template for how an individual will navigate their environment, in particular with regard to relationships. Bowlby contended that these internal working models, though highly influenced by early attachments with primary caregivers, are dynamic and subject to adjustments throughout one's life.

Ainsworth, Blehar, Waters, and Wall (1978) extended Bowlby's concept of attachment by studying infants both at home and in the laboratory using the *Strange Situation Procedure*. In it, they systematically studied the behavioral reactions of infants separated from their mothers. Using that procedure, Ainsworth et al. (1978) identified three distinct behavioral patterns

commonly displayed by infants and used those to group the infants into three groups: 1) Group A, anxious avoidant attachment (avoidants for short); 2) Group B, secure attachment (secures for short); and 3) Group C, anxious ambivalent attachment (anxious for short).

Anxious and avoidant infants tend to cry more and display less secure behaviors -such as hugging and kissing - than secure infants. Avoidant infants showed less distress after their mother's departure and were less likely to seek out their mother upon her return, compared to both the secure and the anxious infants. The anxious infants, on the other hand, were more apt to cling to their mother upon her return and to be inhibited in their play, as their primary focus was on maintaining proximity to their caregiver.

Analysis of interactions between children and their mothers at home showed that mothers of avoidant children are more likely to reject their babies' needs, or to respond to them aversively (Ainsworth et al., 1978). Mothers of anxious children tended to be more inconsistent in their responses, responding sensitively in some circumstances, but ignoring their children or acting harshly in others. Ainsworth, in line with Bowlby's (1969) theory, hypothesized that avoidant children used deactivating strategies to maintain proximity to caregivers while maintaining distance in case their caregiver were to act aversely (expressing anger, using verbal or physical reprimands). Anxious children, on the other hand, used hyperactivating strategies to ensure that they got the support they needed.

Although Bowlby theorized that attachment was an important part of functioning "from the cradle to the grave" (Bowlby, 1969/1982, p. 208), it was not until the 1980's that adult attachment came to be studied directly. Hazan and Shaver (1987) were among the first to conceptualize romantic love or pair bonding as an attachment process similar to the attachment between mother and infant, contending that similar biological underpinnings underlie both infants and adults attachment system and processes. They also suggested that individual

differences in adult attachment styles are similar to differences in infant attachment styles and are related to past attachment histories. Following their conceptualization, hundreds of studies were done, showing that attachment plays a central role in adults' close relationships and that attachment style is a central predictor relevant to close relationships, and also to emotion, emotion regulation, and associated behaviors (see Cassidy & Shaver, 2008; Mikulincer & Shaver, 2007 for reviews).

For example, Collins and Read (1990) found in a series of studies done with college undergrads, that students with more secure attachment styles reported more satisfaction within romantic relationships. In a related study, Davila and Kashy (2009), found that securely attached partners expressed more supportive behaviors than their insecure counterparts.

Simpson (1990) found attachment within romantic relationships predicted levels of positive and negative affect. Specifically, he studied 144 dating couples, and found that securely attached individuals experienced more positive and less negative affect within their relationships than those who were less securely attached.

Of relevance to this current study, Rice, FitzGerald, Whaley, and Gibbs (1995), found that students self-reporting high attachment security during their freshmen year of college, predicted high levels of academic and emotional adjustment during their junior year. Even more specific to this study's hypothesis, Lopez, Mauricio, Gormley, Simko, and Berger (2001), found that within a sample of 55 college undergraduates, higher scores on secure attachment, using the Experience in Close Relationship (the measure used in the current study), predicted lower rates of self-reported depression and anxiety.

Earned Attachment Security

Despite seemingly grim prospects for those with insecure attachment styles, evidence suggests that even insecurely attached people can become secure (at least temporarily) and

benefit from this state of security. There are different ways in which this process can happen. For example, people can go through a priming process and gain a temporary sense of security.

Mikulincer and Shaver (2007) reviewed various studies showing that secure attachment can be primed during short-term laboratory experiments by exposing people to attachment related words or images. Along with increasing feelings of attachment, short-term laboratory induced security priming has been shown to have a positive influence on other psychological variables including mood, death anxiety, aggression, body image distortions, and symptoms of PTSD (Gillath, Selcuk, & Shaver, 2008).

Moreover, several researchers have found that security primes can have long-term effects. Dandeneau, Baldwin, Baccus, Sakellaropoulo, and Pruessner (2007) found that students who completed a cognitive task of clicking on smiling/accepting faces in an array of negative faces for five consecutive days before an exam reported less stress before and after the exam than a control group that completed a neutral task. Dandeneau et al. (2007) also found that telemarketers in an experimental group who completed the same friendly face prime reported experiencing less stress and higher self-esteem than a control group. Gillath et al. (2008) found that security primes given every other weekday for three consecutive weeks resulted in increases in self-esteem, positive mood, and compassion for up to a week after the final primes were given. These findings suggest that secure attachment can be developed through repeated security enhancement.

A related line of research provides evidence on similar changes in one's attachment style through therapy (e.g., Davila, 2003). People who grew up as insecure individuals, or who became insecure due to various life events, can transition into security via therapy or repeated interaction with a security-providing attachment figure, ending up with "earned security" (Mallinckrodt, 2010). According to Davila (2003) and others (Levy et al., 2006; Mikulincer &

Shaver, 2007; Travis, Bilwise, Binder, & Horne-Moyer, 2001; Mikulincer & Shaver, 2007), similarly to priming, repeated experiences can potentially reprogram people's internalized working models and make the secure attachment figures more salient as compared with the insecure figures. This suggests that a reason that therapy is effective may be because of its ability to enhance attachment security.

Approaching the subject from a neuropsychological perspective, Cozolino (2010), ties psychotherapy to the epigenetic hypothesis of human development, which posits that early psychological development is an interaction between the behavior of caregivers and the child's genetic predispositions (Big Five personality and temperament). Therapy from this perspective works by the rewiring of neuronal connections related to maladaptive cognitive, emotional, and behavioral patterns. More specifically Siegal (2007), describes the mirror neuron system as a mechanism used by therapists both to become attuned to the emotional and interpersonal needs of their clients, and to help their clients to develop similar capacities. While neither Siegal nor Cozolino use the word attachment in their work, it seems evident that their work describes similar, if not identical, processes.

The idea that attachment is important in therapy has received support throughout the years from different theoretical perspectives. Freud, the father of both clinical psychology and psychoanalytic theory, was the first to postulate that mental disorders stem partly from problems in attachment between a child and his primary caregivers. While modern psychodynamic and interpersonal theorists have modified Freud's emphasis on attachment related to early psychosexual development, most still hold the view that mental disorders are interpersonal at their core and that the therapists' ability to form and model secure therapeutic relationships with their clients is one of the keys to therapeutic change (Wallin, 2007). As Bowlby (1982, p. 140) so

eloquently put it: “the therapist role is analogous to a mother who provides her child with a secure base with which to explore the world.”

Despite this theoretical connection, to date, there has been a dearth of research explicitly examining attachment as the catalyst for therapeutic change. Common factors research and writings by theoretical integrationists and technical eclectists (Lampropoulos, 2000) suggest that changes in attachment patterns or styles may be an important ingredient of effective therapy as all therapies involve building a relationship between therapist and client (Frank, 1982). Little research, however, was done to directly test these claims, especially while taking into account the client’s attachment style. Below this research is reviewed and highlights gaps in existing literature.

Attachment and Therapeutic Outcomes

Effects of Attachment Style. Most research on the role of client attachment style in predicting therapeutic outcome suggests that attachment security is a central component in the success of therapy. For example, Mosheim et al. (2000) studied 65 patients diagnosed with psychosomatic disorders and found that secure attachment, but not anxious or avoidant attachment, predicted self-reported therapeutic goal attainment. Meyer, Pilkonis, Proietti, Heape, and Egan (2001) studied 149 patients with affective and substance abuse disorder, and like Mosheim et al. (2000), found that secure attachment predicted greater relative improvement in global functioning than did avoidant or attachment anxiety.

Although most studies support the role of attachment security in successful therapy, the findings are somewhat complex. Recently, McBride, Atkinson, Quilty, and Bagby (2006) randomly assigned 56 individuals diagnosed with major depressive disorder to one of two treatment groups: an interpersonal therapy group or a cognitive behavioral therapy group. Consistent with prior therapy outcome research, both modalities significantly reduced depressive

symptoms (measured with Beck's and Hamilton's self report depression inventories), but neither modality significantly outperformed the other. Hierarchical linear models showed that those with higher levels of pre-therapy avoidant attachment achieved greater reductions in levels of depression than those with lower pre-therapy avoidant attachment, while the level of pre-therapy attachment anxiety was not related to outcome. Individuals with higher levels of avoidant attachment also responded better to cognitive behavioral therapy than they did to interpersonal therapy. This study highlights the importance of attachment styles to therapeutic outcomes and suggests that certain types of therapy may be more beneficial for those with certain attachment styles.

Changes in Attachment During Therapy. In what they described as the first study to examine the effect that changes in attachment have on therapeutic outcome, Travis et al., (2001) examined the effect of changes in adult attachment that occurred within a clinical sample of 29 participants, the majority of whom had been diagnosed with both Axis I and Axis II disorders. They found that a significant number of the participants earned security. That is, clients moved from insecure to secure attachment over the course of treatment. Travis et al. (2001) found that those who entered the study with higher secure attachments also had lower levels of distress; however, they did not find a significant association between increases in secure attachment levels and reductions in anxiety, depression, or problems in interpersonal functioning over the course of the study.

Levy et al. (2006) randomly assigned 90 adults diagnosed with Borderline Personality Disorder to one of four, year-long treatment groups: a transference-based psychotherapy group, an intensive, relationship based therapy (designed specifically for borderline personality disorder); a dialectical behavior therapy group; or a supportive psychodynamic therapy group. The authors found a significant number of clients moved from insecure to secure attachment

styles in the transference-based psychotherapy group, but not in the other two treatment groups. The authors did not specifically examine the association between changes in attachment and therapeutic outcome. They did, however, argue for the importance of attachment in therapy and called for further research to examine attachment as a possible mechanism for positive therapeutic change.

Using Attachment in Therapy. Emotionally Focused Couples Therapy (EFT; Johnson, Hunsley, Greenberg, and Schindler, 1999) is a couple's therapy that explicitly uses attachment theory as the basis for therapeutic interventions. The EFT therapist first helps clients identify problematic interactions that maintain and foster insecure attachment styles, and then assists them in forming new interaction styles focused on expressing their emotional needs and engaging in supportive behaviors aimed at forming a more secure bond with their partners. Johnson et al. (1999) conducted a meta-analysis of results from nine clinical trials on EFT between 1985 and 1997. The authors found significant reductions in the Dynamic Adjustment Scale, the most widely used measure of relationship functioning in the literature. While the authors did not explicitly study the effects of attachment as a predictor of outcome, the success of EFT, an explicitly attachment-based modality, supports the positive role of attachment in producing favorable outcomes in couple's therapy.

Ma's (2009) unpublished dissertation is the only study to specifically examine changes in adult attachment as a mediator of therapeutic change over the course of therapy. Ma sampled 90 college students over the age of 18 and who ended psychotherapy within six months of her study. She found that when students retroactively recalled their pre and post levels of attachment and psychological functioning, changes in the recalled attachment scores mediated the changes in psychological functioning. Specifically, self reported increased attachment security was associated with increases on a global scale of psychological functioning. As discussed in the

introduction, Ma's study suffered from various shortcomings, most notably the fact that her data collection was not done concurrently with the therapy. This study improves upon her methodology in that daily assessments were collected concurrent with therapy.

The Origin of Mindfulness

Mindfulness is a consciousness state that tends to accompany the practice of meditation (Kabat-Zinn, 2003). Although originating in eastern traditions, recently Western science has focused its attention on mindfulness meditation. For example, neuroscientists have found significant positive neural changes in mindfulness meditators (Creswell, Way, Eisenberger, & Lieberman, 2007; Vestergaard et al., 2009). Creswell and colleagues (2007) found that those trained in mindfulness meditation had increased neural activity in the prefrontal cortex, the part of the brain associated with higher order thinking, and decreased activity in the amygdala, the area of the brain associated with uninhibited emotional expression. Vestergaard and colleagues (2009) found that long-term meditators had permanent positive neurological changes, including higher gray matter density than comparable non-meditating populations.

Especially relevant to the current work, psychologists have recently incorporated the practice of mindfulness into western psychological practices (Baer, 2003). In 1979, Kabat-Zinn developed his MBSR course at the University of Massachusetts Medical Center in order to treat clients with chronic medical conditions. Kabat-Zinn trained in both biology and Zen Buddhism, but had no formal training in psychology, and therefore his MBSR program was based on a physiological rather than a psychological framework. The program combines mindfulness meditations and experiential activities with yoga and movement and was the first unified mindfully based intervention. For the past three decades, MBSR has been effective in treating a variety of physiological and psychological disorders (Dryden & Still, 2006; Germer, 2005; Kabat-Zinn, 2003). Currently there are many treatments based on mindfulness such as:

Dialectical and Behavioral Therapy (DBT), to treat borderline personality disorder (Linehan & Dexter-Mazza, 2008); Mindfulness Based Cognitive Therapy (MBCT), for depression (Segal, Williams, & Teasdale, 2002) and Acceptance and Commitment Therapy (ACT) used to treat a variety of disorders (Hayes, Strosahl, & Wilson, 2003).

Mindfulness as a Common Factor

Martin (1997) has argued that mindfulness is a common factor underlying all successful therapy, regardless of the therapists' theoretical orientation. Although his work is strictly theoretical, he provides a clear and plausible explanation as to how and why mindfulness is associated with positive therapeutic change. According to Martin, therapists, by necessity, act mindfully when they empathetically and non-judgmentally help their clients view their lives and circumstances differently in order to bring about positive change. Similarly, the process of change within the client also requires mindful awareness. By engaging in the process of deautomatization- using meta-cognitive processes to step back from one's problems- the clients invariably become more aware of the constellation of cognitions, behaviors, and emotions that have been pervading their conscious awareness, and thereby gain the power to consciously control their experiences.

Martin (1997) distinguishes between the type of mindfulness utilized in more directive modalities such as cognitive and behavioral therapy, from that used in less directive, more insight based therapies, such as psychodynamic and humanistic-existential. Martin argues that more directive therapies use concentrative meditation techniques, such as focused attention, to shift the client's focus from maladaptive cognitive and behavioral patterns to more adaptive client-generated thoughts and behaviors. Less directive therapies, on the other hand, use mindfulness (or a more open experiential awareness) to help clients view their problems through a broader lens. In psychodynamic therapy, clients employ the technique to gain insight into the

connection between past and current experiences. In humanistic-existential therapy, mindfulness is used to help clients to understand that their view of the world is ephemeral and socially constructed, and that by controlling their focus and attention they can increase their ability to choose how to live their lives.

What all of these approaches have in common, according to Martin (1997), is their facilitation of clients' mindful awareness of their current life situation, which fosters an ability to more intentionally control the contents of their awareness. Martin stresses that Eastern meditative traditions seem to recognize the distinction between concentrative (directive) techniques, in which participants focus on a single stimulus in their environment, such as the breath or a mantra, and mindfulness (insight) meditation which requires the meditator to attend equally to all aspects of his environment, noticing, but not becoming attached to, any one single stimulus.

Mindfulness has been linked to increases in several measures of positive psychological health, including: levels of psychological well-being (Carmody & Baer, 2008), an increase in cognitive flexibility (Moore & Malinowski, 2009), a decrease in levels of psychological distress (Carmody & Baer, 2008; Coffey & Hartman, 2008), a decrease in levels of anxiety (Carmody et al., 2008; Evan et al., 2007) and decreases in depressive symptoms (Carmody et al., 2008; Chambers, Lo, & Allen, 2008). In addition, several new empirically supported therapeutic treatments explicitly utilize mindfulness as a therapeutic intervention and were shown to be effective in treating a variety of psychological maladies (Baer et al., 2006).

