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Dismantling an ACT-Based Intervention for Work Stress: Do Values Really Matter?

Barbara A. Hermann

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**DISMANTLING AN ACT-BASED INTERVENTION FOR WORK STRESS:
DO VALUES REALLY MATTER?**

By

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B.S., The Pennsylvania State University, 1996

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A THESIS

Submitted in Partial Fulfillment of the

Requirements for the Degree of

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(in Psychology)

The Graduate School

The University of Maine

December, 2008

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**DISMANTLING AN ACT-BASED INTERVENTION FOR WORK STRESS:
DO VALUES REALLY MATTER?**

By Barbara A. Hermann

Thesis Advisor: Dr. Sandra T. Sigmon

An Abstract of the Thesis Presented
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy
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Acceptance and Commitment Therapy (ACT), a multi-component intervention within the third-wave of behavioral therapy, has been shown to improve various outcomes in diverse populations and administration formats. This study utilized a dismantling design to investigate whether the values components of an ACT-based intervention for work stress add to the effects of the intervention beyond those of the mindfulness components and to explore possible mediators of change. Expanding beyond existing studies of ACT, a broad range of outcomes were examined pre-treatment, post-treatment, and at three follow-up assessments in a small sample ($N = 16$) of employees of a university in the Northeast. Various factors proposed to possibly mediate changes in outcomes for each version of the intervention, in addition to various therapy process measures, were examined.

Due to the small sample size, findings are preliminary. Results indicated that participants who received the complete intervention (ACT) experienced meaningful changes in a greater number of outcomes and process variables than did participants in

the abbreviated group that omitted the values components (AT). Both groups experienced improvements on measures of stress, mental health, quality of life, affect and cognition. However, participants in ACT experienced less functional interference in work and social activities from distress, experienced improvements in work locus of control, trait anxiety, mindfulness, and coping behavior. Although AT appeared to be more effective for reducing job stress, participants in ACT experienced greater improvement in life stressor impact. Findings generally supported greater improvement in follow-up outcome scores for participants in the AT group and maintenance of post-treatment gains for participants in the ACT group. Although neither group reported meaningful changes in psychological flexibility, both groups reported changes in frequency of and belief in negative automatic thoughts and only participants in ACT experienced improvement on a measure of mindfulness. Correlational analyses suggested that different process variables were associated with different outcomes in the two groups. The possible roles values clarification may play in encouraging goal setting, motivation, and follow-through and the relation of these roles to the differential findings between groups, along with possible mechanisms of action in each group are discussed.

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Chapter 1

INTRODUCTION

In recent years, the evolution of cognitive-behavioral therapy (CBT) interventions has included the development of mindfulness- or acceptance-based approaches (Hayes, 2004). These interventions, termed third-wave CBTs, have been developed and are built on a distinct theoretical perspective regarding the source and alleviation of distress. These interventions emphasize changing how individuals relate to their thoughts, feelings, and physical experiences rather than changing the content of those experiences, in order to alleviate unpleasant psychological and physical experiences (e.g., Hayes, Strosahl, & Wilson, 1999; Linehan, 1993; Segal, Williams, & Teasdale, 2002). The effectiveness of these third-wave CBT approaches has been documented for a wide variety of psychological and physical disorders (see Baer, 2003 and Hayes, Luoma, Bond, Masuda, & Lillis, 2006 for recent reviews). Several of these interventions have focused on the alleviation of stress related to psychological and physical disorders and their outcome evaluations have also indicated positive effects (e.g., Kabat-Zinn et al., 1992; Kaplan, Goldenberg, & Galvin-Nadeau, 1993).

Encouraged by such positive findings from research in clinical psychology and behavioral medicine, stress management interventions that employ psychological mindfulness techniques have recently entered into the empirical purview of occupational health psychology, and a number of interventions have shown promising outcomes (e.g., Bond & Bunce, 2000; Williams, Kolar, Reger, & Pearson, 2001). One such intervention is based on the psychotherapy version of Acceptance and Commitment Therapy (ACT,

said as one word, not as letters; Hayes et al., 1999). Theoretically grounded in the behavioral tradition and based on an empirical analysis of human cognition, ACT is unique among the third-wave mindfulness-based therapies. Proponents of ACT operationalize the construct and techniques of mindfulness in cognitive-behavioral terms and also address the role of personal values in behavior (Hayes, 2004).

Further research is needed to better understand the effects of such mindfulness-based approaches as ACT for stress management in occupational settings. Research is also needed to examine whether non-mindfulness strategies incorporated within multimodal mindfulness interventions (e.g., values components in ACT) add to the effects of mindfulness toward mental and physical well-being outcomes, as well as work-related outcomes and coping behaviors. Furthermore, the mechanisms that may drive the effects achieved in ACT-based interventions are just beginning to be researched and warrant further examination.

This review focuses on the theoretical and empirical status of ACT and its components, as well as other mindfulness-based approaches, and their relevance for stress management and general well-being. A recently developed ACT-based stress intervention, specifically developed for the workplace, is described and compared to other commonly utilized stress management programs. Based on this review of the literature, it is contended that the development of mindfulness reflects an effective strategy to reduce workplace strain and improve mental and physical well-being as well as other work-related outcomes.

To ascertain the effects of mindfulness training and of personal values clarification above and beyond that of mindfulness, an intervention study was undertaken. This study

evaluated a workplace stress management program based on an existing ACT-based protocol for the reduction of stress at the workplace. A dismantling design was used to compare the effects of the complete program to an abbreviated version that omits the values components. Mental and physical well-being, work-related outcomes, engagement in various coping behaviors, and factors hypothesized to relate to changes in measures of mental and physical well-being were assessed prior to and following the provision of the interventions, as well as at three follow-up assessments.

Philosophical and Theoretical Roots of Acceptance and Commitment Therapy

The Third Wave of Behavioral Therapy

The recent attention to mindfulness and its application within mental and physical health settings has been encouraged by the development of a new paradigm within the field of behavioral psychology termed the “third wave” or generation of behavior therapies (Hayes, 2004). According to Hayes (2004), the first generation of behavior therapies represented a rebellion against the prevailing clinical conceptions of analytic and humanistic traditions of psychology. The goal of the first wave was to counter the theoretical and scientific weaknesses of these non-empirical clinical perspectives. Behavior therapists argued against complex untested theorizing in interpretation of psychological symptoms and provided simpler explanations for behavior with the aim of practical utility (e.g., Ayllon, Haughton, & Hughes, 1965; Wolpe & Rachman, 1960). The first generation of behavior therapies, based on learning theories and a commitment to well-established experimental paradigms, was directly focused on problematic overt behavior and emotional reactions (Hayes, 2004).

This narrow focus, however, led to a neglect of internal and subjective events of the human experience that were not amenable to examination via simple associative concepts of stimulus-response learning. According to Hayes (2004), attempts by traditional Skinnerian behaviorists to empirically and adequately account for the development of language and cognition were deemed inadequate. In this context, behavioral theorists of the late 1960s and early 1970s searched for more novel and flexible learning principles in order to address thoughts and feelings. Early cognitive mediational accounts of behavior change (e.g., Bandura, 1969) evolved quickly into the cognitive therapy movement (e.g., Beck, Rush, Shaw, & Emery, 1979; Mahoney, 1974; Michenbaum, 1977).

This second wave of behavior therapy did carry forward with it many of the central themes of the first wave, such as adherence to measurement and functionality. Also included in the second-wave CBT interventions was the focus on content changes, or what has been called content-focused or “first-order” change (Hayes, 2004, p. 643). Although targeting cognitive processes, this focus mirrored behavioral change strategies from the first wave, such as increasing time spent in social situations for anxious clients who avoided such situations (Hayes, Strosahl, Bunting, Twohig, & Wilson, 2004). In the second wave, strategies were developed with the goals of weakening or eliminating thoughts deemed irrational, cognitive schemas seen as pathological, and information-processing styles categorized as faulty, via their detection, disputation, and correction (Beck, 1993). Such strategies implicitly assume that changing undesirable thoughts and feelings will result in improved quality of and success in life.

Within the past decade, a new third wave of behavior therapy has emerged, fueled in large part by the emergence of two notable issues (Hayes, 2004). First, the identification of various empirical anomalies concerning the role of cognitive variables has led to the reexamination of certain aspects of the second wave's emphasis on cognitions over behavior. One core assumption that has come under particular scrutiny and undermines the "first-order" change agenda of the first two waves of behavior therapy is that direct cognitive change is a necessary or primary method of clinical improvement in most cases (Hayes, 2004). Specifically, results from a series of component analysis studies of CBT for depression revealed no additive benefit to providing cognitive change strategies (Gortner, Gollan, Dobson, & Jacobson, 1998; Jacobson et al., 1996). In addition, researchers have found that the response to traditional cognitive therapy often occurs before the presumptively key features of the therapy have been fully implemented (Ilardi & Craighead, 1994, 1999). Furthermore, support for the hypothesized mediators of change in cognitive therapy is mixed (e.g., Burns & Spangler, 2001; Morganstern & Longabaugh, 2000).

The second factor influencing the development of the third wave of behavior therapies reflected the inadequacy of the prevalent philosophical perspectives underlying the second wave. According to Hayes and colleagues (2006), the cognitive-behavioral therapies that emerged during the second wave were based on dominant cognitive models that were largely either mechanistic information processing approaches or cognitive developmental approaches (Hayes et al., 2006). In addition, these perspectives were more focused on the nature and evolution of cognitions and their impact on other

experiences than they were on the specific contextual events that may regulate these psychological events and relate them to each other (Hayes, 2004).

The mechanistic stance has been utilized in second-wave interventions to argue that if a particular thought is associated with an undesirable effect (e.g., an aversive emotion), then the content of that thought should usually be directly targeted, the logical flaws in its content pointed out or tested, and alternative content instilled (Hayes, 2004). Hayes (2004) argues that this line of action presupposes that the form, frequency, or situational appropriateness of the thought itself is what leads directly to emotional and behavioral effects.

Hayes and Brownstein (1986) proposed that such a philosophical base has been deemed inadequate for empirical accounts or models of cognition because it tends to limit the direct applied relevance of the basic cognitive concepts that result from it. According to the authors, cognitive concepts generated by information processing and developmental cognitive perspectives, unlike those from behavioral analysis, do not allow for a manipulable context that could be targeted in order to affect a dependent variable. For example, a concept such as cognitive schema (Piaget, 1964), is focused on the organization of a specific kind of dependent variable (i.e., cognition) but it does not itself specify the contextual events that could alter this variable or regulate its impact on other forms of experience or activity. Thus, the concept of schema is inherently different from a behavioral analysis principle such as reinforcement, which focuses on the interface between action and its changeable context (Hayes et al., 2006).