While mindfulness-based interventions have shown success in reducing psychological distress, only a handful of studies have specifically examined mindfulness as the mechanism underlying these reductions (Harnett et al., 2010). Brown and Ryan (2003) found that pre-post increases on a self-report mindfulness measure mediated the association between receiving a

modified MBSR treatment, and decreased depression and anxiety. Additionally, Carmody and Baer (2008) found that increases in mindfulness mediated the association between the self-reported practice of MBSR mindfulness techniques outside of class and reductions on a global measure of psychological distress. Similarly, Harnett et al. (2010) taught a three-session mindfulness based class to a non-clinical community sample and found that of those participants reporting significant reductions in depression and anxiety, all but one had significant increases in mindfulness scores. Carmody et al. (2008) found that within a clinical sample, reported reductions on a global scale of psychological distress were associated with increases on a measure of mindfulness. Lastly, Kumar, Feldman, and Hayes (2008), in a study of new Exposure-Based Cognitive Therapy for depression, which included mindfulness training, found that pre-post trait changes in mindfulness (measured with the CAMS as in the current study) predicted a downward trajectory of depressive symptoms, measured weekly using the Beck Depression Inventory. In their limitation section, the authors explicitly addressed the need for further research examining both mindfulness and depression over the course of treatment, to allow for a more sophisticated understanding of how these constructs change together over the course of therapy.

To date, Ma's (2009) dissertation has been the only study to specifically examine mindfulness as a mechanism of change across treatment modalities. Ma asked a sample of students to retrospectively recall their psychological states before and after therapy and she found a significant correlation between those who recalled a reduction in psychological distress and those who recalled increases in mindfulness. To date, no research has used self-report measures concurrent with psychological treatment to examine mindfulness as a common factor across treatment modalities. In addition, all prior research on the role of mindfulness as an agent of therapeutic change has only examined the association between pre-post changes in

mindfulness and psychological outcomes. This study will be the first to examine how changes in mindfulness relate to changes in psychological functioning, not merely from pre to post, but throughout the course of therapy. It will also be the first to examine mindfulness as an agent of therapeutic change using different treatment approaches within the same study.

Mindfulness and Attachment Security

The growing interest in both mindfulness and attachment in relation to mental health has led researchers to examine similarities between the two constructs. For instance, mindfulness and secure adult attachment have been linked to the same positive outcomes including mental and physical health, better relationships, more adaptive coping with relational and life stressors, and better self-regulation (Ryan, Brown, and Creswell, 2007; Shaver, Lavy, Saron, & Mikulincer, 2007). Furthermore, neurological studies have found similar neural pathways for mindfulness, emotional self-regulation, and secure attachment (Gillath, Bunge, Shaver, Wendelken, & Mikulincer, 2005; Shaver et al., 2007; Siegel, 2007). Both mindfulness and attachment security relate to increased activity in the medial frontal lobes, an area of the brain associated with both emotional and behavioral regulation, and higher order thinking (Creswell et al., 2007; Siegel, 2007; Vestergaard et al., 2009).

More specifically, EEG and fMRI studies on attachment have measured neural activity of participants engaged in a relational and/or emotional stimulation task. Participants with insecure attachment styles have been found to have lower rates of activation in the prefrontal cortex, particularly in the left prefrontal cortex, which is the area of the brain associated with positive affect and adaptive approach behaviors (Cohen, & Shaver, 2004; Dawson et al., 2001; Gillath et al., 2005). Neuropsychological studies on mindfulness have typically used EEG and fMRI technologies to measure the brain activity of meditators during meditation and/or to compare the neural activity of groups trained in meditation with untrained groups, during cognitive tasks or

emotional activation (Creswell et al., 2007; Farb, Anderson, Bean, McKeon, Mayberg, & Segal, 2010). While the research on the neural correlates of both mindfulness and attachment is relatively new and more research is needed to fully understand the complex nature of these constructs, the existing research suggests that both mindfulness and secure attachment are associated with neural structures that govern executive functioning, attention, and emotional regulation (Siegel, 2007). Siegel (2007), postulates, based on prior research and theory, that mindfulness and what he describes as attunement (a process he relates directly with secure attachment) are identical processes in that making a deep connection with another person through mirror neurons is the same neural process as deeply connecting to oneself through self-reflection and mindfulness.

Attachment security and mindfulness may, in fact, have related theoretical origins. For instance, Fonagy's (1996) "mentalization" construct, which emerged from his work in attachment, and is defined as the ability to notice and articulate one's own feelings, needs, and thoughts, as well as those of one's partner, is conceptually similar to two of the five mindfulness factors: (a) *observing and noticing*, and (b) *describing and labeling*, identified by Baer et al. (2008) in their factor analysis. Fonagy and Target (1997), describe the importance of early attachment bonds with caregivers in the development of later abilities for self reflection and self organization- the ability to integrate physical, emotional, and cognitive experience into a coherent self concept.

In line with these ideas and conceptualization of attachment and mindfulness, Ma (2009) found that mindfulness partially mediated the association between increased secure attachment and psychological functioning (the association displayed in Figure 1). Her results indicate that over the course of therapy, increases in secure attachment lead to higher levels of mindfulness and increases in mindfulness contributes to healthier psychological functioning. The current

study will examine mindfulness and attachment as bidirectional processes that develop simultaneously and synergistically to affect therapy's success (Ryan et al., 2007). This proposed association between mindfulness, attachment, and psychological functioning (as measured by levels of depression and anxiety) is displayed in Figure 3.

Summary

Therapy has been shown rather conclusively to be effective in treating a wide variety of psychological problems; it is still a matter of debate, however, as to how and why it is effective. Specifically, little is known about the processes that occur within the client to affect therapeutic success. Two theoretical constructs – adult attachment and mindfulness – representing inner processes, are known to associate with positive psychological health. The current work will test these factor's role as common factors within the client that could provide an explanation for therapeutic change across treatment modalities. Although preliminary research supports these ideas (Kumar et al. 2008; Ma, 2009), neither factor has been studied explicitly as a common factor over the course of therapy or across treatment modalities. The current research will overcome this gap in the literature.

Chapter 3

Statement of Problem

As discussed in the previous chapters, despite considerable research to support the efficacy of psychotherapy (Grissom, 1996; Lipsey & Wilson, 1993; Wampold, 2001, 2010) there is no conclusive evidence regarding the mechanism of change explaining why and how therapy works. The current work will determine whether attachment and mindfulness, two psychological constructs that have been consistently linked to psychological health and have been incorporated into several specific treatment modalities, might provide an answer as to the question of why therapy consistently works across treatment modalities.

It is hypothesized that over the course of therapy, increases in state mindfulness and state attachment will be associated with decreases in depression and general anxiety. These associations will be examined through two lenses, using hierarchical linear and linear regression modeling. The first will look at the association between biweekly changes in state mindfulness and attachment (measured over three to four day periods) and corresponding changes in state general anxiety and depression over those same time periods. This will allow us to infer both whether therapy is an association between increasing mindfulness and secure attachment over small periods of time, and whether those changes correspond to similar reductions in psychological symptoms, specifically depression and general anxiety. Secondly, the association will be examined between gains in state mindfulness and state attachment, and reductions in psychological symptoms over the course of the entire five-week study, which will elucidate whether the positive effects of increases in state mindfulness and state attachment on psychological symptoms last for extended periods of time.

It is also hypothesized that, as found by Ma (2009) mindfulness will partially mediate the association between security and general anxiety and depression. The study will examine this hypothesis using a time series design rather than clients retroactive recall. In addition, this study will attempt to determine whether the association between state attachment and mindfulness with respect to decreases in psychological symptoms, may be bidirectional, and that changes in state attachment (biweekly), may partially mediate the association between increased state mindfulness and decreased depression and general anxiety. This hypothesis is in line with the bidirectional association thought to exist between mindfulness and attachment (Ryan et al., 2007).

The third hypothesis is that the expected association between small changes in state mindfulness and attachment (biweekly), and state depression and general anxiety will relate to pre-post trait changes in depression and anxiety. This hypothesis suggests that therapy induced increases in state mindfulness and state attachment will lead to long term trait changes in functioning.

Lastly, this study will examine whether the associations between short and long term increases in state mindfulness and attachment, and improved psychological functioning, also hold for a normative sample of college students not involved in therapy or any other psychological intervention. Then it can be inferred how therapy may uniquely influence the association between mindfulness, attachment, depression and general anxiety over time. The hypotheses of the study are described more specifically below.

Hypotheses for the Therapy Study

Hypothesis I. *There will be pre-post (trait) reductions in levels of depression and general anxiety, and pre-post gains in levels of mindfulness and secure attachment.*

This first hypothesis is meant to verify that these data replicate prior research on pre-post increases in mindfulness (Carmody and Baer, 2008; Carmody et al., 2008; Harnett et al., 2010; Ma, 2009), and attachment (Levy et al., 2006; Travis et al., 2001) over the course of therapy. Even with this study's small sample sizes, there was an expectation to find both reductions in trait depression and general anxiety, and increases in levels of mindfulness and secure attachment.

Hypothesis II. *Changes in state mindfulness and state attachment will predict changes in psychological functioning.*

- a. *Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in depression above what is accounted for by fluctuations in clients' perceptions of daily events (good and bad).*
- b. *Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in general anxiety above what is accounted for by fluctuations in clients' perceptions of daily events (good and bad).*
- c. *Overall changes in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in depression over the same time period.*
- d. *Overall changes in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in general anxiety over the same time period.*

The purpose of testing these hypotheses was to determine the degree to which increases in mindfulness and attachment correspond to reductions in state depression and general anxiety over the same time period. The associations between these variables were tested both over 3-4 day periods, and over the course of the five week study. Testing the association of these variables

over different time periods allows us to understand how these constructs change over time.

Because this study is the first to examine daily fluctuations in mindfulness, attachment, depression and general anxiety, no theoretically based deductions can be made as to how the associations between these variables may change over time.

Hypothesis III. The association between short-term changes in attachment styles and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in mindfulness.

- a. The association between biweekly changes in attachment and depression, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*
- b. The association between biweekly changes in attachment and general anxiety, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*

Ma (2009) found that mindfulness partially mediated the association between changes in attachment and psychological functioning. This study will attempt to replicate her findings using biweekly state changes in these variables, to determine if the partial mediation of the association holds true when examining small changes over the course of therapy.

Hypothesis IV. The association between short-term changes in mindfulness and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in attachment.

- a. The association between biweekly changes in mindfulness and depression, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.*

b. The association between biweekly changes in mindfulness and general anxiety, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.

In line with the objections of Ryan et al. (2007) to the hypothesis of Shaver et al. (2007), that increased adult secure attachment, and not increased mindfulness, is the main catalyst for enhanced psychological health, this study will attempt to determine whether the association between mindfulness and attachment is in fact bidirectional, in terms of the ability of these constructs to reduce depression and general anxiety over time as depicted in Figure 3.

Hypothesis V. The association between biweekly changes in mindfulness and attachment, and biweekly changes in state depression, will predict pre-post changes in trait depression.

Hypothesis VI. The association between biweekly changes in mindfulness and attachment, and biweekly changes in state general anxiety, will predict pre-post changes in trait general anxiety.

In order to determine if the expected associations between short term state changes in mindfulness and attachment, and decreases in depression and general anxiety, will translate to more permanent trait changes in depression and general anxiety, beta values from Hypothesis II a and b will be correlated with trait changes in depression and anxiety. Significant findings will allow us to infer that small gains in mindfulness skills and small increases in secure attachment over the course of therapy, indeed translate into longer term, trait, therapeutic gains.

Hypotheses for the Normative Class Study

All of the hypotheses described above will also be tested for the class study, except for Hypothesis I, as it is not expected that there will be any change in trait levels of depression, general anxiety, mindfulness, or attachment within a normative sample who are not engaging in any explicit therapeutic intervention. The purpose of the normative class study is to determine if there are any major differences in the associations between changes in mindfulness, attachment,

depression, and general anxiety in a non-clinical versus a clinical sample. Again it should be noted that depressed and anxious mood are the dependent variables in the normative class sample, as opposed to clinical depression and general anxiety in the clinical sample. While comparisons between these two samples should be made with caution, depressed and anxious mood and clinical depression and anxiety are highly correlated and therefore the results of the normative class study are likely to add to the understanding of how changes in mindfulness and attachment impact psychological well-being over time.

Hypothesis I: *Changes in state mindfulness and state attachment will predict changes in psychological functioning.*

- a. *Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in depressed mood above what is accounted for by fluctuations in participants' perceptions of daily events (good and bad).*
- b. *Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in anxious mood above what is accounted for by fluctuations in participants' perceptions of daily events (good and bad).*
- c. *Overall changes in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in depressed mood.*
- d. *Overall change in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in anxious mood.*

Hypothesis II: *The association between short-term changes in attachment styles and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in mindfulness.*

- a. *The association between biweekly changes in attachment and depressed mood, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*
- b. *The association between biweekly changes in attachment and anxious mood, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*

Hypothesis III: The association between short-term changes in mindfulness and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in attachment.

- a. *The association between biweekly changes in mindfulness and depressed mood, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.*
- b. *The association between biweekly changes in mindfulness and anxious mood, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.*

Hypothesis IV: The correlation between biweekly changes in mindfulness and attachment styles, and biweekly changes in depressed mood, will predict pre-post changes in trait depression.

Hypothesis V: The correlation between biweekly changes in mindfulness and attachment styles, and biweekly changes in anxious mood, will predict pre-post changes in trait general anxiety.

Chapter 4

Methods

Participants

Two samples of data were collected. In the first sample, participants were recruited from four counseling centers: the University of Kansas Counseling and Psychological Services; the University of Missouri, Kansas City Counseling and Psychological Services; Baker University Counseling Center; and KU Psychological Clinic.

Of the 52 students who took the initial assessment, 28 completed the entire five weeks of daily assessments, and the final assessment, and were included in the final analysis. Of the 28 students who completed the study, 23 received services from KU Counseling and Psychological Services, and 5 were from the University of Missouri, Kansas City. No students participated from either Baker University or KU's Psychological Clinic. An overwhelming percentage of the participants were female, 26 of 28, and white, 26 of 28. Two identified themselves as Asian Americans. The participants ranged in age from 18 to 31 years of age ($M = 22$).

A series of one way ANOVAs were used to test differences in initial trait scores, between those who completed the study and those who dropped out. No significant differences were found for any of the studies' major variables: depression, $F(1, 51) = 1.55, p = .22$; anxiety, $F(1, 51) = 2.67, p = .11$; avoidant attachment, $F(1, 51) = .50, p = .48$; anxious attachment, $F(1, 51) = .04, p = .84$; and mindfulness, $F(1, 51) = .11, p = .74$.

The second sample included students recruited from a large undergraduate Introduction to Social Psychology class. Interested students were directed to a website where they generated a study ID. Using this ID, participants were required to complete an initial survey (approximately fifteen minutes in length), five weeks of daily assessments (approximately three minutes in length), and a final assessment (fifteen minutes). Each evening a reminder email was sent to each

participant in a secure manner as to protect their privacy.

One hundred twenty one participants completed the initial assessment. Of those who began the study, 93 completed enough assessments to calculate at least one biweekly change and were therefore included in the study. Eighty one participants completed the entire study, including the final assessment. Of those included in the study, 72% were female, 82% were Caucasian, 5% Asian American, 5% African American, 6% Latino, 1% Native American, and 1% reported other or mix ethnicity. The students ranged in age from 18 to 49 ($M = 21$ years). A series of one way ANOVAs did not show any significant differences in initial trait scores, between those who completed the study and those who dropped out: depression, $F(1, 127) = .14$, $p = .71$; anxiety, $F(1, 127) = .17$, $p = .68$; avoidant attachment, $F(1, 127) = .53$, $p = .47$; anxious attachment, $F(1, 127) = .15$, $p = .70$; and mindfulness, $F(1, 127) = .03$, $p = .96$.

Measures and Procedures

Each student who initiated therapy at one of these centers was given a flier outlining the nature of the study. The fliers had a box for students to indicate whether they were interested in participating. Those who checked yes were asked to provide an email address, which was used for all communications with the participant-initiating contact, providing instructions on completion of the initial assessment, sending daily reminders during the five weeks of daily assessments, and prompting those near completion to take the final assessment. Students who completed the study were paid \$25 and given a free coupon to Wheat State Pizza, a local Kansas pizzeria.

All measures were completed online through Qualitrics (Qualitrics Labs, Version 2009, www.qualitrics.com). Seven measures were used in both studies, three for the initial and final assessments, and four to measure participants' daily functioning. Similar measures were used in the initial and final assessments for both studies, but the two studies used different daily

batteries. The initial assessments gathered demographic information, including gender, age, ethnicity, and romantic relationship status. Study 1's initial assessment also included questions regarding the clients' goals for therapy, use of psychotropic medications, and participation in group therapy. The measures used in the study were a part of a larger battery that included other measures of personality, therapy-related variables, and mindfulness.

Initial and Final Battery Studies 1 and 2

Adult attachment. The Experience in Close Relationship Scale (ECR-S; Wei, Russell, Mallinckrodt, & Vogel, 2007), a 36-item self-report measure, was used to assess adult attachment. The ECR-S is made up of two orthogonal scales. Eighteen items measure attachment anxiety, such as “I worry a lot about my relationships,” and eighteen tap attachment avoidance- “I prefer not to show others how I feel deep down.” Participants are asked to respond using a 1 (disagree strongly) to 7 (agree strongly) response scale. Low scores on both anxiety and avoidance are considered to represent secure attachment. The ECR had good internal validity in both studies (avoidant = .94, and anxiety = .91, in Study 1; avoidant = .92, and anxiety = .94 in Study 2). In a previous study, Fairchild and Finney (2006) also found good internal validity (avoidant = .93 and anxiety = .92), and also provided evidence for convergent validity, in finding significant relationships between the ECR and the conceptually similar constructs of social support and loneliness. Sibley and Liu (2004) found both scales of the ECR to be extremely stable over time; participants' scores on each scale at time 1 accounted for 86% of the variance 6 weeks later.

Mindfulness was assessed using the non-reactivity to inner experiences subscale of the Five Facet Mindfulness Scale (FFMS; Baer et al., 2008). The scale assesses participants' ability to observe internal phenomena without reacting- “When I have distressing thoughts or images I am able just to notice them without reacting.” Participants are asked to respond using a 0 (Not at

all) to 4 (Very much) response scale. The non-reactivity scale of the FFMS had adequate internal validity (Cronbach's alpha = .70 in Study 1, and .81 in Study 2). Baer et al. (2006) also found adequate internal validity with alpha's of .75, while also providing solid evidence for both convergent and divergent validity, with positive correlations with similar constructs such as openness to experience, emotional intelligence, and self compassion; and divergent validity with constructs such as absentmindedness, neuroticism, experiential avoidance, and difficulties with emotional regulation.

Mental Health. The Depression Anxiety Stress Scale (DASS-21; Ng, Trauer, Dodd, Callaly, Cambell, & Berk, 2007), a 21-item self-report measure, was used to assess levels of depression. Exemplary items include “I felt downhearted and blue,” for depression, and, “I felt close to panic,” for anxiety. Participants were asked to respond using a 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time) response scale. The DASS-21 had good internal validity, with Cronbach alphas of .91 for the depression subscale and .88 for the anxiety subscale in Study 1, and .86 and .82 in Study 2. Antony, Bieling, Cox, Enns, and Swinson (1998), found good internal validity for both depression and anxiety, .94 and .87 respectively. The authors also found that both subscales correlated with three widely used depression and anxiety inventories, the Beck Depression Inventory, the Beck Anxiety Inventory, and the State-Trait Anxiety Inventory.

Study 1: Daily Assessment Battery

The daily assessment battery in Study 1 included four assessments. Two items assessed clients' perceptions of good and bad daily events. The questions were measured on a seven point Likert scale, ranging from 1 (not at all) to 7 (very true). The questions were: "Something good happened today," and “something bad happened today.”

Daily changes in attachment was assessed using the State Adult Attachment Measure

(SAAM: Gillath, Hart, Nofhle, & Stockdale, 2009) which assesses state levels of secure attachment, “I feel secure and close to other people,” avoidant attachment, “I’m afraid someone will want to get too close to me,” and anxious attachment “I really need someone’s emotional support.” Participants are asked to respond using a 1 (Strongly Disagree) to 7 (Strongly Agree) response scale. The SAAM had good internal validity with Cronbach’s alphas of .94, .94, and .91 for secure, avoidant, and anxious attachment respectively. The internal validity in our study was slightly higher than in the study of Gillath et al. (2009), where alphas ranged from .83 to .87. Gillath et al. (2009) also established good convergent validity, showing significant positive correlations with the Experience in Relationship Questionnaire (used in this study) as well as other conceptually similar constructs, such as trust, relationship sensitivity, and relationship satisfaction.

Changes in mindfulness were assessed using the Cognitive and Affective Mindfulness Scale Revised (CAMS-R). CAMS-R is a 12-item self-report measure, with items such as “I was able to focus on the present moment.” Participants are asked to respond using a 1 (Rarely/Not at all) to 7 (Almost always) response scale. The current sample had good internal validity (Cronbach alpha = .90), which was higher than in two samples collected by Feldman, Hayes, Kumar, Greeson, and Laurenceau (2007), who found alpha's of .74 and .77. The authors also established construct validity by finding significant positive correlations with prior measures of mindfulness, and attention to feelings, and negative correlations with brooding, experiential avoidance, and thought suppression. The measure was selected over other mindfulness measures because of its use with both clinical and college populations (Feldman et al., 2007). The CAMS-R was altered slightly in the study to measure state mindfulness. Participants were asked to reflect on their feelings "over the past day," rather than generally, as implied by the language in the original measure. In addition, the questions were reworded in past tense, in order to once

again cue participants to reflect on how they were feeling during the past day, rather than generally. These alterations were suggested by Feldman and colleagues as a way to measure everyday state mindfulness.

As with the initial and final batteries, the depression and anxiety subscales of the DASS were used to assess daily changes in participants' psychological functioning. Again the DASS had good internal validity in the daily battery with Cronbach alphas of .85 for anxiety and .89 for depression. The measure's instructions were adjusted to ask participants about their experiences over the previous day, rather than the previous week, as done with the initial and final batteries.

Study 2: Daily Assessment Battery

The daily assessment battery included four measures: 1. A six-item measure constructed for the current study was used to assess good and bad events experienced by the participants each day. These events were related to family, work and/or school, and miscellaneous events. Items were measured on a seven point Likert scale ranging from 1 (Not at all) to 7 (Very true), and included statements such as: "Something good happened at work or school today," and "Something bad happened at work or school today." The constructed measure had adequate internal reliability with Cronbach alphas of .75 for good items, and .70 for bad items.

Daily level of attachment was assessed using the short form of the State Adult Attachment Measure (SAAM; Gillath et al., 2009), which includes nine items, three per factor (anxiety, avoidance, and security). Participants used a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree) to respond to items such as, "I feel loved," and "I really need someone's emotional support." The shorter measure was used to reduce the assessment burden on participants; it has not been used in other published studies. In the current study, the SAAM factors had good internal validity with Cronbach alphas of .86, .81 and .86 for the secure, anxious, and avoidant scales respectively.

Daily level of mindfulness was assessed using the decentering factor of the Toronto Mindfulness Scale (TMS; Lau et al., 2006). The TMS is a measure of dispositional mindfulness, with items such as, "I am open to taking notice of anything that might come up." Participants used a 7-point Likert scale ranging from 1 (Not at all) to 7 (Very true). In the current study, TMS had good internal validity with a Cronbach alpha of .82. Lau et al. (2006) found similarly good internally validity of .87, and also established construct validity with conceptually similar constructs such as reflective self awareness, openness to experience, and psychological mindedness.

To assess daily mood, two items from the Positive and Negative Affect Scale (PANAS: Crawford & Henry, 2004) were used: "Overall I felt sad/down," and "Overall I felt anxious/nervous." Participants used a 7-point Likert scale ranging from 1 (Not at all) to 7 (Very true).

Analytical Approach-Study 1

Five paired sample t-tests were used to test Hypothesis I, whether pre to post reductions in anxious and avoidant attachment, mindfulness, depression, and general anxiety took place. Bonferroni's correction (Tabachnick & Fidell, 2006) was used to control for type I error; a p-value of .01 was used to test significance for each independent factor.

In preparation for the analysis of the remaining hypotheses, biweekly slopes were calculated manually for each variable, whenever a participant completed either three consecutive daily assessments, or three or more assessments over a four-day period. Hierarchical linear models, using Lisrel software (Joreskog & Sorbom, 1989) were used to test hypotheses II thru IV. A series of four fixed Models were used to test Hypothesis II a and b. The first two Models measured the degree to which short-term changes in attachment and mindfulness correlated with changes in depression and anxiety. In order to test the associations between mindfulness and

attachment, beyond what was explained by good and bad events, changes in good and bad events were added to Models Three and Four.

To test Hypothesis II c and d, slopes for the overall change in each measure over the course of the study were calculated for each participant. A Pearson correlation matrix was calculated to determine the associations between the overall change in mindfulness and attachment to depression and general anxiety. A multiple linear regression model was used to determine the degree to which study-long changes in attachment style as a whole, correlated with study-long changes in depression and general anxiety.

A three-step partial mediation analysis was used to test Hypotheses II and III (Baron & Kenny, 1986). This analysis is depicted in Figures I and II. Hierarchical Linear Models were used in Step 1 of the Model (Path A in the appendix) to test whether the independent variables, attachment for Hypothesis I, and mindfulness for Hypothesis II, predicted the mediators, mindfulness for Hypothesis I, and attachment for Hypothesis II. The information used to test Hypothesis II a and b, was used in the second step of the analysis- whether the moderator correlated with the dependent variables, which were changes in depression and general anxiety. Sobel's mediation test (Baron & Kenny, 1986) was used to test Path C', which tests whether the addition of the mediator to the model significantly reduces the strength of the association between the independent variable and the dependent variable.

In order to test Hypotheses V and VI, the correlations between biweekly changes for all combinations of the independent variables – secure, anxious and avoidant attachment, and mindfulness – were correlated with biweekly changes for the two dependent variables- depression and general anxiety, for each participant separately. This analysis yielded eight total correlations for each participant. These correlation coefficients were then correlated with the pre-post changes in trait depression and general anxiety.

Analytical Approach-Study 2

Hypothesis I of Study 1 was not included in Study 2 as there is no expectation that there will be significant changes to the psychological functioning within this normative sample. The analysis of Hypotheses I through V of Study 1 was identical to the analysis of Hypothesis II through VI of Study 2, with Hypothesis I matching II, II matching III, III matching IV, V matching IV, and VI matching V.

Chapter 5

Therapy Study Results

Hypothesis I: *There will be pre-post (trait) reductions in levels of depression and anxiety, and pre-post gains in levels of mindfulness and secure attachment.*

A set of paired sample t-tests was used to test differences between pre and post levels of depression, general anxiety, mindfulness, and attachment. Results partially confirmed the hypothesis in that significant reductions were found in levels of depression, $t(27) = -3.16, p < .001$. A Cohen's effect size estimate of, $d = .71$ indicated that this is a large effect. This means that, following therapy, the participants levels of depression decreased. Also, significant reductions were also found in levels of general anxiety, $t(27) = -2.52, p < .01$. An effect size of .49 suggests a moderate effect, which shows that there were also decreases in the level of general anxiety in the participants, though not to the level of the decreases in depression. Additionally, participants increased significantly in pre to post levels of mindfulness, $t(27) = 2.32, p < .01$. The estimated effect size of $d = .43$, suggests a small to moderate effect, meaning that there was an increase in feelings in the general ability to observe, be aware and be comfortable with their surroundings. No statistically significant differences were found for either of the attachment factors of anxious attachment $t(27) = 1.22, p = .12$, or avoidant attachment, $t(27) = .749, p = .23$ (potentially due to the structure of the ECR which was supposed to provide stability across time). An effect size of .39 for anxious attachment suggests a small to medium effect while an effect size of .21 for avoidant attachment suggest a small effect. The null effect for attachment may relate to the small sample size, or, as mentioned, to the stable nature of the ECR. We did, however, continue to test state changes in attachment as a possible predictor of changes in depression and anxiety as the effects of attachment may be related more to state rather than trait influences.

Hypothesis II: *Changes in mindfulness and attachment will predict changes in psychological functioning.*

- a. *Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in depression above what is accounted for by fluctuations in clients' perceptions of daily events (good and bad).*
- b. *Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in general anxiety above what is accounted for by fluctuations in clients' perceptions of daily events (good and bad).*
- c. *Overall change in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in depression over the same time period.*
- d. *Overall change in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in general anxiety over the same time period.*

Hierarchical multiple linear models 3 and 4 (see Table 1) support Hypothesis IIa, showing that changes in attachment styles and mindfulness over short periods of time (biweekly) predicted short term changes in depression (biweekly), above what was accounted for by changes in clients' perceptions of external daily events (i.e. feeling as though they had a good or bad day). Specifically, biweekly changes in mindfulness, $\beta = -.26, p < .001$, attachment anxiety, $\beta = .05, p < .01$, avoidant attachment, $\beta = .20, p < .001$ and secure attachment, $\beta = -.06, p < .05$, were significant beyond what was accounted for by changes in good and bad events. This means that during discrete short periods of time, as participants became more mindful and more securely

attached in therapy, their depression levels decreased. Effect sizes estimates indicate that a one point increase in mindfulness and secure attachment corresponds to a .29 and .09 drop in depression (over a biweekly period). A one point decrease in avoidant and anxious attachment correspond to a .23 and .08 decrease in depression over the same time period.

Hierarchical multiple linear models 3 and 4 (see Table 2) partially support Hypothesis IIb that changes over short time periods (biweekly) in mindfulness and attachment will predict short term changes in general anxiety. Biweekly changes in mindfulness, $\beta = -.09, p < .001$ and avoidant attachment, $\beta = .13, p < .001$, predicted biweekly changes in general anxiety above what was accounted for by changes in good and bad events. This shows that as clients become more mindful and less likely to avoid intense intimate relationships, their general anxiety decreased. Additionally, biweekly changes in attachment anxiety predicted changes in general anxiety in Model 1, when only attachment was considered, but not in Model 3 when good and bad events were entered into the model. This indicates that clients' perceptions of daily life events explained away (fully mediated) the association between attachment anxiety and general anxiety. Biweekly changes in secure attachment did not relate to changes in anxiety. Effect sizes indicate that a one point increase in mindfulness corresponds to -.11 drop in anxiety and that a one point decrease in avoidant attachment corresponds to -.12 drop in anxiety.

Table 3 shows the zero order correlations between changes in mindfulness, attachment, depression, and anxiety over the course of the five-week study. Hypothesis IIc and IId were partially supported; the overall rate of change of attachment, but not mindfulness, predicted the overall rate of change in depression and general anxiety. Specifically, changes in avoidant attachment significantly related to depression, $r = .60, p < .001$, and general anxiety, $r = .68, p < .001$, in that lower levels of avoidant attachment was associated to both decreases in depression and decreases in anxiety. Also, while changes in attachment anxiety were significantly associated

to changes in depression $r = .44, p < .01$, they were not associated to changes in general anxiety, meaning that participants who showed a decrease in anxiety towards attachments with others also showed a decrease in reported depression, but showed no associated changes in anxiety. State secure attachment inversely correlated with general anxiety, $r = -.35, p < .05$, but not with depression, meaning that those who reported higher levels of secure attachment at certain times showed lower levels of anxiety; however, there was no association to depression. Finally, mindfulness did not relate to either depression or general anxiety.

Squaring these correlation coefficients provides estimates for the proportion of the variance in changes in depression and anxiety that were accounted for by changes in attachment and mindfulness. The overall change in avoidant attachment accounts for 36% of the change in depression, and 46% of the change in anxiety. The overall rate of change in attachment anxiety accounts for 19% percent of the change in depression; the overall rate of change in secure state attachment accounts for 12% of the change in general anxiety.

A multiple linear regression model was used to test the statistical combination of the overall change of all three attachment styles and depression. Attachment style significantly predicted changes in depression, $F(3, 24) = 8.89, p < .001$. Further examination showed that partial correlations for both avoidant attachment $r = .32, p < .05$ and attachment anxiety $r = .40, p < .01$ were significantly related to changes in depression; however, secure attachment was not significantly related to depression. A second step in the model, including mindfulness, did not significantly explain any unique variance, $F \text{ change}(1, 23) = .15, p = .70$.

As seen with depression, attachment style significantly predicted changes in general anxiety, $F(3, 24) = 7.66, p < .001$. Partial correlations for only avoidant attachment $r = .48, p < .01$, but not for anxious or secure attachment, predicted changes in general anxiety. A second

step in the model, including mindfulness, did not significantly explain any unique variance, F change (1, 23) = .409, $p = .529$.

Overall, the analysis of IIa thru IIc supports Hypothesis II. For short time periods (biweekly), changes in attachment and mindfulness correlated with changes in depression, above what was accounted for by fluctuations in daily events. Short-term changes in mindfulness and avoidant attachment, but not in anxious or secure attachment, correlated with changes in general anxiety, above what was accounted for by fluctuations in daily events. There was a slightly different pattern for longer-term changes (represented as the overall slope over the course of the entire study); the statistical combination of attachment factors predicted changes in depression and general anxiety, but changes in mindfulness did not relate to changes in either depression or general anxiety. When changes in attachment factors were considered separately, anxious and avoidant attachment, but not secure attachment, predicted changes in depression, while only changes in avoidant attachment predicted changes in general anxiety.