Rather than specifying a contextual term as a target of intervention for the purpose of improved functioning and lessened distress, the second wave of behavior

therapies (i.e., CBT) has made cognitions and other internal events their targets of change, with mixed results and without a sound empirically-derived theoretical basis. In addition, Hayes and colleagues (1993) state that the rise of constructivism and similar postmodern theories of science have also contributed to the evolution of the third wave approaches by weakening the idea that scientific theories ought to identify discrete parts of reality that can then be organized into comprehensive models (Hayes, Hayes, Reese, & Sarbin, 1993). Such a philosophical shift has further eroded the assumptive base of both the first and second wave of behavioral and cognitive therapies and their underlying theories in favor of a more instrumentalist and contextual approach (Hayes, 2004).

Examples of contextual therapies that developed as part of the third wave of behavioral therapy include Acceptance and Commitment Therapy (ACT), along with several mindfulness-based CBTs and related meta-cognitive approaches which will be reviewed in the subsequent section. These third generation approaches have been defined as follows (Hayes, 2004):

Grounded in an empirical, principle-focused approach, the third wave of behavioral and cognitive therapy is particularly sensitive to the context and functions of psychological phenomena, not just their form, and thus tends to emphasize contextual and experiential change strategies in addition to more direct and didactic ones. These treatments tend to seek the construction of broad, flexible and effective repertoires over an eliminative approach to narrowly defined problems, and to emphasize the relevance of the issues they examine for clinicians as well as clients (p. 658).

ACT is unique among the third wave approaches in that, beyond embracing a contextualistic philosophy of science, it is based on a basic, empirically-derived theory of language and cognition and an applied theory of psychopathology and psychotherapy (Hayes et al., 2006).

ACT Philosophy: Functional Contextualism

ACT is rooted in the pragmatic philosophy of functional contextualism (Biglan & Hayes, 1996; Hayes, 1993; Hayes & Brownstein, 1986; Hayes, Hayes, & Reese, 1988); a specific variety of contextualism that has as its goal the prediction and influence of events, with precision, scope and depth (Hayes, 1993). The core analytic unit of functional contextualism is the “ongoing act in context” (Hayes, 2004, p. 646). This perspective views psychological events as continuous actions of the whole organism interacting in and with historically and situationally defined contexts and forms the basis of the behavior analysis tradition from which ACT evolved (Hayes, 2004). The main components of functional contextualism are “(a) a focus on the whole event, (b) sensitivity to the role of context in understanding the nature and function of an event, (c) emphasis on a pragmatic truth criterion, and (d) specific scientific goals against which to apply that truth criterion” (Hayes, 2004, p. 646).

Workability represents the truth criterion emphasized in all forms of contextualism (Hayes et al., 1988), in other words, what is considered “true” is what works or is functional. In order to know what is functional, however, one needs to know what is being worked toward so that such a goal is able to allow a pragmatic truth criterion to be applied (Hayes, 1993). Therefore, in ACT, personal goals and values are integral to the assessment of workability (Hayes et al., 2006). Also in ACT, causal

analyses are limited to events that are directly manipulable, and thus it has a consciously contextualistic focus. From such a perspective, thoughts and feelings do not cause other actions, except as regulated by context (Biglan & Hayes, 1996; Hayes & Brownstein, 1986). Therefore, it is possible to go beyond attempting to change thoughts or feelings so as to change overt behavior, to changing the context that causally links these psychological domains (Hayes et al., 2006). According to Hayes (2004), the removal of a client's problematic behaviors from the contexts involved (e.g., merely analyzing symptoms themselves) is seen as missing the nature of the problem and options to solve it (Hayes, 2004). Instead, accomplishing the goal of influencing behavior is said to require manipulation of events, and only contextual variables can be manipulated directly (Hayes & Brownstein, 1986).

There are several key implications of functional contextualism as a philosophy of science that highlight the contrast to the mechanistic approach and are also echoed within ACT. Hayes (2004) outlined them as follows. First, because functional contextualism rejects ontology on epistemological grounds, ACT does not attempt to find out what is objectively true or real because the world is known only through our interactions in and with it and such interactions are always constrained by history and context. Workability of the changes made via the application of ACT is instead the truth criterion. In a parallel way, ACT clients are encouraged to abandon any interest in the literal truth of their own thoughts or judgments and instead encouraged to embrace a focus on living according to their life goals or values. Second, the holistic and context-focus of functional contextualism emphasizes that no event affects another in a simple mechanical way. ACT embodies this assumption by proposing that a client adopt an open and accepting

stance toward all psychological events, even if those events have been labeled “negative” or “irrational”. It is not their presence that is the issue to be dealt with but their contextually established function and meaning. Lastly, the foundational nature of goals in functional contextualism is reflected in ACT’s emphasis on chosen personal values as a necessary part of a meaningful life and an effective course of treatment.

Theoretical Framework of ACT: Relational Frame Theory

ACT is built on Relational Frame Theory, a functional contextual theory of human language and cognition developed from a comprehensive experimental research program (RFT; Hayes, Barnes-Holmes, & Roche, 2001). RFT has become one of the most actively researched basic behavior analytic theories of human behavior, with over 70 empirical studies focused on its tenets (reviewed in Hayes et al., 2001).

According to RFT, the core of human language and cognition is the learned and contextually controlled ability to arbitrarily relate events mutually and in combination, and to change the functions of specific events based on their relations to others (Hayes et al., 2006). Hayes (2004) provides the following example to illustrate this proposition: Very young children will know that a nickel is larger than a dime by physical size, but not until later will the child understand that a nickel is smaller than a dime by social attribution. In addition to being arbitrarily applicable (a nickel is “smaller” than a dime merely by social convention), this more psychologically complex relation is mutual (e.g., if a nickel is smaller than a dime, a dime is bigger than a nickel), combinatorial (e.g., if a penny is smaller than a nickel and a nickel is smaller than a dime then a penny is smaller than a dime), and alters the function of related events (e.g., if a nickel has been used to buy candy, a dime will now be preferred even if it has never actually been used before).

Hayes (2004) and colleagues (Hayes et al., 2006) note three critical features of RFT that lead to the applied implications of the theory. The first feature is that human cognition represents a specific kind of learned behavior. For example, RFT researchers have recently shown that arbitrarily applicable comparative relations (e.g., the nickel and dime situation just mentioned) can be trained as an overarching operant in young children (Barnes-Holmes, Barnes-Holmes, Smeets, Strand, & Friman, 2004). The second feature is that such relations show “combinatorial entailment” (Hayes, 2004, p. 648):

If a person learns in a particular context that A relates in a particular way to B, and B relates in a particular way to C, then this must entail some kind of mutual relation between A and C in that context. For example, if by attribution a nickel is smaller than a dime and a dime is smaller than a quarter, then it will be derived that a quarter is bigger than a nickel and a nickel is smaller than a quarter (p. 648).

The last critical characteristic of RFT is that such relations make it possible to change the stimulus functions among related stimuli. For example, if an individual wants to purchase some candy and a dime is known to be valuable, it will be derived that a nickel will be less valuable and a quarter will be more valuable towards that goal, without necessarily directly purchasing candy with nickels and quarters. A “relational frame” is said to refer to the occasion when all the three features just noted are established within a given type of relational responding (Hayes, 2004).

According to Hayes (2004), what makes relational framing clinically relevant is that functions given to one member of related events tends to alter the functions of other members. Hayes (2004, p. 648-649) illustrates this concept in the following way: Take a

child who has never seen a cat. After learning that “C-A-T” → (i.e., refers to) an animal, and that “C-A-T” also → “cat”, the child can derive four additional relations: (1) animal → C-A-T, (2) “cat” → C-A-T, (3) “cat” → animal, and (4) animal → “cat”. Now suppose that the child is scratched by a cat while playing, cries in distress, and runs away. If later the child hears someone say “Oh, look, a cat!”, the child may cry and run away again, even though the child was never scratched in the presence of someone saying the words “Oh, look, a cat!” Such effects may help explain why, for example, individuals who experience being trapped in a vehicle during an accident may later have an initial panic attack while “trapped” in a shopping mall, and soon find that they are worrying about being “trapped” in an open field or on a bridge. According to Hayes (2004), what brings these situations together is not their formal properties in a simple sense, but the verbal/cognitive activities that relate these events together for an individual.

In RFT, human language and cognition are both dependent on relational frames (Hayes, 2004). When we think, reason, speak with meaning, or listen with understanding, we do so by deriving relations among events – among words and events, words and words, and events and events. According to Hayes (2004), unlike Skinner’s verbal operants, what makes relational operants unique is that they alter how direct learning processes themselves work. This means that the changes of stimulus functions alters how stimulus control operates since now events can acquire functions through indirect, relational (i.e., cognitive) means. Thus, Hayes (2004) notes that in RFT, unlike Skinner’s account, it is not simply possible to but actually necessary to examine cognition in order to understand human behavior, and such a task requires a contextual rather than a mechanistic approach.

The primary implications of RFT in the area of psychopathology and psychotherapy extend from the important features just described (Hayes, 2004; Hayes et al., 2001): (1) verbal problem solving and reasoning is based on some of the same cognitive processes that can lead to psychopathology, and thus it is not practically viable to eliminate these processes, (2) much as extinction inhibits but does not eliminate learned responding, the common sense idea that cognitive networks can be logically restricted or eliminated is generally not psychologically sound because these networks are the reflection of historical learning processes; (3) direct change attempts focused on key nodes in cognitive networks creates a context that tends to elaborate the network in that area and increase the functional importance of these nodes, and (4) given that the content and the impact of cognitive networks are controlled by distinct contextual features, it is possible to reduce the impact of negative cognitions whether or not they continue to occur in a particular form. According to Hayes and colleagues (2006), taken together, these four implications mean that it is often neither wise nor necessary to focus primarily on the content of cognitive networks in clinical intervention, and as an alternative they suggest that it is quite possible instead to focus on their functions.