Hypothesis III: *The association between short-term changes in state attachment and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in mindfulness.*

- a. *The association between biweekly changes in attachment and depression, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*
- b. *The association between biweekly changes in attachment and general anxiety, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*

A three-step partial mediation analysis (Baron & Kenny, 1986), supported Hypothesis IIIa. Mindfulness partially mediated the association between biweekly changes in avoidant

attachment and changes in depression, above what is accounted for by fluctuations in good and bad daily events. This means that, when mindfulness is added to a model which includes avoidant attachment and depression (see Table 1, model 5), it both independently correlates with reductions in depression, and also decreases the strength of the relationship between avoidant attachment and depression. The partial mediation analysis is displayed in Figure 1. Mindfulness fully mediates the association between biweekly changes in secure and anxious attachment and changes in depression, above what is accounted for by fluctuations in daily events. This means that, beyond the way a participant felt on a day to day basis, when mindfulness was added to the connection between both secure and anxious attachment and depression, it fully explained the connection. As shown in Table 4, model 1, biweekly changes in all three state attachment scores significantly predicted biweekly changes in mindfulness (Path A in Figure 1). Significant correlations between biweekly changes in mindfulness and depression, Path B, and the association between biweekly changes in attachment and depression, Path C', have been established in Hypothesis II, Table 1. Sobel's mediation test (Baron & Kenny, 1986) showed that adding biweekly changes in mindfulness into a model containing state attachment and good and bad events, significantly reduced the strength of the association between biweekly changes in depression and anxious attachment, $t = 3.92, p < .001$, avoidant $t = 3.99, p < .001$, and secure attachment $t = -4.43, p < .001$. Table 1, model 5, shows that the association between biweekly changes in secure and anxious attachment and depression are fully mediated by changes in mindfulness (secure and anxious attachment are no longer significant when mindfulness is added to the model), while biweekly changes in avoidant attachment was partially mediated by changes in mindfulness; the association remained significant after adding mindfulness to model 5. These results suggest that increases in mindfulness, over the course of therapy, both predict decreases

in avoidant attachment and act in conjunction with decreased avoidant attachment to reduce symptoms of clinical depression.

A three-step mediation analysis partially supported Hypothesis IIIb. Mindfulness partially mediated the association between biweekly changes in avoidant attachment and general anxiety (above what is explained by good and bad events), meaning that in the short term, beyond what was explained by day to day positive or negative feelings, when mindfulness was added to a model measuring the association between avoidant attachment and general anxiety (see table 2, model 5), it led to a decrease in feelings of anxiety. As established in Hypothesis II, biweekly changes in secure and anxious attachment styles did not significantly relate to changes in general anxiety above what is accounted for by daily fluctuations in good and bad events. As stated above, Path A of Figure 1 is significant; biweekly changes in avoidant attachment predict changes in mindfulness. Paths B and C were again established in Hypothesis II; mindfulness and avoidant attachment are significantly associated to general anxiety, above what is explained by daily fluctuations in daily events. Sobel's mediation test was significant, $t = 3.72, p < .001$, suggesting that the addition of mindfulness into a model containing attachment and good and bad events, significantly reduces the association between biweekly changes in avoidant attachment, and changes in general anxiety. These results suggest that increases in mindfulness, over the course of therapy, both predict decreases in avoidant attachment and act in conjunction with decreased avoidant attachment to reduce symptoms of general anxiety.

Hypothesis IV: *The association between short-term changes in mindfulness and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in attachment.*

- a. *The association between biweekly changes in mindfulness and depression, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.*
- b. *The association between biweekly changes in mindfulness and general anxiety, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.*

Figure 2 shows the proposed partial mediation analysis for Hypothesis IV. A three-step mediation analysis supports Hypothesis IVa, that biweekly changes in attachment styles partially mediated the association between biweekly changes in mindfulness and changes in depression, above what is accounted for by fluctuations in daily events. This means that on a short term basis, beyond what is explained by day to day feelings, a participant's changes in attachment styles decreased with the feelings of depression. Table 4, models 2 through 4, shows that biweekly changes in mindfulness significantly predict all three state attachment scores, establishing Path A of Figure 2. As established in Hypothesis I, biweekly changes in all three attachment scores significantly predicted changes in depression (Table 1). Sobel's mediation test was significant for all three attachment styles, anxious, $t = 3.72, p < .001$, avoidant, $t = 3.72, p < .001$ and secure, $t = 3.72, p < .001$, which suggests that adding attachment to a model containing mindfulness and good and bad events, significantly reduces the strength of the association between biweekly changes in mindfulness, and changes in depression, above what was accounted for by fluctuations in daily events.

Hypothesis IVb was not supported; changes in attachment did not partially mediate the association between biweekly changes in mindfulness and changes in general anxiety, above what was accounted for by fluctuations in daily events. In Table 2, when attachment was added in model 5, to model 4 which included only mindfulness, the association between mindfulness

and general anxiety did not change ($\beta = -.09, p < .001$). This suggests that changes in attachment did not influence the association between changes in mindfulness, and changes in general anxiety.

Hypothesis V: *The correlation between biweekly changes in mindfulness and state attachment scores, and biweekly changes in state depression, will predict pre-post changes in trait depression.*

Hypothesis V was partially supported. The correlation between biweekly changes in avoidant attachment and biweekly changes in state depression significantly related to pre-post changes in depression $r = .42, p < .05$. This means that decreases in avoidant attachment in the short term were related to decreases in trait depression. No associations to pre-post changes in depression were found with biweekly changes in mindfulness, or with the other state attachment scores. This finding suggests that short term changes in avoidant attachment, over the course of therapy, have a long term link with a participants' trait depression.

Hypothesis VI: *The correlation between biweekly changes in mindfulness and state attachment scores and biweekly changes in state anxiety will predict pre-post changes in trait anxiety.*

Hypothesis VI was mainly supported. The correlation between biweekly changes in two of the three attachment scores, secure, $r = -.39, p < .05$ and avoidant, $r = .39, p < .05$, and state anxiety, significantly related to pre-post (trait) changes in anxiety, while the association between biweekly changes in anxious attachment and state general anxiety did not significantly relate to pre-post changes in general anxiety. The correlation between biweekly changes in mindfulness and changes in state general anxiety also predicted pre-post changes in trait anxiety $r = -.51, p < .01$. This finding suggests that short term changes in attachment and mindfulness, over the course of therapy, have a long term impact on a participant's trait anxiety.

Chapter 6

Class Study Results

Hypothesis I: *Changes in mindfulness and state attachment will predict changes in psychological functioning.*

- a. Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in depression above what is accounted for by fluctuations in participants' perceptions of daily events (good and bad).
- b. Changes in mindfulness and attachment over short time periods (biweekly) will predict short-term (biweekly) changes in general anxious mood above what is accounted for by fluctuations in participants' perceptions of daily events (good and bad).
- c. Overall changes in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in depression.
- d. Overall change in mindfulness and attachment (represented as the overall slope over the course of the entire study) will predict overall changes in anxious mood (over the same time period).

Hierarchical multiple linear models 3 and 4, in Table 5, support Hypothesis Ia, such that changes in state attachment and mindfulness over short periods of time (biweekly) predicted short term (biweekly) changes in depressed mood, above what was accounted for by changes in participants' perceptions of external daily events. Specifically biweekly changes in mindfulness, $\beta = -.05, p < .001$, anxious attachment, $\beta = .10, p < .001$, secure attachment, $\beta = -.15, p < .001$, but not avoidant attachment, were significantly related to depressed mood above the variance accounted for by changes in good and bad events. This means that, when looking beyond the

participants feeling of having a negative or positive day, when their level of mindfulness increased and secure attachment increased their level of depressed mood decreased. Additionally, when their level of anxious attachment decreased, their depressed mood also decreased. Effect sizes indicate that one point increases in mindfulness and secure attachment correspond to .07 and .16 decrease in depression, respectively. A one point decrease in anxious attachment corresponds to a .11 decrease in depressed mood.

Hierarchical multiple linear models 3 and 4, in Table 6, partially supported Hypothesis Ib such that changes in state attachment scores and mindfulness over short periods of time (biweekly) predicted short term (biweekly) changes in anxious mood, above what was accounted for by changes in participants' perceptions of external daily events. Specifically, biweekly changes in anxious attachment, $\beta = .06, p < .001$, secure attachment, $\beta = -.06, p < .001$, but not avoidant attachment or mindfulness, were significantly related to anxious mood above the variance accounted for by changes in good and bad events. This means that, during a discrete period of time, when participants' levels of anxious attachment decreased and their levels of secure attachment increased, their levels of anxious mood decreased. Effect sizes indicate that a one point decrease in anxious attachment and a one point decrease in anxious attachment both correspond to .06 decreases in anxious mood.

Table 7, a correlation matrix showing the associations between overall slopes and pre-post differences in trait measures was used in conjunction with multiple regression models to test Hypotheses Ic and Id. Significant zero order correlations were found between the overall change in depressed mood and secure attachment, $r(81) = -.33, p < .01$, and anxious attachment, $r(81) = -.44, p < .01$, but not mindfulness, or avoidant attachment. Squaring these correlation coefficients provides estimates for the overall rate of change related to secure and anxious attachment. Secure

attachment accounts for 11% of the variance in the overall rate of change of depression, while anxious attachment accounts for 19% of the variance.

A multiple linear regression model was used to test the statistical combination of the overall change in all three attachment styles and depression. Attachment style significantly predicted changes in depressed mood, $F(3, 77) = 8.53, p < .001$. Part correlations for both secure attachment $r = -.23, p < .05$ and anxious attachment $r = -.37, p < .001$, were significantly related to changes in depressed mood; avoidant attachment was not significantly related, $r = -.03, p = .76$. A second step in the model, including mindfulness, did not significantly explain any unique variance, F change $(1, 76) = .728, p = .40$.

Zero order correlations in Table 7, show that changes in secure attachment, $r(81) = -.24, p < .05$, and anxious attachment $r(81) = -.29, p < .01$, significantly relate to changes in anxious mood. The overall change in avoidant attachment and mindfulness did not relate to the slope of anxious mood. These findings suggest that 6% and 8% of the overall change in depressed mood can be accounted for by secure and anxious attachment respectively. A multiple linear regression model found that the statistical combinations of changes in attachment styles significantly predicted changes in anxious mood, $F(3, 77) = 4.04, p < .05$. Within this model, only anxious attachment had a significant part correlation $r = .25, p < .05$.

Overall, the analysis of Ia thru Id supports Hypothesis I. In general, changes in mindfulness and attachment predict changes in both depressed and anxious mood, above what was explained by changes in perceptions of good and bad daily events. More specifically, short term (biweekly) changes in mindfulness, anxious and secure attachment, but not avoidant attachment, predicted short term changes in both depressed and anxious mood, above what was accounted for by changes in good and bad events. When mindfulness and attachment styles were considered together, mindfulness did not uniquely contribute to the prediction of changes in

depression. For longer periods of time (represented as the overall slope over the course of the study), only secure and anxious attachment predicted changes in depressed and anxious mood.

Hypothesis II: *The association between short-term changes in attachment styles and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in mindfulness.*

- a. *The association between biweekly changes in attachment and depression, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*
- b. *The association between biweekly changes in attachment and anxious mood, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in mindfulness.*

Hypothesis IIa was not supported. Model 5, in Table 5, shows that when mindfulness is added to a model containing attachment styles and good and bad events, there is no reduction in the strength of the associations between any of the three attachment styles and depressed mood. This suggests that the association between attachment and depressed mood was independent of the association between mindfulness and depressed mood.

Hypothesis IIb was only partly supported. Model 5, in Table 6, shows that when mindfulness was added to a model containing attachment and good and bad events, there was no reduction in the strength of the associations between biweekly changes in avoidant or anxious attachment and anxious mood. Sobel's mediation test was significant for secure attachment, $t = -2.81, p < .01$, indicating that mindfulness partially mediates the association between biweekly changes in secure attachment and changes in anxious mood. This suggests that the association between secure attachment and anxious mood was reduced significantly by the positive association between mindfulness and anxious mood.

Hypothesis III: *The association between short-term changes in mindfulness and psychological functioning, above what is accounted for by fluctuations in daily events, will be partially mediated by short-term changes in attachment.*

- a. *The association between biweekly changes in mindfulness and depressed mood, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.*
- b. *The association between biweekly changes in mindfulness and anxious mood, above what is accounted for by fluctuations in daily events, will be partially mediated by biweekly changes in attachment.*

Hypothesis III was supported for anxious and secure attachment, but not for avoidant attachment; change in avoidant attachment was not significantly related to either biweekly changes in depressed or anxious mood (Table 5 and 6). As seen in Table 8, mindfulness was a significant predictor of both secure and anxious attachment. Sobel's mediation test confirmed Hypothesis IIIa, that secure attachment $t = -8.03, p < .001$ and anxious attachment $t = -3.30, p < .001$ partially mediated the association between biweekly changes in mindfulness and changes in depressed mood, above what was accounted for by good and bad events. Sobel's test of mediation also supported Hypothesis IIIb, that secure, $t = 2.86, p < .01$ and anxious attachment, $t = -2.28, p < .05$, are partial mediators of the association between biweekly changes in mindfulness and changes in anxious mood.

Hypothesis IV: *The correlation between biweekly changes in mindfulness and state attachment scores, and biweekly changes in state depression, will predict pre-post changes in trait depression.*

Overall Hypothesis IV was not supported; correlations between biweekly changes in mindfulness and attachment and depressed mood were unrelated to pre-post trait changes in

general depression. This suggests that short term changes in neither attachment nor mindfulness related to long term trait changes in general depression.

Hypothesis V: *The correlation between biweekly changes in mindfulness and state attachment scores, and biweekly changes in state anxiety, will predict pre-post changes in trait anxiety.*

Hypothesis V was also not supported; correlations between biweekly changes in mindfulness and attachment, and depressed mood, were unrelated to pre-post trait changes in general anxiety. This also suggests that short term changes in neither attachment nor mindfulness related to long term trait changes in general anxiety.

Chapter 7

Discussion

The purpose of this study was to investigate whether mindfulness and attachment are common therapeutic mechanisms that underlie successful therapy across treatment modalities. This chapter will expand on the findings discussed in the previous sections by connecting our findings to past literature, discussing this study's limitation, and its implications for research and practice.

Results indicate that there are significant associations between both short (biweekly) and long (five week) increases in state mindfulness and secure attachment and corresponding reductions in symptoms of depression and anxiety. Of the attachment factors, reductions in avoidant attachment were most consistently associated with reductions in psychological symptoms (namely depression and anxiety), while reduced attachment anxiety was associated with reductions in depression, but not anxiety. Increases in mindfulness, unlike corresponding improvements in attachment, was linked to short term, but not long term therapeutic improvements. A second, non-clinical, sample showed a slightly different pattern. Changes in state secure and attachment anxiety but not avoidant attachment were predictive of reductions in depressed and anxious mood. Together these results indicate the significance of mindfulness and attachment as agents of change in therapy, especially with respect to the reduction in avoidant attachment. Reducing avoidant attachment seems to be significant in reducing psychological symptoms only in the clinical setting, as this association was not found in a non-clinical sample. Increases in state mindfulness seem to be associated with therapeutic change in the short term (biweekly), but not in the long term (over the course of the five week study). Results also indicate that reductions in avoidant attachment seem to be the major catalyst for reductions in depression, while changes in mindfulness seem to be the driving force behind reductions in

anxiety.

Trait Changes in Psychological Functioning During Therapy

As expected, and consistent with considerable past research (Grissom, 1996; Lipsey & Wilson, 1993; Wampold, 2001, 2010), we found significant pre-post trait reductions in depression and anxiety, and increases mindfulness. No significant reductions were found in either trait anxious or avoidant attachment. This non-significant result may be due to the Experience in Close Relationship scale (ECR) and its tendency to be very stable over time (Wei, Russell, Malinckrodt, & Vogel, 2007). In addition, small to moderate effect sizes for both attachment factors are an indication that the null effect may be due to the small sample size.

Attachment as a Common Factor

Our findings were generally consistent with our predictions. Small biweekly changes in all three attachment factors predicted temporally concurrent changes in state depression. Long term (5 weeks for the present study) changes in only anxious and avoidant, but not secure attachment predicted depression. These findings are consistent with prior studies that showed an association between changes toward more secure attachment styles and reductions in depression (Ma, 2009, McBride et al., 2006). Because low levels of anxious and avoidant attachment are often equated with secure attachment, our null findings for secure attachment in the long-term analysis may relate to how the questions are worded on the SAAM (State Adult Attachment Measure). It may be interesting for future research to test whether secure attachment may relate more than anxious and avoidant attachment to a positive psychological construct such as life satisfaction, where the scale used reflects the presence of positive features rather than the absence of negative ones.

This study expands on prior studies by showing that changes towards more secure attachment styles occur at the same time as decreases in depression. Additionally, it suggests that

attachment may be a common factor or causal agent of therapeutic change. Furthermore, our results indicate that reductions in avoidant attachment may play a particularly important role in decreasing long term or trait depression, as the association between short term reductions in avoidant attachment and reductions in state depression was correlated with reductions in trait depression, an association that was not found for either secure or attachment anxiety (a beta value was taken from the correlation between short term change scores in state avoidant attachment and short term changes in state depression and then correlated with pre-post changes in trait depression). This finding is consistent with research showing a strong link between behavioral activation and depression (Hopko, Lejuez, Ruggiero, & Eifert, 2003; Lejuez, Hopko, & Hopko, 2001). While activation may denote a variety of behaviors such as exercise, most behaviors are embedded within social contexts so that the willingness to engage socially or a tendency to use less avoidant interpersonal strategies may act as an antidote to long-term depressive tendencies. The relative importance of reductions in avoidant attachment to long-term reductions in depression, is consistent with neuropsychological research by Dawson et al. (2001), which showed that infants with avoidant attachment styles (as assessed by observations made during the strange situation procedure) exhibited lower levels of left frontal lobe activity- an area of the brain associated with positive affect and approach behaviors- than did securely attached infants. Additionally, infants of mothers who were depressed had lower levels of activity in the left frontal lobe, independent of their attachment styles. The three way association between depression, approach avoidance, and avoidant attachment, suggests that therapy may help to counterbalance early neuronal wiring that shaped later depressive tendencies. However, more specific neuropsychological research is needed to verify this connection.

A slightly different pattern was found between changes in attachment styles and state anxiety. Small changes in only state avoidant attachment predicted changes in anxiety, while

changes in both secure and avoidant attachment predicted long term (study long) changes in anxiety. Pre-post changes in trait anxiety were predicted by associations between state secure and avoidant attachment and state anxiety. The importance of changes in avoidant attachment in therapeutic outcome were consistent with the findings of Fonagy et al. (1996), findings that pre-therapy avoidant attached patients had the greatest relative therapeutic gains over the course of therapy.

This finding is also consistent with robust research on general anxiety from behavioral oriented researchers, which indicates that reductions in anxiety in behavioral therapy result from repeated exposures to feared stimuli (Mineka & Thomas, 2005). Such exposures, by their very nature, require clients to reduce avoidant behaviors, which often are a key part of the phobic cycle, wherein phobic clients habitually avoid feared stimuli in order to escape momentary discomfort, and the escape from discomfort in turn helps to reinforce avoidant behaviors. Since therapy requires ongoing exposure to an emotionally charged therapeutic relationship, it makes sense that the mechanism of change in therapy would be associated with a reduction in avoidant tendencies which hinder healthy exposure to feared interpersonal stimuli.

The role of secure attachment in long-term changes in anxiety may relate to the importance placed on bolstering clients' social support systems as they develop more adaptive attachment patterns. Attachment theorists have cited the evolutionary role of attachment as a natural mechanism that helps to alleviate anxiety because maintaining close attachments with other members of the tribe has helped to ensure a steady supply of food and safety from predators. Therefore, it seems logical that short term reductions in attachment avoidance associated with becoming involved in a therapeutic relationship, would lead to short term reductions in anxiety not only by desensitizing clients to feared stimuli, but also by encouraging them to form more secure attachments, which in the long run helps them to maintain and bolster

social supports as they face life's natural stressors.

Mindfulness as a Common Factor

The results relating to mindfulness were generally consistent with our predictions. Short term (biweekly) increases in mindfulness were associated with reductions in both depression and anxiety, over the same time period. While this result is consistent with past non-therapeutic studies linking mindfulness to both depression (Carmody et al., 2008; Chambers et al., 2008) and anxiety (Carmody et al., 2008; Evan et al., 2007) as well as therapeutic studies that found mindfulness to be a mediator of pre-post therapeutic gains (Brown & Ryan, 2003; Carmody & Baer, 2008; Carmody et al., 2008; Kumar et al. 2008; Ma, 2009), this is the first study to establish a temporal association between increases in mindfulness and reductions in depression and anxiety. This temporal association between the variables allows us to infer that the small therapeutic gains made over the course of therapy were simultaneously leading to increases in mindfulness and reductions in symptoms of anxiety and depression.

There was no significant correlation found when the rate of change in mindfulness and psychological functioning were examined over the course of the entire five-week study. This null finding may be due to natural fluctuations in state mindfulness, or possibly the effect of external circumstances such as exams or relationship problems. Together these findings suggest that the benefits of enhanced mindfulness in therapy may be due to its ability to produce immediate, short-term therapeutic gains.

The role of mindfulness as a short-term predictor of therapeutic gains was shown to extend to long term trait anxiety. Specifically the correlation between short term increases in mindfulness and reductions in state anxiety predicted pre-post trait reductions in general anxiety (a beta value was taken from the correlation between short term change scores in state mindfulness and short term changes in state anxiety and then correlated this beta value with pre-

post changes in trait anxiety). This suggests that mindfulness's role as a common factor in the short term translates into longer term, more stable, changes in anxiety. This finding may relate to the association between mindfulness and enhanced emotional regulation, more specifically to the association between decreased activity in the amygdala, an area of the brain associated with fear, and increased activity in the frontal cortex, an area associated with higher order thinking.

Conceptually, mindfulness is a practice of open engagement with the contents of one's experience. Research indicates that exposure to feared external stimuli desensitizes clients to irrational fears, and by exposing clients to internal feared states, increased mindfulness may similarly work to help clients gain the skills necessary to break their long term phobic cycles.

This significant correlation between short-term changes in mindfulness and decreased anxiety, was not found for trait depression; while changes in short term mindfulness may have a long term impact on trait anxiety, its function in relation to depression is limited to managing short term feelings. The capacity of mindfulness to elicit long term changes in anxiety, but not in depression, may relate to the fact that it is an intrapersonal skill, associated with the regulation of emotions, likely by decreasing amygdala activity, and increasing higher executive functioning in the frontal lobe (Creswell et al., 2007). The adaptive function of enhanced emotional regulation is vitally important in the short term, by helping clients learn to handle overwhelming anxiety and sadness. However, research on changes in depression over time tends to focus on behavioral activation and changing patterns of relationships, rather than on emotional regulation (Hopko et al., 2003; Lejuez et al., 2001). Therefore, mindfulness, as a reflective, intrapersonal skill may have less of an effect on these more active and relational skill developments.

The Association Between Mindfulness and Attachment in Bringing About Therapeutic Change

The results supported Ma's (2009) finding that mindfulness partially mediated the

association between changes in attachment and reductions in depression and anxiety.

Specifically, we found that mindfulness fully mediated the association between changes in anxious and secure attachment and depression and partially mediated the association between changes in avoidant attachment and depression. This finding suggests that changes in avoidant attachment and mindfulness are some of the driving mechanisms in reducing symptoms of depression, while changes in anxious and secure attachment are epiphenomenal to the process of therapeutic change. With respect to anxiety, mindfulness again partially mediated the association between changes in avoidant attachment and anxiety, while changes in secure and attachment anxiety were not related to changes in anxiety, and therefore were not examined in the mediation analysis.

In addition, our study partially supported the alternative hypothesis of Ryan et al. (2007), that mindfulness and attachment work bidirectionally to enhance psychological functioning. This hypothesis was supported for depression; we found a bidirectional, inverse association, between mindfulness and avoidant attachment, as each factor (e.g. mindfulness or avoidant attachment) was found to influence the association between the other factor (e.g. mindfulness or avoidant attachment) and depression, while also by itself contributing to changes in depression (Model depicted in Figure 4). This bidirectional influence, however, was not found for anxiety; while mindfulness partially mediated the association between decreases in avoidant attachment and decreases in anxiety, the association between increases in mindfulness and reductions in anxiety was not influenced by the simultaneous decreases in avoidant attachment (Model depicted in Figure 5). This finding suggests that increases in mindfulness not only directly reduces anxiety, but also helps reduce avoidant attachment tendencies, which contributes to further reductions in anxiety. Thus, increased mindfulness may be central to reducing anxiety, while both increased mindfulness, and reduced avoidant attachment, may drive reductions in depression.

Comparing the Clinical and Class Samples

While the results of the clinical and class sample must be approached with caution as the class sample used depressed and anxious mood rather than clinical depression and anxiety as dependent variables, there were several noteworthy findings. First, in the class sample, attachment anxiety and secure attachment were predictors of both short (biweekly) and long term (five week) changes in depressed and anxious mood, whereas in the clinical sample, avoidant attachment was the strongest predictor of depression and anxiety. This finding highlights the unique importance that reductions in avoidant attachment behaviors have to the therapeutic process. Secondly, in the class sample, changes in mindfulness was only predictive of changes in depressed mood, but not changes in anxious mood. As in the clinical sample, mindfulness was not predictive of long-term changes in depressed mood. Lastly, as in the clinical sample, there was a bidirectional association between mindfulness and at least one attachment factor; however, in the class sample the bidirectional association was to secure and attachment anxiety, rather than to avoidant attachment. Furthermore, in contrast to the clinical study in which mindfulness and avoidant attachment both influenced the other factor's association with reductions in depression, the association between changes in anxious and secure attachment and depression was not influenced by changes in mindfulness (Figure 6). In summary, daily fluctuations in mood were best predicted by associated changes in anxious and secure attachment. This differed starkly from the results in therapy, where changes in avoidant attachment and mindfulness were most predictive of reductions in clinical depression and anxiety. These findings likely relate to differences in avoidance/approach patterns in clinical college populations, as compared to college students in general. While college students in general may be able to successfully manage naturally occurring fluctuations in levels of anxiety and sadness, those already struggling with clinical levels of depression and anxiety, may resort to avoidant interpersonal

patterns in order to manage overwhelming levels of anxiety and depression.

Limitations

The SAAM is a new and unique measure of state attachment, and its construct validity or test-retest validity has not been extensively studied. The lack of evidence for the psychometric strength of this measure limits both the internal and external validity of findings relating to state attachment. Second, the drop-out rate (24 of 52) hinders our ability to generalize the findings to other clinical college populations, as our sample may differ significantly from those who dropped out. Post-hoc ANOVAS however, indicated no statistical differences on trait measures of depression, anxiety, mindfulness, or adult attachment. Thirdly, the homogeneity of our sample (female and white) limits the ability to generalize the findings to more diverse clinical college populations. Fourth, the correlation design and our lack of a true control group, limit our ability to test mindfulness and attachment causally, as common factors of therapeutic outcome in college counseling centers. Furthermore, the small sample size, 28 participants, used in the clinical sample, limits our statistical power and our ability to use more advanced statistical models that could allow us to make more causal claims as to the role of mindfulness and attachment as common factors. Fifth, the level of functioning of participants was only measured at the commencement of therapy, which limits our ability to understand how the therapeutic process may influence the natural fluctuations in psychological functioning. Lastly, the slight differences in design and measures used in the clinical and class samples, limits our ability to make direct comparisons between the two samples.

Future Directions for Research

Future studies should utilize experimental designs with wait list control groups, in order to be able to test empirically the mechanisms by which therapy across treatment modalities influences the association between mindfulness, attachment, and therapeutic outcome. Future

studies that incorporate larger sample sizes and latent growth curve models, may be able to test more directly the causal association between changes in mindfulness and attachment styles and changes in psychological functioning. Designs which begin collecting psychological measurements prior to the start of therapy, will allow researchers to contrast changes in mindfulness, attachment, and psychological functioning when clients are engaged in therapy, with time periods when they are not seeing a therapist. Future research on the construct validity of the SAAM or other measures of state attachment, will help establish how changes in attachment are associated with therapeutic outcome. Lastly, researchers should use similar methodology and measures in a non-clinical sample in order to study how naturally occurring changes in levels of mindfulness and attachment styles differ from changes that occur in a clinical setting.

Implications for Research

The current work was inspired by a combination of: the research of Wampold (2001), which, in showing no differences in the effectiveness of competing theories of psychotherapy, has called into question assumptions about how and why therapy works; common factors research which emphasizes process variables to the exclusion of factors internal to the client; and finally the undefined and untested nature of the description of clients as creative self healers by Hubble et al. (1999) and Tallman and Horvath (1999) and Miller (2008). The results of the current study suggest that mindfulness and attachment, in particular reductions in avoidant attachment, are significant internal client factors that may plausibly explain the consistently similar outcomes achieved across therapeutic modalities. Additionally, these constructs may provide the scientific explanation for the description by Hubble et al. (1999) of clients as creative self-healers, as both mindfulness and attachment have been shown to relate to positive psychological outcomes independent of therapy. The results, in conjunction with concerns raised

by common factors theorists such as Castonguay (2000), suggest that future research should focus on commonalities in client factors across therapeutic modalities. In particular, more research is needed to better understand how increases in mindfulness and reductions in avoidant attachment influence psychological health, within the context of therapy.

Our study found that reductions in avoidant attachment, rather than changes in other attachment styles, were particularly related to changes in both depression and anxiety. This finding is consistent with behavioral theories of therapeutic change, which posit that exposure to feared stimuli (in this case relational stimuli), and an accompanying reduction in avoidant behaviors, is linked to positive therapeutic outcomes (Hopko et al., 2003; Lejuez et al. 2001). Consistent again with behavioral theories of change, the associations between both anxious and secure attachment and depression, were explained away by increases in mindfulness, suggesting that changes in secure and attachment anxiety were epiphenomena that coincide with reductions in depression, but are not in and of themselves the catalyst for therapeutic change. This finding within the clinical sample was in stark contrast to our findings in the class sample, where natural fluctuations (independent of any intentional psychological intervention) in secure and attachment anxiety were predictive of reductions in both depressed and anxious mood. As the class sample used depressed and anxious mood, rather than clinical depression and anxiety, as dependent variables, it is not clear whether these different results were substantively significant or were due to differing measures used. However, these findings do suggest that therapy may be beneficial in part, because by providing a safe environment, it allows clients to move towards and face their anxiety, thus helping to overcome the natural human tendency to avoid painful stimuli.

In addition to the finding that moving toward, rather than away from, feared attachments is central to therapeutic change, our study also underscores the importance of increased mindfulness skills within the therapeutic association. The clinical sample highlighted the unique

role mindfulness plays in a clinical setting, as a significant correlation was found between changes in mindfulness and depression in the clinical setting, while that correlation was partially explained away in the class setting by changes in anxious and secure attachment. Additionally, the salutary role of mindfulness was found to be particularly useful in providing short term therapeutic reductions in depression, as compared to changes in avoidant attachment which had a more long term effect.

Our mediation analysis helped us to further understand how changes in our common factors, mindfulness and avoidant attachment, interacted to bring about therapeutic change. Our findings indicate that increases in mindfulness and reductions in avoidant attachment work bidirectionally to reduce clinical depression and that each factor acts both to influence the association between the other factor and depression, and also to reduce depression independent of the other factor (see Figure 4). Interestingly, a different association was found with respect to anxiety, where mindfulness was found to influence the association between reductions in avoidant attachment and reductions in anxiety, while it acted completely independently from changes in attachment, in influencing reductions in anxiety.

Future research may help explain why and how mindfulness and avoidant attachment, as common factors, influence depression and anxiety differently. One plausible explanation is that depression might be rooted in a struggle to find a balance between self and other, to be able to both relate to one's community and still maintain a feeling of autonomy and independence, while anxiety may be a more individual struggle to avoid danger and/or death. Below we postulate, based on the theoretical roots of the studies, how mindfulness and attachment may interact to reduce symptoms of depression and anxiety.