The ACT Model of Psychopathology and Psychotherapy

Factors Underlying Psychopathology

In ACT, virtually every component of the protocol is connected conceptually to RFT (Hayes et al., 2006). From an ACT/RFT point of view, although psychological problems can emerge from the general absence of relational abilities (e.g., in the case of mental retardation), a primary source of psychopathology (as well as a process exacerbating the impact of other sources of psychopathology) is the way that language

and cognition interact with direct contingencies to produce an inability to persist or change behavior in the service of long-term valued ends (Hayes et al., 2006). According to Hayes (2004), this kind of psychological inflexibility or rigidity is argued to emerge from two main processes, cognitive fusion and experiential avoidance, both of which are direct consequences of human language and cognition itself, although amplified by culture and learning experiences (Hayes, 2004).

Cognitive fusion refers to excessive or improper regulation of behavior by verbal processes, such as rules and derived relational networks (see Hayes, Strosahl et al., 1999 for further details). Relational networks are extremely difficult to break up, even with direct, contradictory training (Wilson & Hayes, 1996). This difficulty is due in part to numerous derived relations that are available to maintain and reestablish a given relational network. In addition, the actual experience of learning and deriving relational networks that make sense or allow an individual to solve a problem in essence provide automatic reinforcement for the act of deriving such relations (Hayes, 2004). According to Hayes (2004), the result of this difficulty (i.e., in altering established language and cognition processes and the reinforcing nature of these processes) is that stimulus functions from relational frames typically dominate over other factors capable of regulating behavior and do so with little or no awareness of these processes.

Hayes (1989) also contends that in contexts that foster cognitive fusion, human behavior is guided more by relatively inflexible verbal networks of rules and evaluations than by contact with here-and-now experiences and the direct environmental contingencies therein (Hayes, 1989). Thus, an individual is unaware of the relational processes themselves. For example, the fearful client who constructs a fearful

environment will act as if that fearsomeness has been somehow discovered and is outside of the individual, rather than as being assembled cognitively (Hayes, 2004). As a result, individuals may act in a way that is inconsistent with their chosen life values and goals. Because behavior governed by relational networks is extremely insensitive to contradictory experiences (e.g., Hayes, Brownstein, Zettle, Rosenfarb, & Korn, 1986), verbal formulations can continue to create distress even when little environmental support exists for them (Hayes, 2004). From an ACT/RFT point of view, the form or content of cognition is not directly troublesome, unless contextual features lead this cognitive content to regulate human action in unworkable or dysfunctional ways (Hayes et al., 2006).

According to Hayes and colleagues (2006), the functional contexts that tend to have such deleterious effects are largely sustained by the social/verbal community and come in several forms. For example, a context of literality treats symbols (e.g., the thought, “life is hopeless”) as one would referents or literal truths (i.e., a truly hopeless life). A context of reason-giving bases action or inaction excessively on the constructed “causes” of an individual’s own behavior, especially when these processes point to non-manipulable “causes” such as conditioned ways of thinking or patterns of emotional reactions (Addis & Jacobson, 1996; Zettle & Hayes, 1986). Individuals then assume that to change how they act or do not act, they must change the cause, the painful thought or feeling. A context of experiential control focuses on the manipulation of emotional and cognitive states as a primary goal and metric of successful living.

These contexts are interrelated, which helps explain why cognitive fusion supports the second main process purported to underlie psychopathology according to

ACT, experiential avoidance – the attempt to alter the form, frequency, or situational sensitivity of private events even when doing so causes behavioral harm (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). An individual does not have the option of trying to avoid psychological pain or distress, as they could a situation that had caused physical pain in the past. According to Hayes (2004), relational frames allow such distress to occur in almost any situation via a transformation of stimulus functions and their arbitrary contextual control does not allow the use of simple avoidance of the situation as an effective solution. Due to the temporal and comparative relations present in human language, so-called “negative” emotions are verbally identified, evaluated, and avoided (Hayes et al., 2006). Experiential avoidance is based on this natural language process—a capacity to relate events via language and engage in verbal rules that is not inherently problematic. The process does become maladaptive, however, when amplified by the culture into a general focus on “feeling good” and avoiding pain. Unable to control pain by situational means, humans may try to avoid the painful thoughts and feelings themselves with excessive verbal regulation that becomes inflexible to feedback from its dysfunctional consequences.

Unfortunately, many attempts to avoid uncomfortable private events (e.g., suppression) tend to increase their occurrence and behavioral impact (Cioffi & Holloway, 1993; Clark, Ball, & Pape, 1991; Wegner, Schneider, Carter, & White, 1987). This result occurs because such control efforts may ultimately themselves come to cue the avoided event or strengthen the underlying relational frames. In other words, attempts at not thinking of being anxious or avoiding situations similar to the situation which brought on the experience of being anxious will serve as a contextual cue for anxiety and the

thoughts and feelings associated with the actual event that this anxiety is related to (Hayes, 2004; Hayes et al., 2006). Short-term feelings of control over painful private events, coupled with social pressure to “feel good” and be free of difficult psychological pain may, however, reinforce and encourage use of such avoidance strategies. Reliance on avoidance strategies further narrows the range of behaviors that an individual is willing to engage in given that many behaviors might evoke these feared private events (Hayes et al., 2004).

According to Hayes and colleagues (2006), cognitive fusion and experiential avoidance fuel each other and hamper engagement in alternative coping efforts as they strengthen. Contact with the present moment decreases as individuals begin to live “in their heads” and become more and more “fused” with their cognitions. The past and future, and even the self, are seen in conceptualized terms and gain more regulatory power over behavior, further contributing to psychological inflexibility (Hayes et al., 2006). For example, it can become more important to be right about who is responsible for personal pain, than it is to live more effectively with the history one has. Similarly, it can become more important to defend a verbal view of oneself (e.g., being a victim, never being angry, being broken, etc.) than to engage in more workable forms of behavior that do not fit that verbalization.

According to this model, in the world of overt behavior, long-term desired qualities of life (i.e., values) take a backseat to more immediate and self-soothing goals of being right, looking good, feeling good, and defending a conceptualized self. Patterns of action emerge from habitual engagement and gradually dominate an individual’s repertoire of behaviors, even as they prolong or exacerbate psychological distress and

move the individual further and further away from long-term desired qualities of living (Hayes et al., 2006).

Core Therapeutic Strategies of ACT

The general clinical goals of ACT are to undermine fusion with the literal verbal content of cognition that encourages behaviors aimed at avoidance and to construct an alternative context in which behavior is in line with one's values and is more likely to occur (Hayes, 2004; Hayes et al., 1999). To counteract psychological rigidity and to promote psychological flexibility, the ACT intervention model is defined by: mindfulness processes, aimed at encouraging present-focused acceptance of and defusion from cognitive content, and values processes, aimed at identifying personal values to direct behavioral choices and developing commitment to those choices. In other words, the goals of ACT are to enhance the ability to contact the present moment more fully and to change or persist in behavior when doing so serves valued ends (Hayes et al., 2006; Strosahl, Hayes, Wilson, & Gifford, 2004). According to this model, psychological flexibility is established through the following six core ACT processes: Acceptance, cognitive defusion, being present, self as context, values, and committed action. Each of these areas is conceptualized as a positive psychological skill, not merely as a method of avoiding psychopathology (Hayes et al., 2006), and is described below in the order presented in the original ACT protocol (Hayes et al., 1999).

Taught as an alternative to experiential avoidance, acceptance refers to the willingness to experience all psychological events (i.e. thoughts, feelings, and sensations), including those which are negatively evaluated (e.g. anxiety) without changing, avoiding, or otherwise controlling them (Hayes, 1987; Hayes et al., 1996). By

accepting these internal events, individuals can more effectively use their energies, formerly given over to resignation, avoidance, or control of these events in order to act in a way that is congruent with their values and goals. ACT promotes acceptance by training individuals to be aware of their thoughts and feelings. For example, clients with anxiety disorders are taught to feel anxiety, as a feeling, fully and without defense, whereas clients with chronic pain are given methods that encourage them to let go of a struggle with pain (Eifert & Forsyth, 2005; Hayes et al., 2006). Acceptance is also fostered as a method of increasing values-based action. Thus, ACT clients are encouraged to feel good (i.e., do a good job of feeling fully what there is to be felt), as opposed to feeling good (i.e., changing one's goal-directed actions in order to experience feelings that are evaluated as "good;" Hayes et al., 1996).

Cognitive defusion techniques attempt to alter the undesirable functions of thoughts and other private events, rather than trying to alter their form, frequency or situational sensitivity (Hayes et al., 2006). The goal of cognitive defusion is to change the way one interacts with or relates to thoughts by creating contexts in which their unhelpful functions are diminished. There are numerous techniques of defusion that have been developed for a wide variety of clinical presentations (Hayes & Strosahl, 2004). For example, a negative thought could be observed dispassionately, repeated out loud until only its sound remains and its meaning lost, or treated as an external event to be observed by giving it a shape, size, color, speed, or form. An individual could thank his or her mind for such an interesting thought, label the process of thinking ("I am having the thought that I am no good"), or examine the historical thoughts, feelings, and memories that occur while he or she experiences that thought. Such procedures attempt to reduce

the literal quality of the thought, weakening the tendency to treat the thought as what it refers to (“I am no good”) rather than what it is directly experienced to be (e.g., the thought “I am no good”). The result of defusion is usually a decrease in believability of, or attachment to, private events rather than an immediate change in their frequency (Hayes et al., 2006).

In techniques aimed at encouraging clients to be present, ACT promotes ongoing non-judgmental contact with psychological and environmental events as they occur. The goal is to have clients experience the world more directly so that their behavior is more flexible and thus their actions are more consistent with the values that they hold (Hayes et al., 2006). Direct experiential contact then allows evaluation of the consequences of actions (or nonactions based on experiential avoidance) in terms of their workability with respect to valued ends. In addition, language is used not to evaluate but as a tool to note and describe events in order to bring such events and their consequences into awareness. A sense of self called “self as process” is actively encouraged via the defused, non-judgmental ongoing description of thoughts, feelings, and other private events (Hayes et al., 2006).