Interestingly, this same self versus other quandary that arises in relation to depression, has been described by Shaver et al. (2007) and Ryan et al. (2007), with respect to the distinction

between secure attachment and mindfulness. Attachment can be seen as an interpersonal skill, how one feels about, and interacts with others, while mindfulness is an intrapersonal skill, describing a process of relating to one's own experiences. Both authors argue for the interdependence of these psychological phenomena, while also emphasizing their uniqueness. Shaver et al. (2007), writing from an attachment perspective, argues that the Buddhist traditions from which mindfulness emerged, were anchored within the social context of a community of practitioners, while Ryan et al. (2007) an existential theorist, emphasizes the importance of autonomy and independence even within social relationships, pointing out that, like all things, relationships end (i.e. people die and break up) but that one's capacity to be mindful lives on. Our data indicate that the intrapersonal (mindfulness), and the interpersonal (attachment) work simultaneously, feeding off each other, to bring about reductions in depression. As clients reduce avoidant relational tendencies and form more secure relationships (often with their therapist), they also become less avoidant and more mindful of their own internal experiences. Likewise, as they become more mindful of their internal experiences, they likely feel more comfortable connecting with others. Siegel (2007), makes a similar argument from a neuropsychological perspective, positing that secure attachment and the related state of attunement, are associated with the same brain structures as mindfulness.

Anxiety on the other hand, seems to be associated with an evolutionary tendency to avoid danger, and its prevalence in modern man likely relates to its importance in protecting our ancestors from predators. While forming close connections with others helps to reduce anxiety, in that communities provide both physical connection and access to food, no community can completely shield its members from being picked out of the herd by the metaphorical lion. Thus, anxiety may be inherently more individual in nature than depression. This conclusion makes intuitive sense in the real world, as even having my securely attached girlfriend or my mother

present when I'm confronted by a bear, or when I defend this dissertation, will certainly not fully relieve my anxiety. Because of this, the intrapersonal skill of mindfulness may be central to reducing anxiety, by helping clients decenter from their experience of fear, so that they're more able to intentionally choose how to act, rather than automatically following their tendency to want to run from danger, whether it be from a bear or from an anxiety provoking public speaking engagement.

This may be particularly important in light of our knowledge of anxiety patterns. While avoidant behaviors, such as skipping preparation for one's dissertation defense, work in the short term to reduce immediate anxiety, in the long run, they function to maintain anxiety by creating a psychological connection between avoidance and immediate relief, even if the anxiety stimulus is known to be benign. Attachment, therefore, may have a less important role in reducing anxiety than mindfulness. Social supports certainly can provide a base from which individuals can feel comfort in knowing that others are supporting their efforts to live and prosper. However, increases in mindfulness may provide the reflective skills necessary to choose when to seek support and when, seeking support may be its own form of experiential avoidance. This pattern may differ when the feared stimuli is relational.

From a neuropsychological perspective, insecure attachment has been linked to reduced activity in the left frontal cortex, a part of the brain associated with positive affect and approach behaviors. Mindfulness and meditation on the other hand, have been associated with more broad activation of the frontal cortex, and an ability to regulate activity in the amygdala and other emotion centers. This suggests that increases in mindfulness might be a more useful interpsychic tool for managing present anxiety, while changes in attachment may be more closely linked to approach behaviors and seeking out situations, associated with positive affect. Our finding as to the relative importance to psychological health of reducing avoidant attachment and

increasing mindfulness, both of which require moving towards and enhancing relational and intrapersonal experiences, as opposed to explicitly changing internal experiences (measured in this study by secure and attachment anxiety) is in line with behavioral theories which in some cases recommend increasing a client's short term discomfort in order to achieve long term benefits. For example, Acceptance and Commitment Therapy (Hayes et al., 2003), a theoretical orientation which borrows heavily from both existential and behavioral theory, shifts the emphasis from always reducing symptoms, sometimes advocating the acceptance of even unpleasant emotional experiences (including attachment threats) when acting in accordance with one's true core values. Our data does indicate however, that mindfulness and attachment predict therapeutic outcome across treatment modalities. It may be that all major schools of therapy are effective in part due to the reshaping of relational and attachment patterns, as well as by helping clients to form more mindful patterns of relating to their own internal experiences.

Implications for Practice

The results of our study suggest that mindfulness and attachment are common factors of therapeutic change that may work across treatment modalities to bring about therapeutic change. Therapists may benefit from this research by explicitly focusing on helping clients to develop mindfulness and more secure attachment styles, although more research is needed to determine if making these constructs a specific focus of therapy will significantly improve these skills, and/or lead to better therapeutic outcomes. Furthermore, assessing mindfulness and attachment styles may aid therapists to accurately conceptualize their clients, although once again more research is needed in this area. The study found that, of the attachment factors reducing avoidant attachment was particularly linked to reductions in both depression and anxiety, suggesting that therapists may achieve positive outcomes by focusing on avoidant interpersonal tendencies, and attempting to create safe exposures to internal attachment anxieties, just as behaviorally based therapists

intentionally expose clients to external anxiety provoking stimuli (Mineka & Thomas, 2005).

More specifically, a focus on altering avoidant attachment tendencies, both in the short and long term, may be most important when working with depressed client, as avoidance of relationship may be central to their struggle.

Cultivating mindfulness in clients may be a useful tool both for reducing short term depression and for helping to rework maladaptive avoidant attachment patterns, in service of producing long term reductions in depression. Additionally, helping clients to become more mindful may be extremely important when working with anxiety, especially with anxiety that is not relational in nature. Mindfulness may be thought of as a means of helping clients to sit with their own internal experiences in a more intentional and open manner and in this way may be analogous to helping clients develop the skill of creating internal exposures, just as behavioral therapist create external exposures.

Mcbride et al. (2006) study indicates that for extremely avoidant, depressed clients more structured and directive interventions such as CBT may be more effective then less directive interventions. As theorized by Martin (1997) this pattern may hold for clients very low in mindfulness. Assessing mindfulness and avoidant attachment may therefore be extremely useful in tailoring therapy to meets the unique needs of the client.

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Table 1

Hierarchical Models Predicting Biweekly Changes in Depression

Variable	β	Standard error	Z-Value	95% Confidence interval	
				Lower	Upper
Model 1					
Intercept	-.01	.05	-.20		
Anxious	.10***	.02	4.62	.059	.147
Avoidant	.26***	.03	7.96	.199	.329
Secure	-.18***	.03	-5.54	-.244	-.116
Model 2					
Intercept	-.02	.05	-.34		
Mindfulness	-.36***	.02	-18.46	-.402	-.324
Model 3					
Intercept	-.03	.05	-.57		
Good	-.78***	.09	-9.08	-.947	-.610
Bad	.32***	.07	4.91	.194	.452
Anxious	.05**	.02	2.62	.014	.096
Avoidant	.20***	.03	6.30	.135	.256
Secure	-.06*	.03	-2.06	-.126	-.003
Model 4					
Intercept	-.03	.04	-.64		
Good	-.62***	.08	-7.46	-.778	-.454
Bad	.24***	.06	3.82	.116	.361

Mindfulness	-.26***	.02	-11.79	-.302	-.216
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Model 5

Intercept	-.02	.04	-.36		
Good	-.58***	.08	-6.97	-.737	-.414
Bad	.18**	.06	2.88	.058	.305
Anxious	.03	.02	1.41	-.011	.067
Avoidant	.14***	.03	4.91	.087	.202
Secure	.01	.03	.30	-.050	.068
Mindfulness	-.23***	.02	-9.88	-.274	-.183

Note. β = beta hat. N=27. * $p < .05$. ** $p < .01$, *** $p < .001$. Confidence interval refers to the values obtain when variables one standard deviation below and above the mean were inserted into the regression equation. Model 1, convergence reached in 3 iterations. Log likelihood deviance = 2134.39, free parameters = 6. Model 2, convergence reached in 3 iterations. Log likelihood deviance = 2029.28, free parameters = 4. Model 3, convergence reached in 2 iterations. Log likelihood deviance = 2016.58, free parameters = 8. Model 4, convergence reached in 3 iterations. Log likelihood deviance = 1951.09, free parameters = 6. Model 5, convergence reached in 3 iterations. Log likelihood deviance = 1924.92, free parameters = 9.

Table 2

Hierarchical Models Predicting Biweekly Changes in General Anxiety

Variable	β	Standard error	Z-Value	95% Confidence interval	
				Lower	Upper
Model 1					
Intercept	-.01	.05	-.16		
Anxious	.05*	.02	2.50	.011	.092
Avoidant	.18***	.03	5.84	.119	.240
Secure	-.02	.03	-.80	-.083	.035
Model 2					
Intercept	-.01	.05	-.30		
Mindfulness	-.17***	.02	-8.69	-.207	-.131
Model 3					
Intercept	-.01	.04	-.29		
Good	-.27**	.08	-3.26	-.433	-.108
Bad	.42***	.06	6.64	.298	.547
Anxious	.01	.02	.60	-.028	.052
Avoidant	.13***	.03	4.25	.069	.186
Secure	.05	.03	1.63	-.010	.109
Model 4					
Intercept	-.02	.04	-.37		
Good	-.18*	.08	-2.14	-.344	-.015
Bad	.38***	.06	5.95	.253	.502

Mindfulness	-.09***	.02	-4.20	-.138	-.050
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Model 5

Intercept	-.01	.04	-.19		
Good	-.19*	.08	-2.24	-.356	-.024
Bad	.37***	.06	5.66	.239	.492
Anxious	.00	.02	.06	-.038	.041
Avoidant	.11***	.03	3.56	.048	.166
Secure	.08*	.03	2.54	.018	.139
Mindfulness	-.09***	.02	-3.83	-.138	-.045

Note. β = beta hat. N=27. * $p < .05$. ** $p < .01$, *** $p < .001$. Confidence interval refers to the values obtain when variables one standard deviation below and above the mean were inserted into the regression equation. Model 1, convergence reached in 3 iterations. Log likelihood deviance = 2028.22, free parameters = 6. Model 2, convergence reached in 3 iterations. Log likelihood deviance = 2010.41, free parameters = 4. Model 3, convergence reached in 3 iterations. Log likelihood deviance = 1964.67, free parameters = 8. Model 4, convergence reached in 3 iterations. Log likelihood deviance = 1965.43, free parameters = 6. Model 5, convergence reached in 3 iterations. Log likelihood deviance = 1949.80, free parameters = 9.

Table 3

Correlational Matrix for Relationship between Overall Change Slope and Pre-Post Difference Scores

	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	.34*	1									
3	-.41**	.23	1								
4	.57**	.15	-.28	1							
5	-.26	.44**	.60***	.08	1						
6	-.35*	.26	.68***	-.30	.83***	1					
7	-.02	.09	.15	-.09	.04	.04	1				
8	.28	-.08	-.02	.00	.10	.07	.28	1			
9	.03	-.18	-.09	.51**	-.21	-.14	.02	.20	1		
10	-.07	.24	.51**	-.29	.51**	.48**	.38*	.12	-.32*	1	
11	-.15	.44**	.49**	-.41*	.26	.43*	.16	-.06	-.17	.45**	1

Note. Pearson correlations. N=28. * $p < .05$. ** $p < .01$, $p < .001$.

1. Slope secure attachment
2. Slope attachment anxiety
3. Slope avoidant attachment
4. Slope mindfulness
5. Slope depression

6. Slope general anxiety
7. Pre-post difference attachment anxiety
8. Pre-post difference avoidant attachment
9. Pre-post difference mindfulness
10. Pre-post difference depression
11. Pre-post difference anxiety

Table 4

Hierarchical Models Predicting Biweekly Changes in Attachment and Mindfulness

Variable	β	Standard error	Z-Value	95% Confidence interval	
				Lower	Upper
Model 1- Mindfulness					
Intercept	.03	.08	.38		
Avoidant	-.33***	.05	-6.27	-.426	-.224
Anxious	-.19***	.03	-5.50	-.260	-.124
Secure	.48***	.05	9.47	.382	.580
Model 2- Secure					
Intercept	.01	.06	.24		
Mindfulness	.34***	.03	13.32	.289	.389
Model 3- Avoidant					
Intercept	-.09	.06	-1.45		
Mindfulness	-.28***	.03	-10.70	-.326	-.225
Model 4- Anxious					
Intercept	-.03	.09	.289		
Mindfulness	-.24***	.04	-6.36	-.308	-.163

Note. β = beta hat. N=27. * p < .05. ** p < .01, *** p < .001. Confidence interval refers to the values obtain when variables one standard deviation below and above the mean were inserted into the regression equation. Model 1, convergence reached in 3 iterations. Log likelihood deviance = 2705.99, free parameters = 6. Model 2, convergence reached in 3 iterations. Log likelihood deviance = 2360.43, free parameters = 4. Model 3, convergence reached in 2 iterations. Log likelihood deviance = 2379.48, free parameters = 4. Model 4, convergence reached in 3 iterations. Log likelihood deviance = 2842.32, free parameters = 4.

Table 5

Hierarchical Models Predicting Biweekly Changes in Depressed Mood

Variable	β	Standard error	Z-Value	95% Confidence interval	
				Lower	Upper
Model 1					
Intercept	-.01	.01	-.47		
Anxious	.12***	.01	8.66	.091	.145
Avoidant	.02	.02	1.29	-.012	.057
Secure	-.20***	.01	-14.13	-.232	-.175
Model 2					
Intercept	-.02	.02	-.983		
Mindfulness	-.09***	.01	-6.60	-.111	-.060
Model 3					
Intercept	-.01	.01	-.74		
Good	-.08***	.01	-8.91	-.096	-.062
Bad	.12***	.01	10.63	.097	.141
Anxious	.10***	.01	8.19	.079	.128
Avoidant	.01	.02	.41	-.025	.038
Secure	-.15***	.01	-10.77	-.176	-.122
Model 4					
Intercept	-.02	.01	-1.10		
Good	-.10***	.01	-10.65	-.118	-.081
Bad	.15***	.01	12.38	.123	.169

Mindfulness	-.05***	.01	-3.90	-.069	-.023
<hr/>					
Model 5					
<hr/>					
Intercept	-.01	.01	-.83		
Good	-.08***	.01	-8.69	-.095	.060
Bad	.12***	.01	10.51	.096	1.39
Anxious	.10***	.01	8.09	.077	.127
Avoidant	.01	.02	.40	-.025	.038
Secure	-.15***	.01	-10.38	-1.73	-.118
Mindfulness	-.02	.01	-1.71	-.041	.003

Note. β = beta hat. N=27. * $p < .05$. ** $p < .01$, *** $p < .001$. Confidence interval refers to the values obtain when variables one standard deviation below and above the mean were inserted into the regression equation. Model 1, convergence reached in 5 iterations. Log likelihood deviance = 1994.05, free parameters = 6. Model 2, convergence reached in 4 iterations. Log likelihood deviance = 2255.56, free parameters = 4. Model 3, convergence reached in 5 iterations. Log likelihood deviance = 1790.78, free parameters = 8. Model 4, convergence reached in 5 iterations. Log likelihood deviance = 1971.86, free parameters = 6. Model 5, convergence reached in 5 iterations. Log likelihood deviance = 1787.83, free parameters = 9.

Table 6

Hierarchical Models Predicting Biweekly Changes in Anxious Mood

Variable	β	Standard error	Z-Value	95% Confidence interval	
				Lower	Upper
Model 1					
Intercept	.02	.02	1.41		
Anxious	.07***	.02	4.75	.043	.104
Avoidant	.03	.02	1.56	-.008	.070
Secure	-.10***	.02	-6.27	-.135	-.071
Model 2					
Intercept	.02	.02	.92		
Mindfulness	-.07***	.01	-5.25	-.098	-.045
Model 3					
Intercept	-.02	.02	1.30		
Good	-.06***	.01	-5.89	-.083	-.042
Bad	.09***	.01	6.77	.064	.116
Anxious	.06***	.02	4.17	.033	.092
Avoidant	.02	.02	.98	-.019	.056
Secure	-.06***	.02	-3.68	-.093	-.028
Model 4					
Intercept	.02	.02	0.97		
Good	-.07***	.01	-6.53	-.089	-.048
Bad	.10***	.01	7.72	.076	.128

Mindfulness	-.04***	.01	-3.33	-.070	-.018
<hr/>					
Model 5					
<hr/>					
Intercept	.02	.02	1.18		
Good	-.06***	.01	-5.62	-.080	-.039
Bad	.09***	.01	6.61	.062	.114
Anxious	.06***	.02	4.03	.031	.090
Avoidant	.02	.02	0.98	-.019	.056
Secure	-.05**	.02	-3.26	-.087	-.022
Mindfulness	-.03*	.01	-2.42	-.058	-.006

Note. β = beta hat. N=27. * $p < .05$. ** $p < .01$, *** $p < .001$. Confidence interval refers to the values obtain when variables one standard deviation below and above the mean were inserted into the regression equation. Model 1, convergence reached in 3 iterations. Log likelihood deviance = 2323.02, free parameters = 6. Model 2, convergence reached in 3 iterations. Log likelihood deviance = 2377.34, free parameters = 4. Model 3, convergence reached in 3 iterations. Log likelihood deviance = 2232.75, free parameters = 8. Model 4, convergence reached in 3 iterations. Log likelihood deviance = 2259.78, free parameters = 6. Model 5, convergence reached in 3 iterations. Log likelihood deviance = 2226.80, free parameters = 9.

Table 7

Correlational Matrix for Relationship between Overall Change and Pre-Post Difference Scores

	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	-.25*	1									
3	-.30**	.03	1								
4	.02	.001	.05	1							
5	-.33**	.44**	.05	.08	1						
6	-.24*	.29**	.21	.06	.43**	1					
7	-.09	-.12	-.17	.13	-.02	-.08	1				
8	-.29**	-.04	.15	-.01	-.02	.01	.44**	1			
9	-.15	-.08	.25*	.07	-.05	.13	.06	.40**	1		
10	-.10	.03	.10	.01	.02	-.30	.03	.31**	.70**	1	
11	-.03	-.12	-.01	-.13	-.11	-.30**	.02	-.05	-.25*	-.25*	1

Note. Pearson correlations. N=81. * $p < .05$. ** $p < .01$.

1. Slope secure attachment
2. Slope attachment anxiety
3. Slope avoidant attachment
4. Slope mindfulness
5. Slope depressed mood
6. Slope anxious mood
7. Pre-post difference avoidant attachment

8. Pre-post difference attachment anxiety
9. Pre-post difference anxiety
10. Pre-post difference depression
11. Pre-post difference mindfulness

Table 8

Hierarchical Models Predicting Biweekly Changes in Attachment and Mindfulness

Variable	β	Standard error	Z-Value	95% Confidence interval	
				Lower	Upper
Model 1- Mindfulness					
Intercept	-.06	.03	-1.91		
Secure	.24***	.03	7.31	.178	.308
Avoidance	-.01	.04	-.32	-.091	.066
Anxious	-.07*	.03	-2.37	-.136	-.013
Model 2- Secure					
Intercept	.01	.03	.36		
Mindfulness	.19***	.02	8.00	.142	.234
Model 3- Avoidant					
Intercept	-.06*	.02	-2.42		
Mindfulness	-.06**	.02	-2.82	-.094	-.017
Model 4- Anxious					
Intercept	-.03	.03	-.89		
Mindfulness	-.07**	.02	-3.03	-.120	-.026

Note. β = beta hat. N=27. * $p < .05$. ** $p < .01$, *** $p < .001$. Confidence interval refers to the values obtain when variables one standard deviation below and above the mean were inserted into the regression equation. Model 1, convergence reached in 3 iterations. Log likelihood deviance = 4190.61, free parameters = 6. Model 2, convergence reached in 2 iterations. Log likelihood deviance = 3801.24, free parameters = 4. Model 3, convergence reached in 3 iterations. Log likelihood deviance = 3351.65, free parameters = 4. Model 4, convergence reached in 4 iterations. Log likelihood deviance = 3869.14, free parameters = 4.

Figure 1

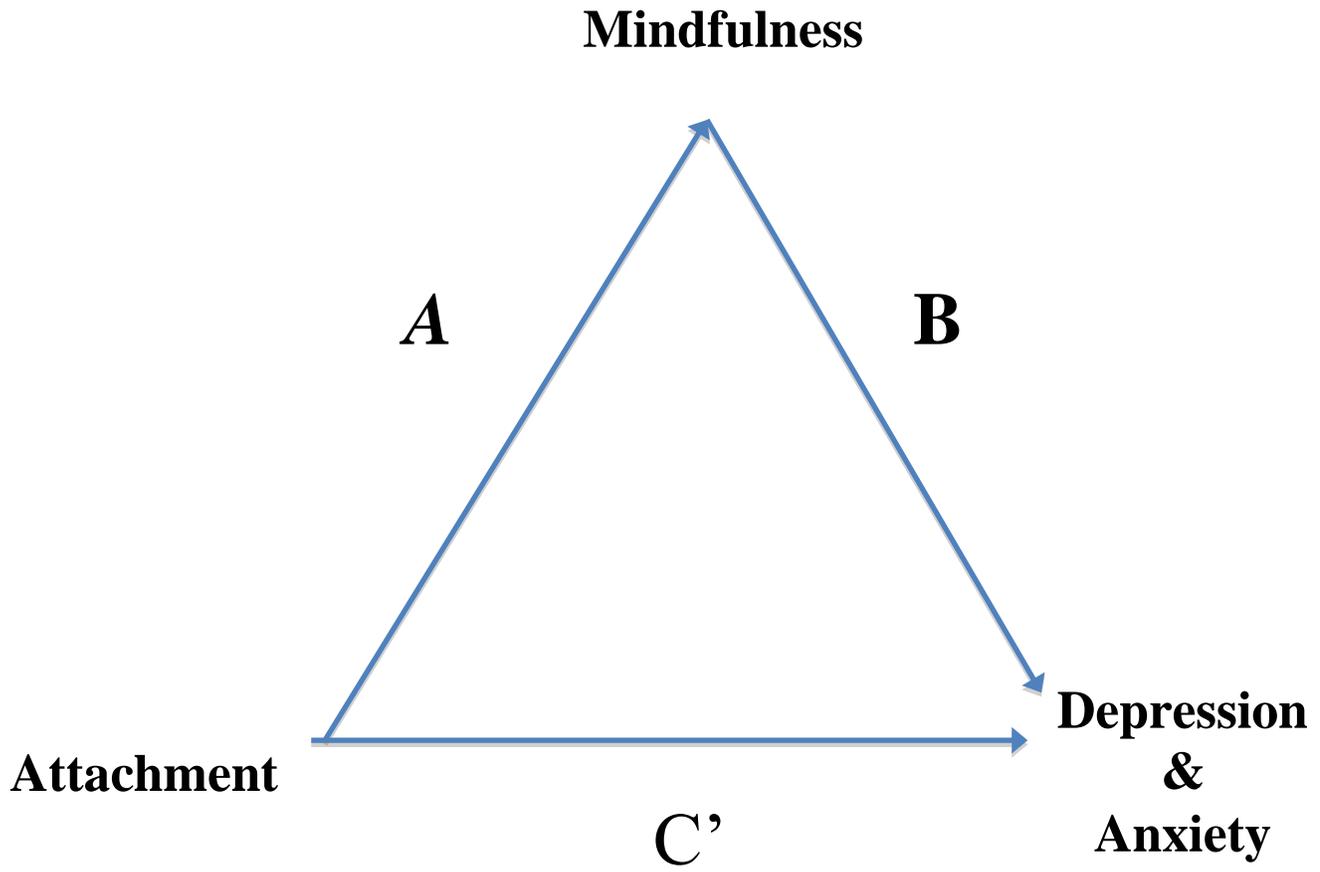


Figure 2

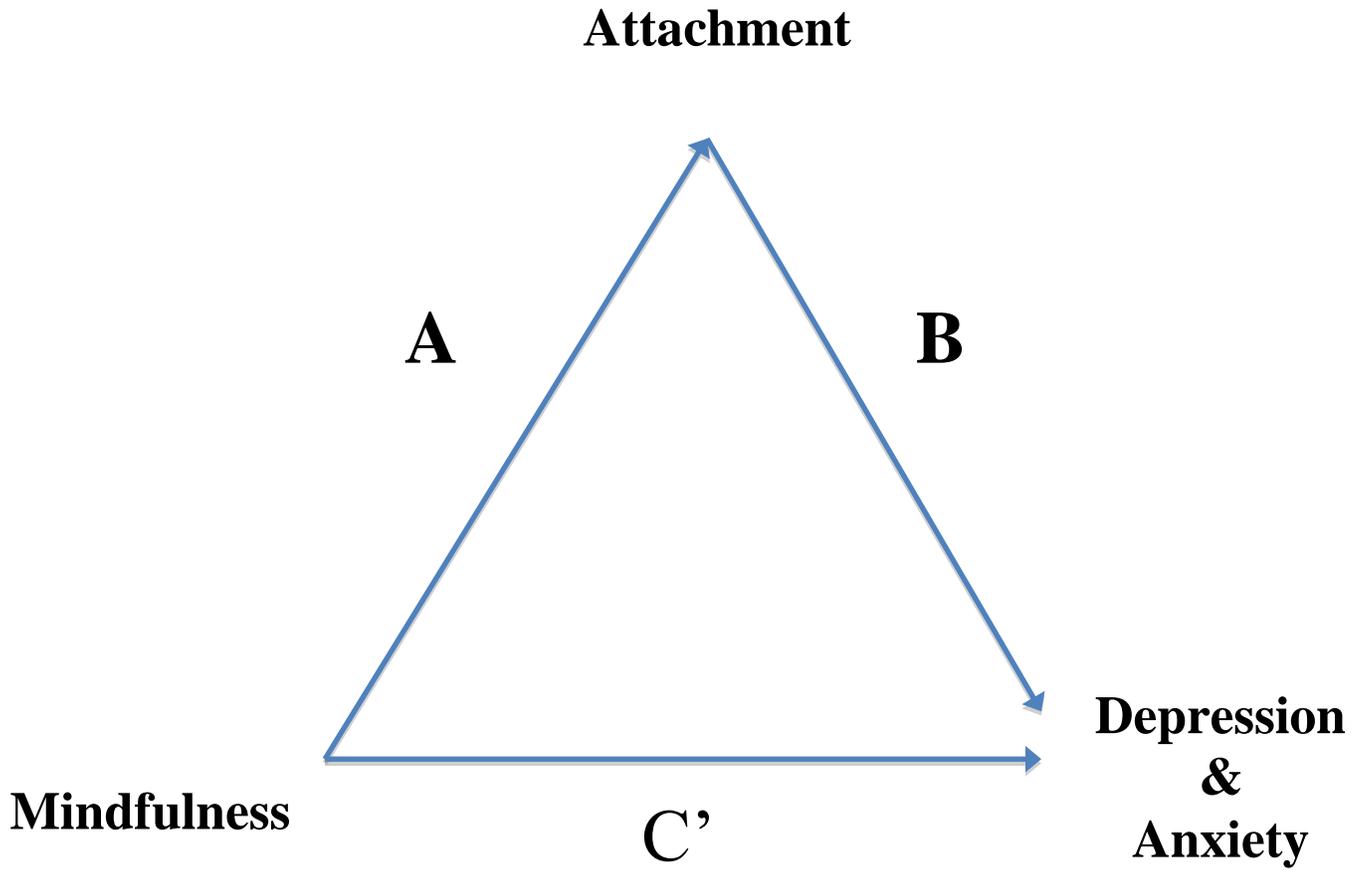
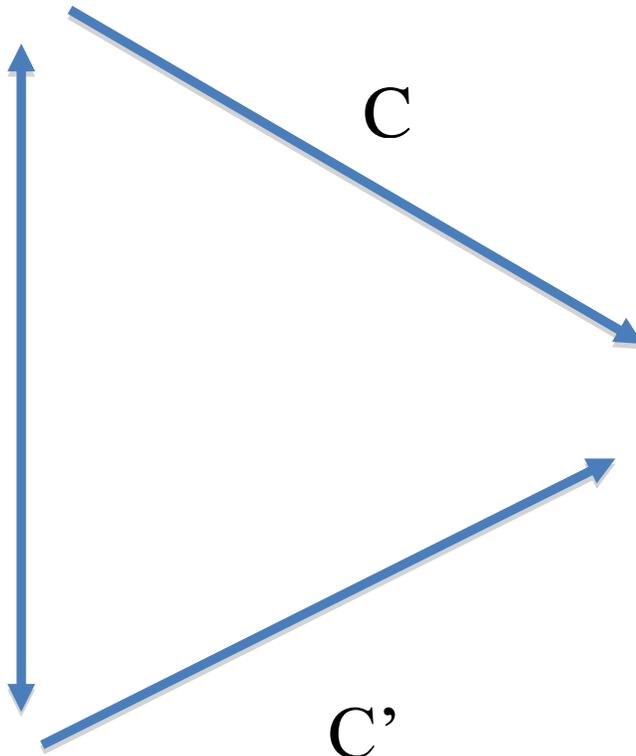


Figure 3

Mindfulness

A



**Depression
&
Anxiety**

Attachment

C'