Related to this “self as process” and as a result of relational frames such as “I versus You”, “Now versus Then”, and “Here versus There”, human language leads to a sense of self as a locus or perspective, and provides a transcendent, spiritual side to normal verbal humans (Hayes et al., 2006). In this vein, if “self as process” reflects the act of observing experience, then “self as context” reflects the observer that does the observing. This concept represents one of the core seeds from which both ACT and RFT grew (Hayes, 1984); and there is now growing evidence of its importance to language

functions such as empathy, theory of mind, and sense of self (e.g., see McHugh, Barnes-Holmes, & Barnes-Holmes, 2004). In brief, the idea is that “I” emerges over large sets of exemplars of perspective-taking relations (i.e., what are termed in RFT “deictic relations”). However, since this sense of self is a context for verbal knowing, not the content of that knowing, its limits cannot be consciously known. According to Hayes and colleagues (2006), self as context is important in part because from this standpoint one can be aware of one’s own flow of experiences without attachment to them or an investment in which particular experiences occur; thus defusion and acceptance is fostered. Self as context is developed in ACT by mindfulness exercises, the use of metaphors, and experiential processes.

Values in ACT represent chosen qualities of purposive action that can never be obtained as an object but can be instantiated moment by moment. ACT uses a variety of exercises to help a client choose life directions in various domains (e.g., family, career, spirituality) while undermining verbal processes that might lead to choices based on avoidance, social compliance, or fusion (e.g., “I should value X” or “A good person would value Y” or “My mother wants me to value Z”, Hayes et al., 1999). In ACT, acceptance, defusion, and being present are not ends in themselves but rather reflect methods to clear the path for a more vital, values consistent life (Hayes et al., 2006; Strosahl, Hayes, Wilson, & Gifford, 2004).

Finally, ACT encourages the development of larger and larger patterns of effective action linked to chosen values, or committed action. In this regard, ACT looks very much like traditional behavior therapy, and almost any behaviorally coherent behavior change method can be fitted into an ACT protocol, including exposure, skills

acquisition, shaping methods, and goal setting (Hayes et al., 2006; Strosahl et al., 2004). Unlike values, which are constantly enacted but never achieved as an object, concrete goals that are values-consistent can be achieved. ACT protocols almost always involve therapy work and homework linked to short, medium, and long-term behavior change goals (e.g., Eifert & Forsyth, 2005; Hayes et al., 1999). Significantly, behavior change efforts in turn may lead to contact with psychological barriers that are then addressed through the previous listed ACT processes. The core ACT components are both overlapping and interrelated and taken as a whole, each supports the other and all target psychological flexibility (Hayes et al., 2006).

Empirical Status of ACT and Its Components

Evaluations of ACT as an Intervention

ACT has been delivered in both individual and group psychotherapy formats. Because the conceptualization behind it is based on natural processes of human language and cognition (Hayes et al., 1996; Hayes et al., 2001), if the theory is correct, ACT should have broad applicability. Support for this contention has been found within research evaluations of ACT applied to a wide variety of psychological and physical disorders. Interestingly, the length of the ACT protocol utilized has varied greatly between extant published studies, from 48 sessions over 16 weeks to four sessions over three weeks (Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004).

Examination of the literature indicates that ACT has been compared to a structured intervention and a control group in 11 randomized controlled trials (RCTs) and to wait-list, placebo, or treatment as usual conditions in six RCTs. Four of these studies were not available to the present author for review given that they were dissertations

(Block, 2002, as cited in Hayes et al., 2006; Gregg, 2004, as cited in Hayes et al., 2006; Lundgren, 2004, as cited in Hayes et al., 2006), a manuscript in press (Gratz & Gunderson, in press, as cited in Hayes et al., 2006), or a paper presented at a conference (Branstetter, Wilson, Hildebrandt, & Mutch, 2004, as cited in Hayes et al., 2006). Data from these sources will be presented based on information provided within the recent review by Hayes and colleagues (Hayes et al., 2006). Two RCTs specifically focusing on stress at the workplace (i.e., Bond & Bunce, 2000; Dahl, Wilson, & Nilsson, 2004) will be discussed in a later section. Beyond focusing on changes in outcomes, several of these studies have also either conducted formal mediational analyses, using the prominent procedures introduced by Judd and Kenny (1981), or have reported processes of change data using less stringent criteria, or have had their data reanalyzed for the purpose of mediational analysis.

The present review will begin with a discussion of the handful of studies that have directly compared ACT and traditional CT or CBT (Block, 2002, as cited in Hayes et al., 2006; Branstetter et al., 2004, as cited in Hayes et al., 2006; Zettle & Hayes, 1986; Zettle & Rains, 1989). One of the first intervention studies to test the ACT model compared an early version of ACT called comprehensive distancing (CD) to two variants of cognitive therapy (CT) for depressed clients delivered in a 12 week individual protocol (Zettle & Hayes, 1986). Given that the two variants were virtually identical in outcomes, the two groups were combined for the main comparison. Results indicated that CD was superior to CT on depression outcomes at post-treatment and at a 2-month follow-up. No significant differences were found between the CD and CT group on the reported frequency of automatic depressogenic thoughts. However, clients were also asked to rate

the believability of these same thoughts when they occurred (i.e., a measure of cognitive fusion). Results indicated that the CD group had lower cognitive fusion scores than those of the CT group at post-treatment and at follow-up. The groups also differed on a measure of reason-giving. Specifically, individuals in the CD group reported reduced validity ratings for reasons given by hypothetical others for their dysfunctional actions from pre-treatment to post-treatment, whereas individuals in the CT group reported increased ratings. With regard to validity ratings of their own reasons for engaging in hypothetical dysfunctional actions, the CD group evidenced a large reduction in validity ratings from post-treatment to follow-up, with a significant proportion reporting decreased ratings from pre-treatment through follow-up. In contrast, CD participants reported only a slight reduction in ratings from pre-treatment to follow-up and a more noticeable increase from pre- to post-treatment.

A formal mediational analysis was not reported in the original study, however, Hayes and colleagues (2006) reanalyzed the data. At the mid-point of treatment (week 6), individuals in the CD and CT groups did not differ significantly in their depression scores, but they did differ significantly in their cognitive fusion scores. Hayes and the other reviewers (2006) found that mid-point cognitive defusion scores did indeed mediate the decrease in depression scores at post-intervention and at follow-up. Thus greater changes in the believability of depressogenic thoughts mediated the superior outcomes achieved by ACT versus CT in this study.

Subsequent to the study conducted by Zettle and Hayes (1986), Zettle and Rains (1989) further examined the early version of ACT (i.e., CD) versus CT for depression. A sample of 31 women with moderate to severe depression were randomized to one of three

different group therapies: (a) complete cognitive therapy (CCT), involving procedures aimed at cognitive distancing, cognitive restructuring, and behavioral hypothesis-testing; (b) partial cognitive therapy (PCT), which omitted distancing procedures; or (c) comprehensive distancing (CD). All three groups showed significant, but equivalent, reductions in depression from pretreatment through follow-up. Although a comparison of adjusted means revealed a lower score for CD than for either CCT or PCT, individuals in the CCT and PCT groups reported significant reductions in dysfunctional attitudes compared to individuals in the for CD group. The authors concluded that these findings indicate different underlying therapeutic processes between the ACT-based and the cognitive therapy-based treatments.

Researchers in a separate lab (Block, 2002, as cited in Hayes et al., 2006) conducted a small randomized trial comparing ACT, cognitive-behavioral group therapy (CBGT), and a wait-list control group in the treatment of social phobia. Results indicated that both treatment groups were superior to the control condition on most outcome measures. Furthermore, participants in the ACT group participated longer in an arranged public speaking situation and reported larger reductions in distress during the speech than those in the other groups at post-treatment. The primary process variable, willingness to experience anxiety during exposure, also increased more pre to post-treatment for ACT than for CBGT and declined in the wait-list condition. However, the differences among groups at baseline approached significance; ACT participants were generally more severely phobic. Therefore, regression to the mean may represent a possible explanation for these results. Examining only the post-treatment scores on the primary outcome variable (i.e., length of time in a public speaking situation), however, the effect sizes for

the differences in the outcome between ACT and either CBGT or the control group were large, which is particularly supportive given the trends at baseline.

More recently, ACT was compared with a traditional CBT intervention focusing on relaxation and cognitive restructuring. In this study, the distress of individuals with end-stage cancer was targeted (Branstetter et al., 2004, as cited in Hayes et al., 2006). Twelve sessions of each treatment were delivered to randomly assigned cancer patients during chemotherapy appointments or other medical visits. By session 12, ACT produced significantly greater reductions in distress, anxiety, and depression in the patients compared to individuals in the traditional CBT group. Conducting a mediation analysis, the researchers found that reductions in the Mental Disengagement subscale of the COPE (Carver, Scheier, & Weintraub, 1989; e.g., ‘‘I go to movies or watch TV, to think about it less,’’) mediated the reduction in distress. Only the ACT condition resulted in reductions in mental disengagement, whereas the CBT condition actually resulted in increases this coping strategy (Hayes et al., 2006).

Between condition effects sizes (using Cohen’s *d*) across these four studies comparing ACT with CT or CBT were medium to large at post-treatment and large at follow-up in favor of ACT (Hayes et al., 2006). On primary process of change measures specified from the ACT model (i.e., psychological acceptance), the between condition effect sizes in these studies were large at post-treatment and at follow-up. Thus, these early data tentatively suggest that ACT and traditional CBT may impact change processes differently and that ACT may have superior outcomes under certain circumstances (Hayes et al., 2006).

Apart from such comparisons between ACT and comprehensive CT or CBT protocols, other studies have examined ACT compared to or in conjunction with intervention strategies falling within the behavior therapy tradition. For example, Zettle (2003) contrasted ACT and systematic desensitization for math anxiety and found equivalent reductions. However, greater change in trait anxiety was found with systematic desensitization. In a more recent randomized study, ACT plus another behavioral strategy, habit reversal, was compared to a wait-list control for the treatment of trichotillomania (Woods, Wetterneck, & Flessner, 2006). Results indicated that self-reported and objectively verified hair pulling decreased significantly with the active treatment, was maintained at a 3-month follow-up, and correlated with changes in experiential avoidance to a large extent.

ACT has also been contrasted with various other intervention strategies in the area of substance abuse treatment. One study compared ACT to Nicotine Replacement Therapy (NRT) for smoking cessation (Gifford et al., 2004). Although no differences were found in quit rates between conditions at post-treatment, the ACT condition had better outcomes at 6-month follow-up (23% quit rate for ACT versus 11% quit rate for NRT) and significantly better outcomes at 1-year follow-up (35% quit rate for ACT versus 15% quit rate for NRT). Mediation analyses indicated that scores on a measure assessing smokers' endorsement of the need to avoid smoking-related thoughts and feelings in order to maintain abstinence accounted for the effects of ACT on abstinence outcomes.

Addressing more severe substance issues, Hayes and colleagues (2004) examined the treatment of polysubstance abusing individuals being maintained on methadone

(Hayes, Wilson, et al., 2004). Participants were randomly assigned to either ACT, Intensive Twelve-Step Facilitation, or to a methadone maintenance only control condition. Participants in the two active treatments received 32 individual and 16 group sessions. At the 6-month follow-up, participants in the ACT condition demonstrated a greater decrease in objectively measured (i.e., through monitored urinalysis) total drug use than did methadone maintenance alone; and greater decreases in self-reported total drug use than both of the other conditions. ITSF includes a significant acceptance component and there were few process differences between ACT and ITSF. However, there were a number of process differences between ACT and the control condition, including extent of believability in automatic thoughts and reason-giving for using drugs.

Focusing on therapists working with substance abusing individuals and addressing more interpersonal outcomes, a recent study compared ACT, multicultural sensitivity training (MT), and education about the biology of addiction, each administered via a 6-hour workshop (Hayes, Bissett, et al., 2004). At follow-up, ACT, but not MT, was superior to the education condition regarding frequency of stigmatizing attitudes toward clients; ACT was also significantly better than MT in reducing burnout. Mediation analyses found that a measure of cognitive defusion from stigmatizing thoughts toward substance abusing clients mediated both counselor burnout and stigmatizing attitudes in the ACT group but not the MT group.

Speaking to its effectiveness with particularly difficult to treat conditions, ACT has also been used to treat individuals with personality disorders and to those struggling with psychosis. In a small randomized trial on self-harm and emotional dysregulation among individuals diagnosed with Borderline Personality Disorder, Gratz and Gunderson

(in press, as cited in Hayes et al., 2006) compared TAU to a condition consisting of ACT and Dialectical Behavior Therapy (DBT). Hayes and colleagues (2006) note that about two-thirds of the sessions appeared to have been drawn from ACT. The ACT/DBT intervention resulted in large between group effects at post-treatment in reduction of self-harm and emotional dysregulation. Furthermore, a very large effect size was found for experiential avoidance but correlations between process and outcome were not reported by the study authors (Hayes et al., 2006).

Focusing on helping inpatients cope with positive psychotic symptoms, Bach and Hayes (2002) compared four 45-min sessions of ACT to treatment as usual (TAU) in a randomized trial. Although, overall symptom reduction was less in the ACT group compared with the TAU group, patients in the ACT condition exhibited half the rate of rehospitalization over a 4-month follow-up period compared with the TAU condition. Moreover, ACT resulted in lower believability ratings of psychotic symptoms (e.g., rating whether the delusions/hallucinations were literally true) at the 4-month follow-up. According to the authors, this pattern may be interpreted as an indication that ACT undermined denial and thus symptom admission was an indication of greater acceptance in the ACT group.

In a replication study, Gaudiano and Herbert (2006a, 2006b) focused on coping with hallucinations or delusions among inpatients hospitalized with a primary psychotic disorder or mood disorder with psychotic features. At discharge from the hospital, participants in a three-session ACT plus TAU condition showed significantly greater improvement in affective symptoms, overall improvement, social impairment, and distress associated with hallucinations than a TAU only condition. In addition, the 4-

month rehospitalization rates were 38% lower in the ACT group. Believability of hallucinations was found to mediate the relationship between frequency of hallucinations and associated distress at post-intervention in the ACT condition.

Beyond mental health applications, a series of ACT intervention studies have provided support for its effectiveness within behavioral medicine. In a study comparing ACT to an attention-placebo control condition, researchers found that in a sample of poor, institutionalized South Africans with epilepsy, ACT produced reductions of more than 95% in the average time spent per month seizing at post-treatment and at a 6-month and 1-year follow-up (Lundgren, 2004, as cited in Hayes et al., 2006). Although improvement in overall quality of life was not found at post treatment, increases were found at 6-month follow-up, and showed large and significant changes by the 1-year follow-up. Hayes and colleagues (2006) further indicated that ACT produced very large improvements at post-treatment and both follow-ups on a measure of experiential avoidance specific to epilepsy. Scores on this measure fully mediated 1-year follow-up outcomes for both frequency of seizures and quality of life. The quality of life result is seen as particularly important given that post-treatment changes in experiential avoidance occurred several months before significant quality of life changes were observed (Hayes et al., 2006).

In a separate recent study, the efficacy of ACT plus diabetes education was compared to that of only diabetes education in a trial that randomized newly diagnosed diabetics to a one-day workshop of one approach (Gregg, 2004, as cited in Hayes et al., 2006). As Hayes and colleagues (2006) indicate, at 3-month follow-up, ACT outperformed the control condition on changes in self-management behaviors and blood

glucose, particularly among those participants with a high blood glucose value. A measure of experiential avoidance specific to diabetes-related content was found to mediate the improvement in self-management behaviors but not the changes in blood glucose scores (Hayes et al., 2006).

Hayes and colleagues (2006) reviewed the between-condition effect sizes for these RCTs of ACT and comparison conditions. Summarizing across the existing literature, the review indicated that ACT has produced between condition effect sizes (using Cohen's *d*) of .66 at post ($N = 704$) and .66 at follow-up ($N = 519$). Average effect sizes for comparisons between ACT and active, well-specified treatments that were deliberately provided to affect the targeted problem were .48 at post-treatment ($N = 456$) and .63 at follow-up ($N = 404$). For comparisons with a wait-list condition, treatment as usual, or placebo treatments, the effect sizes were .99 at post-treatment ($N = 248$) and .71 at follow-up ($N = 176$). Thus, preliminary evidence supports the use of ACT across a number of different populations, across multiple outcomes, and with diverse methods of delivery.

Research on ACT Concepts and Components

The ACT process that has garnered the most attention and research is experiential avoidance. Evidence for the ACT model of psychopathology has come largely from correlational studies examining the relationship between measures of various psychological outcomes and the Acceptance and Action Questionnaire (AAQ; Hayes, Strosahl, Wilson, et al., 2004). The AAQ was developed by the originators of ACT and purports to assess level of experiential avoidance. The AAQ was constructed by having ACT therapists generate a pool of statements exemplifying the types of clinical processes

targeted by ACT. The resultant self-report instrument ostensibly measures the degree to which an individual fuses with their thoughts, avoids unpleasant feelings, and is unable to act in the presence of difficult private events (Hayes, Strosahl, Wilson, et al., 2004). Interestingly, Hayes and colleagues (2006) note that although the AAQ is usually referred to and utilized in research as a measure of experiential avoidance, they contend that it is actually a more general measure of several ACT processes that all bear on psychological flexibility (Hayes et al., 2006). Still others have conceptualized it as a measure of psychological acceptance (e.g., Bond & Bunce, 2000).

Although the nature of the construct that is tapped by the AAQ is arguably ambiguous, numerous investigations have utilized the measure in a variety of applications. In order to determine the extent to which the AAQ and various psychological outcomes are related, Hayes and colleagues (2006) recently performed several meta-analyses on data from 32 studies that investigated the relationship between the AAQ and various constructs. Results indicated that in general and to a moderate extent, higher levels of psychological flexibility (as assessed by the AAQ) are associated with better quality of life and outcomes, including lower probabilities of having a psychiatric disorder, less depression, and less anxiety (Hayes et al., 2006). In other studies, high levels of psychological flexibility has been found to predict less computer errors by stressed workers at a call center (Bond & Bunce, 2003), as well as to correlate, to a greater degree than actual pain ratings, with less disability, better work status, more daily “up” time, less use of analgesics, and fewer health-care related visits in patients with chronic pain (McCracken, 1998; McCracken, Vowles, & Eccleston, 2004).

Recently, researchers (Kashdan, Barrios, Forsyth, & Steger, 2006) attempted to distinguish the processes tapped by the AAQ from a variety of other strategies (e.g., maladaptive coping, emotional response styles, and controllability). Results indicated that the effects of all of these other strategies on anxiety ratings were partially mediated by the AAQ. Moreover, the AAQ completely mediated the effects of two emotion regulation strategies (i.e., suppression and reappraisal) on daily negative and positive experiences. Experiential avoidance (as assessed by coding the AAQ so that higher scores reflect the opposite of psychological flexibility or acceptance) was also associated with diminished daily positive affective experiences and healthy life appraisals, diminished frequency of positive events and more frequent negative life events, and greater negative affective experiences. These results add to the correlational evidence supporting the role of experiential avoidance as a core mechanism in the etiology of psychological distress (Hayes et al., 2006; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). These results also suggest that cognitive reappraisal (i.e., a primary process of traditional cognitive-behavior therapy) was much less predictive of the quality of psychological experiences and events in everyday life compared with psychological flexibility (Kashdan et al., 2006).

To date, no dismantling designs have been utilized to ascertain the individual effects of experiential avoidance, psychological flexibility, or ACT's other components. Rather, experimental research has been conducted mainly via micro-studies to examine if each is psychologically present and works in accordance to the theory underling ACT (Hayes et al., 2006). Several such studies have been conducted and have focused on the processes of acceptance and cognitive defusion.

The impact of a cognitive defusion technique (i.e., the Milk–Milk Exercise; Hayes, Strosahl et al., 1999) on negative self-referential thoughts was investigated by Masuda and colleagues (Masuda, Hayes, Sackett, & Twohig, 2004). In this exercise, a thought is rapidly repeated out loud until it loses all meaning and is experienced as an abstract sound (e.g., repeating the word “milk” over and over). In this study, the impact of word repetition on the discomfort and believability of self-relevant negative thoughts was investigated as compared to a distraction task (i.e., reading about Japan) or to a thought control task (i.e., involving abdominal breathing training and instructions to shift attention to more pleasant thoughts). Results indicated that the cognitive defusion technique reduced both discomfort and believability of the negative thoughts to a greater degree than did the comparison approaches.