Figure 4

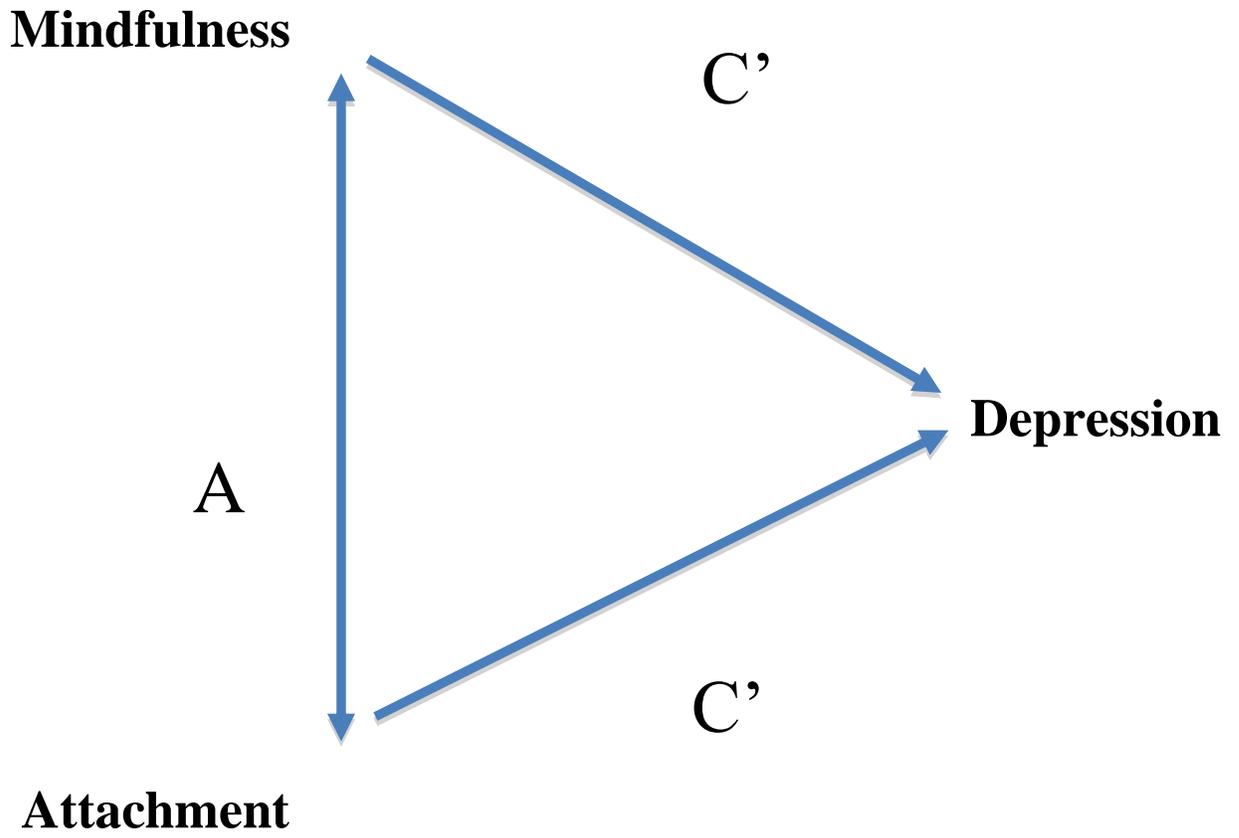


Figure 5

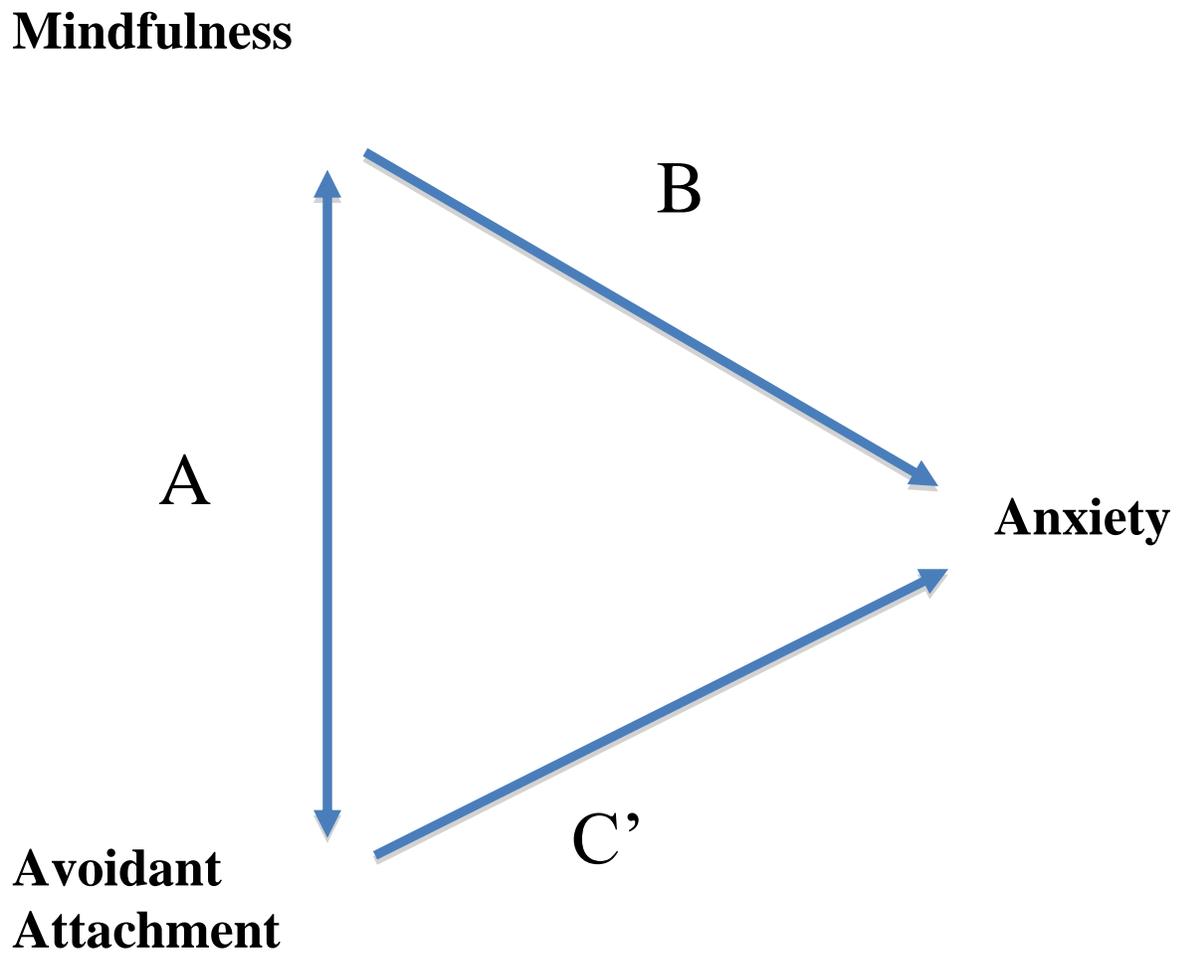
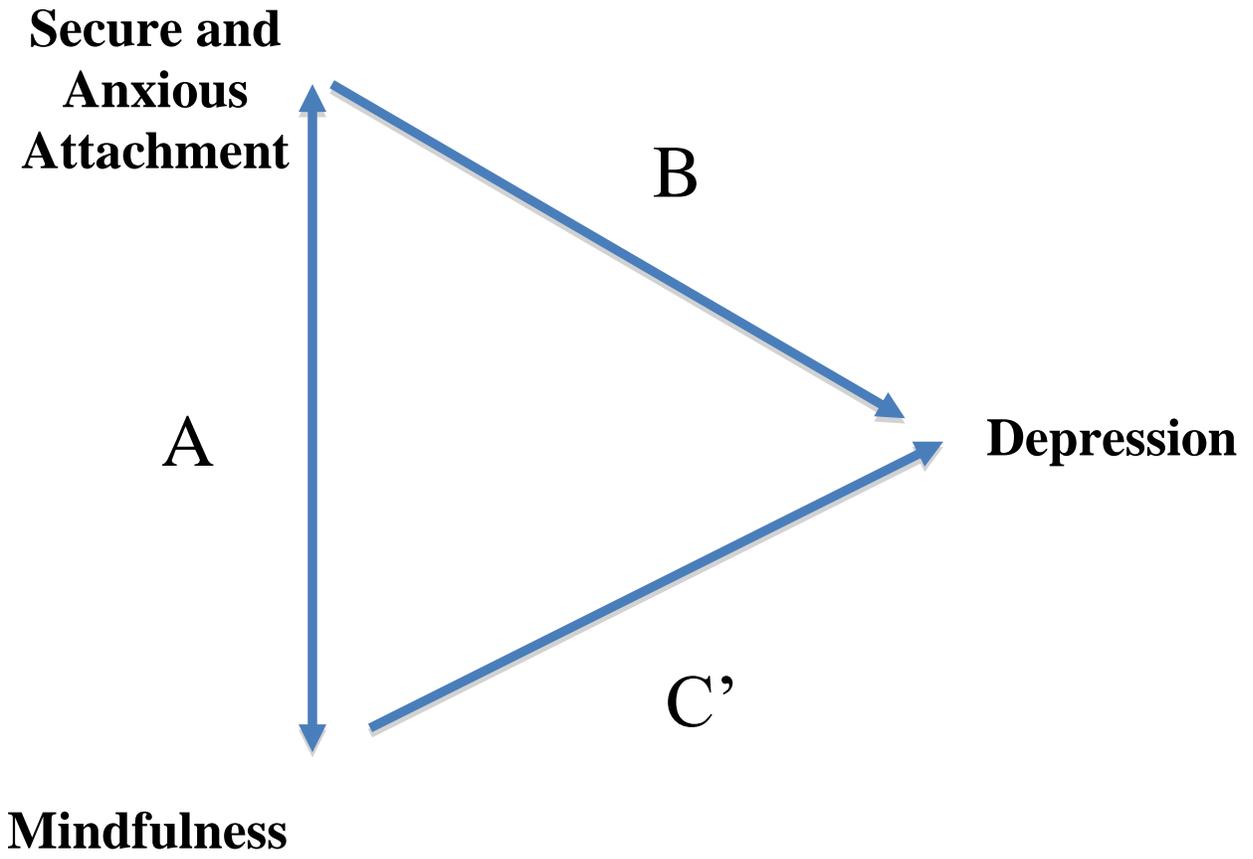


Figure 6



Appendix A

Experiences in Close Relationships Inventory

The following statements concern how you generally feel in close relationships (e.g., with romantic partners, close friends, or family members). Respond to each statement by indicating how much you agree or disagree with it. Write the number in the space provided, using the following rating scale:

1	2	3	4	5	6	7
<i>Disagree Strongly</i>	.....	.....	<i>Neutral/ Mixed</i>	.....	.....	<i>Agree Strongly</i>

- ___ 1. I prefer not to show others how I feel deep down.
- ___ 2. I worry about being rejected or abandoned.
- ___ 3. I am very comfortable being close to other people.
- ___ 4. I worry a lot about my relationships.
- ___ 5. Just when someone starts to get close to me I find myself pulling away.
- ___ 6. I worry that others won't care about me as much as I care about them.
- ___ 7. I get uncomfortable when someone wants to be very close to me.
- ___ 8. I worry a fair amount about losing my close relationship partners.
- ___ 9. I don't feel comfortable opening up to others.
- ___ 10. I often wish that close relationship partners' feelings for me were as strong as my feelings for them.
- ___ 11. I want to get close to others, but I keep pulling back.
- ___ 12. I want to get very close to others, and this sometimes scares them away.
- ___ 13. I am nervous when another person gets too close to me.
- ___ 14. I worry about being alone.
- ___ 15. I feel comfortable sharing my private thoughts and feelings with others.
- ___ 16. My desire to be very close sometimes scares people away.
- ___ 17. I try to avoid getting too close to others.
- ___ 18. I need a lot of reassurance that close relationship partners really care about me.
- ___ 19. I find it relatively easy to get close to others.
- ___ 20. Sometimes I feel that I try to force others to show more feeling, more commitment to our relationship than they otherwise would.
- ___ 21. I find it difficult to allow myself to depend on close relationship partners.
- ___ 22. I do not often worry about being abandoned.
- ___ 23. I prefer not to be too close to others.
- ___ 24. If I can't get a relationship partner to show interest in me, I get upset or angry.
- ___ 25. I tell my close relationship partners just about everything.
- ___ 26. I find that my partners don't want to get as close as I would like.
- ___ 27. I usually discuss my problems and concerns with close others.
- ___ 28. When I don't have close others around, I feel somewhat anxious and insecure.
- ___ 29. I feel comfortable depending on others.

- ___ 30. I get frustrated when my close relationship partners are not around as much as I would like.
- ___ 31. I don't mind asking close others for comfort, advice, or help.
- ___ 32. I get frustrated if relationship partners are not available when I need them.
- ___ 33. It helps to turn to close others in times of need.
- ___ 34. When other people disapprove of me, I feel really bad about myself.
- ___ 35. I turn to close relationship partners for many things, including comfort and reassurance.
- ___ 36. I resent it when my relationship partners spend time away from me.

Appendix B

5-FACTOR Mindfulness Questionnaire

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	
never or very rarely true	rarely true	sometimes true	often true	very oft

- _____ 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.

PLEASE TURN OVER

1	2	3	4	
never or very rarely true	rarely true	sometimes true	often true	very oft

- _____ 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.

DASS₂₁

Name:

Date:

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

The rating scale is as follows:

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical	0	1	2	3

exertion (eg, sense of heart rate increase, heart missing a beat)					
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Appendix D
Cognitive and Affective Mindfulness Scales- Revised

People have a variety of ways of relating to their thoughts and feelings. For each of the items below, rate how much each of these applied to you over the past day.

	1. Rarely/Not at all	2. Sometimes	3. Often	4. Almost always
1. It was easy for me to concentrate on what I was doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I was preoccupied by the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I could tolerate emotional pain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I could accept things I could not change.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I could describe how I felt in the moment in considerable detail.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I was easily distracted.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I was preoccupied by the past.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. It was easy for me to keep track of my thoughts and feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I tried to notice my thoughts without judging them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I was able to accept the thoughts and feelings I had.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I was able to focus on the present moment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I was able to pay close attention to one thing for a long period of time.	<input type="radio"/>	<input type="radio"/>		

Appendix E

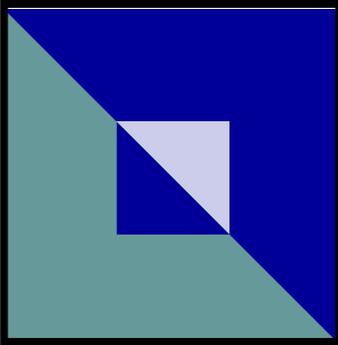
SAAM

The following statements concern how you feel **right now**. Please respond to each statement by indicating how much you agree or disagree with it as it reflects your **current** feelings. Please circle the number on the 1-to-7 scale that best indicates how you feel at the moment:

1	2	3	4	5	6	7
<i>Disagree Strongly</i>	.....	.....	<i>Neutral/Mixed</i>	.....	.....	<i>Agree Strongly</i>

Right now...

1. I wish someone would tell me they really love me
2. I would be uncomfortable having a good friend or a relationship partner close to me
3. I feel alone and yet don't feel like getting close to others
4. I feel loved
5. I wish someone close could see me now
6. If something went wrong right now I feel like I could depend on someone
7. I feel like others care about me
8. I feel a strong need to be unconditionally loved right now
9. I'm afraid someone will want to get too close to me
10. If someone tried to get close to me, I would try to keep my distance
11. I feel relaxed knowing that close others are there for me right now
12. I really need to feel loved right now
13. I feel like I have someone to rely on
14. I want to share my feelings with someone
15. I feel like I am loved by others but I really don't care
16. The idea of being emotionally close to someone makes me nervous
17. I want to talk with someone who cares for me about things that are worrying me
18. I feel secure and close to other people
19. I really need someone's emotional support
20. I feel I can trust the people who are close to me
21. I have mixed feelings about being close to other people



Diary study assessing Therapy

KU THE UNIVERSITY OF
KANSAS

Counseling and Psychological Services
and the Department of Psychology

Dear Potential Participant,

Counseling and Psychological Services (CAPS), in collaboration with researchers from the Department of Psychology, is conducting a study to learn more about how people change over the course of therapy. Your participation will be valuable in helping psychologists learn how therapy works.

Specific benefits to the participant:

1. At the conclusion of the study participants may choose to receive a personalized report of their progress over the course of therapy. This can be done by sending an email to the principle investigator along with your study ID number.
2. Participants who inquire about the study, to the principal researchers, will be entered into a raffle to win an IPOD touch.

What does the study entail?

The study will last for five weeks. In the study you be will asked to take four surveys:

1. Informed consent (can't start the study without it).
2. An initial survey that takes approximately 45 minutes to complete.
3. A diary which takes 5-10 minutes. This diary will be taken before and after therapy for four weeks following the initial appointment.
4. Final survey that takes 45 minutes to complete.

A note on confidentiality:

Keeping your information secure is of utmost importance to us. If you choose to participate you will be given a study ID number which you will use instead of your name when filling out assessments. The data collected will be stored in a password secure location.

If you choose to participate you will be sent an email containing instructions.

Yes I would like to participate.

If you marked yes please provide an email address:

No thank you I would not like to participate.

Please return completed form to the receptionists.

If you have any questions about the study please don't hesitate to contact David Martin, MS at: davemart@ku.edu or Dr. Omri Gillath at: ogillath@ku.edu - 785-864-1772.

To learn more about our work please visit: <http://web.ku.edu/~gillab/>

Appendix G

Informed Consent

The Department of Psychology at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided so you can decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty.

In this study we are interested in the associations between people's attachment style and therapy. Within this study, you will be asked to fill out multiple questionnaires regarding yourself, your attachment style, your close relationships, therapy and its consequences.

We estimate that completion of this study will take less than two hours of your time over the course of therapy. Multiple questionnaires will be administered at several intervals throughout the study, but each study session would take only a few minutes. At the end of the study, you will be given complete information concerning the nature of our research and the hypotheses we are investigating. The results of this study will contribute to our general knowledge about the self and the effects of therapy. There are no apparent risks, discomforts, or benefits of any kind posed to you in this study. However, some of the questions will deal with sensitive topics such as suicide, self-worth, and control of anger.

Your participation is solicited, but is strictly voluntary. The information you provide will not include any identifying information about you other than some basic demographic information. That is, your responses will be pooled with those of others and presented as group averages.

Do not hesitate to ask questions about the study, once you have completed the questionnaires. We can assure you that your name will not be associated in any way with the research findings. Deidentified copies of questionnaires used for research purposes will be destroyed once no longer needed. Thank you very much for your cooperation.

If you have any additional questions about your rights as a research participant, you may call (785) 864-7429 or (785) 864-7385 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email dhann@ku.edu or mdenning@ku.edu.

Sincerely,

Principal investigators:

David Martin, MS, davemart@ku.edu

Omri Gillath, PhD, 518 Fraser Hall, 864-1772, ogillath@ku.edu

Signature of participant agreeing to participate

Date

With my signature I affirm that I am at least 18 years of age and have received a copy of the consent, form to keep.

Appendix H

Debriefing

Therapy and its outcomes are known to be associated with attachment style and bonds. For example, being a securely attached therapist, or providing a 'safe haven' like environment is known to be related with stronger therapeutic alliance, and higher success rate of therapy. It is unclear however, how therapy affects the sense of attachment security. In the current study, therefore, we used various measures to determine the effects of therapy on an individual's sense of attachment security and insecurity by following patients and controls (waiting list) from first approaching the clinic until the termination of therapy. The data collected from this study will be analyzed to help us evaluate whether and how exactly therapy affects people's attachment style, and specifically how their sense of security and insecurity changes due to therapy.

To test these ideas we had you fill out various self-report measures assessing your relationship/attachment style, your emotional state, and experiences with the therapist and therapy.

We respect your rights as a participant and that is why we had you sign a consent form at the beginning that included no deception and gave you the right to discontinue the experiment at anytime with no cost to you. Again the data from this study will not be linked to your name in anyway; instead your answers will be pooled with other participants' answers and presented as group averages.

If you have any further questions or concerns, please feel free to contact Dr. Omri Gillath at (785) 864-1772 or ogillath@ku.edu

Thanks for your participation!