ACT mindfulness techniques have also been examined with respect to their effects on the tolerance of individuals to exposure to carbon dioxide (CO₂)-enriched air (Feldner, Zvolensky, Eifert, & Spira, 2003). In this study, college students scoring high or low on the AAQ, were randomly assigned either to a computerized acceptance-based condition that taught participants to observe and let go of a struggle with feelings during the exposure to CO₂-enriched air or a similar condition that instructed participants to suppress their feelings during the CO₂ inhalation. In the suppression condition but not the acceptance condition, individuals with high experiential avoidance reported greater levels of anxiety relative to those with low experiential avoidance. Participants with high experiential avoidance in comparison to those with low experiential avoidance reported greater levels of anxiety and affective distress, but not physiological arousal, in the exposure to the CO₂. Similarly, researchers (Eifert & Heffner, 2003) found that a 10-min

acceptance condition (i.e., accepting and mindfully observing feelings; Hayes, Strosahl et al., 1999) compared to an emotional-control condition (i.e., controlling psychological experiences by abdominal breathing) or a no-instruction condition, resulted in less behavioral avoidance, less reported intense fear, fewer negative thoughts, and greater willingness to experience the CO₂-inhalation procedure again.

The impact of a brief acceptance task on the exposure of individuals with panic disorder to CO₂-enriched air has also been examined (Levitt, Brown, Orsillo, & Barlow, 2004). Patients were randomly assigned to one of three 10-min audiotaped interventions: acceptance, suppression or distraction. The acceptance-based condition was drawn directly from the ACT manual (Hayes, Strosahl et al., 1999) and focused on the futile and paradoxical nature of experiential control, as well as the importance of focusing on behavior change in alignment with one's values. The acceptance group showed significantly greater levels of willingness to participate in the CO₂-inhalation again and lower level of anxiety than those in comparison groups.

Another study examined the impact of a 90-min ACT protocol focusing on acceptance and defusion strategies on pain tolerance in a cold pressor task (Hayes, Bissett et al., 1999). The ACT protocol addressed the paradoxical effects of emotional control and defusion of thoughts and feelings from the self and was compared to a traditional CBT pain management condition (i.e., training in applying the gate theory of pain) and to a placebo condition consisting of discussion of a behavioral approach to pain. No differences were found in the intensity of pain at post-intervention between groups, but participants in the ACT condition were able to keep their hand in the cold water

significantly longer than the other conditions at post-test and also reported lower levels of belief in pain-oriented reasons for action than the other groups.

This cold pressor methodology was extended in a subsequent study that attempted to determine whether an acceptance and defusion rationale would make a similar difference even if combined with more traditional CBT exercises, rather than ACT acceptance and defusion exercises (Takahashi, Muto, Tada, & Sugiyama, 2002). An ACT-based acceptance and defusion rationale was combined with ACT exercises designed to undermine the literal impact of difficult private events or with exercises designed to control pain. Participants were randomly assigned to either of these two conditions or to an attention-placebo control. Participants in the ACT condition but not those in the other two conditions evidenced positive changes in pain tolerance, suggesting that ACT exercises, and not merely the rationale, were necessary to produce the effect. Another pain tolerance study (Gutierrez, Luciano, & Fink, 2004) examined the impact of a 20-min long ACT protocol encompassing acceptance, defusion and values components as compared to a cognitive and emotional change intervention. ACT participants reported significantly higher tolerance of pain, and significantly greater willingness to persist even after they said the pain levels had reached very high levels.

In summary, research is supportive of the processes of acceptance and cognitive defusion and the concept embodying the opposite of both – experiential avoidance. Significantly, Hayes and colleagues (2006) acknowledge that no other aspects of the ACT model have been specifically investigated within extant ACT component studies, either via experimental or treatment outcome designs. The authors vaguely note in their most recent review that “targeted [micro] studies are underway or completed on all of the

other components (Hayes et al., 2006, p. 14) and that “values-based procedures are just beginning to be tested” (p. 15).

Given the relatively early stages of ACT research and the lack of empirical attention to many aspects of ACT processes and the underlying model (Hayes et al., 2006), it may be fruitful to examine constructs similar to those found in ACT as a way to further understand its processes and techniques. As Hayes and colleagues (Hayes et al., 2006; Strosahl et al., 2004) have noted, the processes within ACT are not unique to ACT. A wide range of concepts and measures seem to overlap with the ACT model, and researchers are beginning to explore connections with such concepts as distress tolerance (Brown, Lejuez, Kahler, & Strong, 2002), thought suppression (Wenzlaff & Wegner, 2000), and decentering (Watkins, Teasdale, & Williams, 2000).

Another construct frequently associated with ACT is that of mindfulness (Baer, 2003). There are several reasons for continued research on the construct of mindfulness as a means to greater understanding of the processes underlying ACT: (1) the first four components of ACT have been defined as the functional behavioral equivalent of mindfulness (Fletcher & Hayes, in press), (2) the majority of ACT strategies are consistent with the general construct of mindfulness and Buddhist psychology in terms of goals and strategies (Eifert & Forsyth, 2005; Hayes, 2002, 2004), and (3) ACT is frequently identified as one of the mindfulness-based interventions within the third wave of behavioral therapies (Baer, 2003, 2006). Thus, the conceptual and empirical bases of this construct and its implications for ACT deserve discussion.

A potential benefit of a strategic integration of the ACT and mindfulness literatures, given the present extent and growth of the latter, is greater elucidation of

especially the first four processes inherent in ACT in terms of conceptual and empirical understanding. Another potential implication of such convergence may be the usefulness of newly developed and complex measures of mindfulness in assessing more clearly these processes beyond that afforded by the vaguely-defined AAQ. Such implications may prove particularly fruitful in attempts at dismantling the mindfulness-related components of ACT from those concerned with values, the focus of the proposed research.

Mindfulness and the Third-Wave Therapies

Conceptualizations of Mindfulness

The development of a *mindful* state reflects a primary practice utilized within past and present Buddhist traditions, in which conscious attention and awareness are actively cultivated via meditation practice (Brown & Ryan, 2003). *Mindfulness* has been defined in various ways by Western practitioners and scientists. However, most descriptions hold true to many of the concepts embodied by original Buddhist writings of mindfulness. Common themes among the most utilized definitions include 1) awareness/attention, 2) present-centeredness, and 3) acceptance of experience, or refrain from judgment. One of the most utilized definitions is that of “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 4).

Western researchers and clinicians who have introduced mindfulness practice into mental health interventions have done so usually by teaching meditative skills independently of the religious and philosophical traditions of their origins (Baer, 2003; Kabat-Zinn, 2000). Meditation practices aimed at increasing mindfulness have been viewed as the intentional self-regulation of attention from moment to moment (Kabat-

Zinn, 1982; Goleman & Schwartz, 1976). Significantly, phenomena that enter the individual's awareness during mindfulness practice, such as perceptions, cognitions, emotions, memories, plans, sensations, or any other experience that comes into the field of awareness, are observed carefully but are not evaluated by any criteria (Marlatt & Kristeller, 1999). Mindfulness-based interventions include many methods for teaching mindfulness. Some of these represent formal meditation practices in which participants sit quietly for periods of time, whereas other practices represent less formal exercises emphasizing mindfulness in everyday routine activities (Baer & Krietemeyer, 2006).

As an outgrowth of the enhanced and open attention to and awareness of current experience, acceptance of the present experience is therefore seen as being inherent in mindfulness (Bishop, Lau, Shapiro, et al., 2004). This acceptance, however, is differentiated from a more layperson's definition of acceptance that signifies a sense of resignation to a present condition of being. Rather, the acceptance fostered by mindfulness practice is a state of acknowledgment that such is the present, that it is not inherently good or bad, and that the individual, rather than being reactive to it, ought to act according to higher-level directives (Hayes et al., 1999; Kabat-Zinn, 1990).

Mindfulness as Operationalized within ACT

Although mindfulness has most clearly been associated with meditative practices (e.g., Kabat-Zinn, 1990), the developers of ACT have proposed that the most scientific way to approach the present-centered willingness to be open to experience as it unfolds that defines the construct of mindfulness is at the level of the psychological processes involved (Hayes & Shenk, 2004). They point out that the construct of attention, from a behavioral point of view, represents a way of speaking about patterns of stimulus control.

Attention viewed in this way is not something an individual has, but rather a quality of a situated action. Furthermore, both “attention to the present moment” and “an attitude of acceptance”, the two components of a prominent operational definition of mindfulness (Bishop et al., 2004), are undermined by normal verbal/cognitive processes according to RFT (Hayes & Shenk, 2004). Conversely, Hayes and colleagues (2004) contend that mindfulness is needed precisely because individuals (1) excessively take language, and therefore their thoughts, literally, and (2) have difficulty attending without constant evaluation of what we consider desirable or undesirable because language-based evaluation represents a natural process that affords such immediate benefits as problem-solving and reduction of undesirable experiences (Hayes & Shenk, 2004).

From an ACT perspective, operationally defining mindfulness as a functional process allows any technique that produces this process (i.e., attention to the present moment and an attitude of acceptance) to be considered a mindfulness technique (Hayes & Shenk, 2004). Hayes and Shenk (2004) acknowledge that meditation offers one particular context for such a process to develop. Through an ACT perspective, meditation teaches an individual that entering into the relational network literally interferes with open contact with the present moment and allows the process of thinking itself to come to the fore, without focus on the content of thought itself. Stated in other words, “meditation creates a context in which experiential avoidance interferes with the process of meditation itself” (Hayes & Shenk, 2004, p. 252). In addition, mindfulness meditation in particular creates a context in which a much broader range of stimulus events are contacted psychologically. Thus, it encourages awareness of all aspects of experiences, even whilst one or more particular aspects may be brought into immediate

focus. The stimulus control exerted by literal language weakens and results in an expansion of the available events, from physical sensations to personal life priorities, in a given situation that may be used to regulate behavior (Hayes & Shenk, 2004).

Proponents of ACT, along with other mindfulness researchers (e.g., Brown & Ryan, 2004), argue that meditation may not be critical to the development of mindfulness and that mindfulness represents an inherent, possible, and natural capacity. What has been deemed necessary is the creation of contexts in which new behaviors can be learned that are not normally fostered by the social/verbal contexts that surround day to day language and cognition (Hayes & Schenk, 2004). Mindfulness exercises in ACT do not rely on meditation per se, yet have been characterized as perhaps the most numerous and varied strategies out of all the mindfulness-based intervention programs (Baer & Krietemeyer, 2006). They include metaphors, imagery, and experiential exercises. Similar to all mindfulness approaches, the techniques of ACT encourage individuals to step out of the struggle or war with their internal experience and give up ineffective experiential avoidance strategies by focusing on the impact of, and response to, thoughts, feelings, and sensations (Bishop et al., 2004; Hayes et al., 1999).

Empirical Status of Mindfulness-Based Treatment Approaches

Over the past 20 years, mindfulness and the various techniques employed to develop it, have been incorporated by Western scientist-practitioners within several specific third-wave cognitive-behavioral interventions. Each approach similarly conceptualizes mindfulness practice as a set of skills that may be learned via instruction and developed through continued utilization. Examples of interventions specifically based on mindfulness training include the Mindfulness-Based Stress Reduction program

(MBSR; Kabat-Zinn, 1982, 1990), developed in a behavioral medicine setting for individuals with a wide range of chronic pain and stress-related disorders, and Mindfulness-Based Cognitive Therapy for Depression (MBCT; Teasdale, Segal, and Williams, 1995; Segal, Williams, & Teasdale, 2002), based largely on MBSR and aimed at preventing relapse of major depressive episodes. Both interventions have demonstrated positive outcomes in empirical studies at post-treatment and follow-up on their targeted outcomes across both clinical and nonclinical populations (see Baer, 2003 for a review).

There are also several interventions that incorporate mindfulness training within a cognitive-behavioral theoretical framework. These include Dialectical Behavior Therapy (DBT; Linehan, 1993), a multifaceted approach to the treatment of borderline personality disorder. Although the components of the protocol have not been individually evaluated via dismantling research, DBT has been associated with decreased parasuicidal behavior, psychiatric hospitalization, and anger, and with increased client retention, level of functioning, overall social adjustment, and employment performance (see Scheel, 2000, for a recent review). In addition, mindfulness has recently been incorporated with established cognitive-behavioral strategies aimed at substance abuse relapse prevention to form Mindfulness-Based Relapse Prevention (Witkiewitz, Marlatt, & Walker, 2005; Marlatt, 1994). Preliminary outcomes of this approach include decreased frequency and quantity of drinking and drug use and improvements of substance-use related problems (Witkiewitz et al., 2005).

Mindfulness and acceptance-based strategies have also been examined with respect to specific types of pathology, such as anxiety disorders (Eifert & Forsyth, 2005;

Orsillo & Roemer, 2005). The evidence base for the most researched mindfulness treatments indicates they are effective at reducing various types of distress in diverse populations (Baer, 2006). In addition, one meta-analysis of the literature specific to MBCT, MBSR, or variants of MBSR, suggests that on average, mindfulness-based interventions have yielded at least medium-sized effects, with some effects falling within the large range (Baer, 2003). However, most of these approaches represent multicomponent interventions and, similarly to ACT, have yet to undergo empirical scrutiny of their individual components.

Possible Mechanisms Underlying Effects of Mindfulness

The authors and subsequent researchers of the various mindfulness-based treatment approaches have suggested several mechanisms that may explain how mindfulness skills can lead to symptom reduction and behavior change. Some of the more commonly discussed mechanisms of action include relaxation, exposure, self-regulation, and acceptance (Baer, 2003; Shapiro, Carlson, Astin, & Freedman, 2006).

The induction of relaxation through various meditation strategies has been well documented (e.g., Benson, 1975) and some researchers have suggested that meditation often induces relaxation, which may contribute to the management of certain stress-related or medical disorders (Goldenberg et al., 1994; Kabat-Zinn et al., 1998). However, the relationship between meditation and relaxation is complex. Specifically, the purpose of mindfulness training is not the induction of relaxation, but nonjudgmental awareness of present experience, which may include autonomic arousal, racing thoughts, muscle tension, or other phenomena incompatible with relaxation states (Baer, 2003). In

addition, evidence suggests that relaxation effects are not unique or necessary to meditation, but are so with respect to many relaxation strategies (Shapiro, 1982).

Mindfulness has been hypothesized by some (e.g., Kabat-Zinn, 1984; Kabat-Zinn et al., 1992; Linehan, 1993) to act through the process of exposure given that it involves prolonged exposure to various distressing thoughts and sensations with active withholding of emotional reactivity to them. Although such a process is similar to the cognitive-behavioral strategy of interoceptive exposure (e.g., Barlow & Craske), its occurrence within mindfulness training does not include the deliberate induction of distressing symptoms. Given that the attention encouraged by mindfulness meditation is one of nonjudgmental observation and non-reactance to what is observed, it appears to allow an individual to observe and over time become desensitized from the impact of aversive thoughts, feelings, and sensations. This desensitization weakens the influence of private events on behavior and is hypothesized to lead to the extinction of fear responses and avoidance behaviors previously elicited by these stimuli (Baer, 2003; Segal, Williams, & Teasdale, 2002).

Mindfulness, particularly as a meditative strategy, has long been viewed as a self-regulation technique. Initial examination of meditation from a behavioral analysis framework originated in the 1960s and 1970s (see Shapiro & Zifferblatt, 1976 for review). The practice of discriminating a stimulus (e.g., wandering attention) developed in meditation may generalize to situations involved in behavioral self-control strategies. An individual may increase his or her skills at detecting distracting/disinhibiting stimuli as soon as such stimuli are present and be able to avoid reacting to them automatically (Shapiro & Zifferblatt, 1976). More recent evaluations have also suggested that the

improved self-observation that results from mindfulness practice may facilitate an individual's ability to recognize internal and external cues throughout the day, cues that may represent early signs of a depressive episode (Teasdale et al., 1995) or encourage substance use (Marlatt, 1994). Such improved self-observation may also aid the individual in recognizing the consequences of specific actions, which may lead to more effective coping and behavioral choices (Linehan, 1993).

As discussed previously, acceptance represents the intentional stance adopted during mindfulness practice. All mindfulness-based interventions include acceptance of pain, thoughts, feelings, urges, and other bodily, cognitive, and emotional phenomena, without trying to change, escape, or avoid them. For example, acceptance of thoughts as “just thoughts”, rather than reflections of truth or reality, may lead to decreased avoidance behaviors (Kabat-Zinn, 1982, 1990), and a novel and insightful way of relating to cognitions in general (Teasdale et al., 1995). Such acceptance may also be applied to the experience of self-regulation itself and unpleasant states (e.g., anxiety, frustration) which may occur during that context. For example, acceptance of unpleasant thoughts or feelings may be helpful during a stressful situation involving difficult and unchangeable circumstance, when action is needed irrespective of the presence of internal distress. In addition, previous research has also suggested that if individuals can learn to focus on the task at hand (e.g., by learning acceptance), then they are better able to notice and respond effectively to even subtle changes in contingencies of reinforcement (e.g., situations in which they have and can use control, e.g., Catania, Shimoff, & Matthews, 1989; Hayes, Zettle, Rosenfarb, 1989).

Workplace Stress Management as a Clinical Target for ACT

Stress and Its Impact

The concept of “stress” has been examined in numerous ways since Hans Selye (1956), who gave momentum to much of the early stress research, defined stress as the nonspecific response of the body to any demand. Stress is now generally defined as the product of an imbalance between appraisals of environmental demands and individual resources (Lazarus & Folkman, 1984). Thus, the term “stress” has been differentiated from the construct of a “stressor”, or the objective or perceived demand on an individual itself. In addition, stressors have also come to be operationally differentiated from “strains”, or the negative psychological and physical responses to these demands (Jones & Bright, 2001).

Over the past two decades, there has been a growing recognition of the relationship between human psychological and physical health (Cohen & Herbert, 1996; Herbert & Cohen, 1993). Psychological functioning, and in particular exposure to stressful life experiences and associated emotional reactions, has been implicated as a potential contributor to a wide range of mental and physical diseases and symptoms (Lovallo, 1997). Negative outcomes associated with stress include higher blood pressure, elevation in cholesterol levels, ulcers, and coronary heart disease (Goodspeed & DeLucia, 1990; Krantz & McCeney, 2002; Levi, 1996). Chronic psychological stress has been most frequently implicated in maladaptive immune functioning and ill health (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Natelson, 2004).

Numerous negative psychological correlates of stress have also been identified. The most commonly observed psychological strains include depression (Dinan, 1994;

Hammen, 2005) and anxiety (Friedman, Clark, & Gershon, 1992). In addition, research suggests that a general negative affective style, marked by tendencies toward depression and anxiety, is associated with increased stress hormone levels (Anisman & LaPierre, 1982) and somatic complaints (Costa & McCrae, 1987). Moreover, coping reactions to stress that focus on avoidance of distressing emotions or concerns and bringing about immediate pleasurable experience, such as use of psychoactive substances (e.g., alcohol and tobacco) or emotional eating, have been shown to be maladaptive in the long-term for both psychological and physical well-being (Dunn, Fargher, Thorogood, et al., 1999; Fletcher, 1988; Greeno & Wing, 1994; Ingledew, Hardy, & Cooper, 1996; Morley, Levine, & Rowland, 1983; Roskies, 1991; Willis, 1990)

The Transactional Theory of Stress

One of the most supported theories of stress, the transactional theory developed by Lazarus and colleagues (Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus & Folkman, 1984), conceptualizes the stress process as an individual experience in which context represents the crucial factor. According to this model, psychological stress represents “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (Lazarus & Folkman 1984, p. 19). This approach implies that stress is a dynamic process rather than a static occurrence, given that the interaction between the individual and the environment changes as either factor varies over time and over different contexts.

According to the transactional model of stress, appraisal (i.e., the evaluation the individual makes of the demands and resources available to deal with them) represents a

key ingredient in the stress process. The theory proposes that a transaction between the person and the environment is stressful only when it is appraised as a harm, threat or challenge to that person's well-being (Lazarus, 1995). In this definition of stress, harm is defined as damage that has already occurred (e.g., death of a spouse or loss of a job), whereas threat refers to a harm that has not yet happened but is anticipated to occur. An individual will appraise a situation as a challenge when he or she believes that he or she has the capacity to master high demands, overcome obstacles, and grow as an individual. The appraisal of challenge, then, allows one to feel enthused and engaged, and experience personal growth, whereas an appraisal of harm leads to feeling endangered, defensive, and self-protective (Lazarus, 1995). This conceptualization of stress allows for positive outcomes to result from stress, not just negative effects, and has implications for stress interventions in terms of targeting the appraisal process for better well-being outcomes in the face of stressors.

In addition, it is within the appraisal process that personal values and goals play a role in stress and its outcomes. Lazarus and Folkman (1984) propose that secondary appraisal, in which coping options for dealing with harm, threat, or challenge are assessed, is integrated with a primary appraisal process. Primary appraisal concerns whether or not there is any personal stake in the encounter in order to ascertain in the first place whether it is perceived as a harm, threat, or challenge, or, if the situation is perceived as not significant for one's well-being, as requiring no action. The idiosyncratic nature of personal goals and beliefs coupled with the complexity and ambiguity of environments leads individuals to attend selectively to experience and evaluate it in diverse ways (Lazarus, 1995). The transactional process model of stress is

thus similar to ACT's process-oriented contextual approach and emphasis on personal values.

Coping

According to transactional theories of the stress process, various strategies are likely to be made in response to sources of pressure as an individual attempts to cope with the psychological and physical demands. Coping has been defined as “the person's cognitive and behavioral efforts to manage (reduce, minimize, master or tolerate) the internal and external demands of the person-environment transaction that is appraised as taxing or exceeding the person's resources” (Folkman et al., 1986, p. 572). It is when these coping strategies fail that an individual will experience negative stress outcomes, such as physical or mental ill-health (Lazarus & Folkman, 1991).

Coping itself leads to many changes within the stress process because it provides new information that feeds back to the individual and alters subsequent appraisals (Lazarus, 1995). Coping also has a profound effect on psychological stress and emotional states (Folkman & Lazarus, 1988a, 1988b). Coping ability plays a significant role in the appraisal process, which is always the proximal cause of reactions to stressors (Lazarus, 1995). Research has shown that certain patterns of coping vary from one stressful encounter to another and over time (e.g., seeking social support), whereas some strategies (e.g., positive thinking) may remain relatively stable (Folkman & Lazarus, 1985; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Folkman, Lazarus, et al. 1986; Lazarus, 1995). Thus, coping and appraisal are both central to the stress process and its outcomes for the individual in terms of adapting to demands. They interact and influence an individual's self-regulation of the cognitive, emotional, and behavioral

actions taken (Carver, Scheier, & Weintraub, 1989; Lazarus, 1995; Scheier & Carver, 1988).

Interventions for Stress Management from First- to Third-Wave CBTs

Individual-focused stress management training, as an intervention approach, encompasses a wide assortment of techniques. The majority of traditionally employed approaches fall under the categories of meditation, biofeedback, muscle relaxation, and cognitive-behavioral skills training (Jones & Bright, 2001). The development and relative use of the various interventions has paralleled the development of cognitive-behavioral therapies from the first through the second and now into the third generation. During the 1970s, interventions first began to incorporate relaxation techniques stemming from systematic desensitization (e.g., Goldfried, 1971; Wolpe, 1958), one of the first generations of behavior therapies (Newman & Beehr, 1979; Peters, Benson, & Porter, 1977). Subsequently, the development of cognitive-based approaches by Beck (1976) and Ellis (1962) heralded in a second generation. Since the 1980s, the principles and procedures from these cognitive therapies have become central to common utilized stress management interventions (e.g., stress inoculation training: Michenbaum, 1985; 1993; Saunders, Driskell, Johnson, & Salas, 1996). Presently, the third-wave of cognitive-behavioral therapies has ushered in a novel perspective on stress and intervention approaches.

The nature of mindfulness makes it particularly suitable to approaches aimed at the self-regulation of reactions to stressors. Following practice, the core characteristic of mindfulness may become reflected in regular or sustained consciousness of ongoing events, the individuals' reactions to those events, and the consequences of those reactions

(Brown & Ryan, 2004). Mindfulness may, in fact, with practice, increase feelings of control as an individual realizes his or her previous negative reactions to such cues were in fact automatic and “mindless”, rather than self-controlled and “conscious”.

As mindfulness involves receptive attention of not just physical, but also cognitive and emotional aspects of the present, individuals attempting self-regulation of their stress response may become more aware of their internal thoughts and emotional reactions. Significantly, rather than attempting to then challenge and augment them (as is the case in cognitive restructuring techniques), an individual practiced in mindfulness can acknowledge their presence and maintain focus on even higher-level priorities, such as values, when deciding how to react. Interestingly, mindfulness is distinguishable from other forms of self-awareness, including that espoused in self-control theory (Carver & Scheier, 1981) and self-monitoring strategies (Snyder, 1974). Such forms of self-awareness do in fact reflect cognitive operations on aspects of the self through self-examination, processes collectively termed “reflexive consciousness” (Baumeister, 1999). Mindfulness directed inward differs from such approaches in that its mode of functioning is perceptual or “pre-reflexive”, operating on, rather than within, thought, feeling, and other contents of consciousness (Brown & Ryan, 2003). In such a manner, mindfulness in effect can “free” individuals struggling with the cognitions and emotions that influence their ability to self-regulate behavior, whether it is in response to a stressor or any other experience.

As previously discussed, ACT heavily encompasses mindfulness constructs and differs from the change-based stress management interventions of cognitive restructuring and relaxation training in its theoretical basis and techniques utilized. Traditional

cognitive restructuring focuses on identifying and challenging distortions in individuals' thought content, beliefs regarding their coping abilities, and what affects their well-being, in order to change their emotional reactions to a situation (Beck, 1993). However, as noted previously, research has indicated that direct change in thought content is not necessary for positive outcomes.

Traditional relaxation training also has as its focus the reduction of unpleasant experience. Specifically, it targets the physiological arousal that occurs as a response to perceived stress. Outcome research indicates positive effects on indices of physical arousal from relaxation training (e.g., Borkovec & Whisman, 1996; Keable, 1985), as well as positive outcomes in individuals dealing with headache (Holroyd & Penzien, 1994), chronic pain (Wilson & Gil, 1996), and insomnia (Lichstein & Riedel, 1994). However, this approach treats physiological aspects of stress once they have already occurred, rather than attempting to prevent such symptoms of strain from occurring. Thus, such a technique does little to help empower the individual to react differently to stress so that strain and its physical symptoms do not occur or, if they occur, their impact on actual behavior is minimal.

In contrast to the teaching of different forms of control and struggle with unpleasant internal experience that underlies virtually all common stress management interventions, an ACT-based approach to stress entails the inherent premise that it is not the content of thoughts, feelings, or sensations per se that directly leads to stress-related disorders, but how individuals relate to this content and experience (i.e., the context; Bond, 2004). Specifically, stress will lead to problems when people (1) “fuse” or completely buy into the literal meaning of their thoughts (e.g., if I have the thought, “I

can't handle this task", then I can't handle this task) and (2) avoid the experiences that come about in response to or along with their thought content (e.g., anxiety). According to the ACT model, fusion together with avoidance "causes" stress as much as the stressor itself because it helps determine whether experience with a stressor (e.g., a new job assignment is evaluated as "not fair") leads to stressful reactions (e.g., anger and anxiety), maladaptive coping (e.g., denial), and even additional stressors from chosen behaviors based on avoidance (e.g., wanting to quit or yell at supervisor; Bond, 2004).

Given that the mindfulness components within ACT and other third-wave interventions encourage individuals to relate differently to their thoughts, feelings, and sensations (i.e., via psychological acceptance and defusion rather than attempts to challenge, change, or control them), such approaches may be particularly suitable for interventions aimed at stress management. Specifically, psychological acceptance of and distancing from unpleasant thoughts and emotions may be the most effective (if not the only) strategy when such thoughts and emotions stem from unalterable stressors (e.g., an unavoidable deadline). In addition, given that context rather than content is the focus of ACT and it has proven effective across diverse mental and physical health domains, ACT should be applicable to the dynamic and idiosyncratic experience of stress. Furthermore, utilizing an ACT conceptualization of mindfulness and its less-meditation oriented techniques may allow for easier dissemination to and adherence by a wider population than contemplative-based approaches, such as MBSR.

The Evolvement of Approaches Specific to Work Stress

Considering that individuals who work full-time spend more of their waking hours at work than anywhere else, it is not surprising that work represents a major, if not

the most significant, source of stress for many individuals. Nationally representative data obtained from the General Social Survey in 1998 indicated that 36% of US workers reported their jobs to be "often" or "always" stressful, similar to 39% in 1989 (General Social Survey 1972-2000 Cumulative Codebook, 2002, as cited in Murphy & Sauter, 2003). Similarly, the Families and Work Institute's 1997 National Study of the Changing Workforce in the United Kingdom reported that 26% of workers said they were "often" or "very often" burned out or stressed by their jobs (Bond, Galinsky, & Swanberg, 1998). In addition, research in occupational health has found that exposure to work-related stress is associated with increased risk of infectious disease (e.g., Cohen & Williamson, 1991; Schaubroeck, Jones, & Xie, 2001), musculoskeletal complaints (Lundberg et al., 1999; Carayon, Smith, & Haims, 1999), asthma, ulcers, and stroke (Quick, Quick, Nelson, & Hurrell, 2001).

Beyond physical complaints, perceived work stress has also been associated with mood disorders (e.g., depression and anxiety; Griffiths, 1998; Revicki, Whitley, Gallery, 1993; Wang, 2004, 2006) that are associated with the development of a broad range of diseases (e.g., coronary artery disease, asthma, headache, ulcers, arthritis; Brydon, Magid, & Steptoe, 2006; Friedman & Booth-Kewley, 1987; Johnson & Indvik, 1997). Beyond causing individual workers considerable suffering, the symptoms of stress also significantly affect absenteeism and productivity levels within organizations (Levi, 1996).

Stress has also been shown to contribute to job burnout, ill-health, high workforce turnover, lowered morale and reduced efficiency and performance (Sutherland & Cooper, 1990), as well as lower levels of job satisfaction and motivation (Goodspeed & DeLucia,

1990). As a result, the financial impact on employers due to physical and psychological illness among their employees is tremendous and various estimates of that impact abound. For example, Greenberg and colleagues (Greenberg, Finkelstein, & Berndt, 1995) estimated the direct costs associated with work-related stress and depression at \$12 billion a year. Other researchers have found that an employer's insurance and disability expenditures can be reduced when fewer employees suffer from chronic illnesses (Gebhardt & Crump, 1990). The cost of psychological disorders in the workforce is also significant. The individual- and work-related consequences of depression, a previously noted correlate of stress, include absenteeism, job turnover, cognitive difficulties, coronary heart disease, decreased productivity, and increased alcohol intake (Johnson & Indvik, 1997; Sheffield, Dobbie, & Carroll, 1994).

The implementation of employee stress management or wellness programs is one contemporary approach utilized to address such individual and organizational costs of workplace stress. Reviews of the scientific literature over the past 20 years reveal a steadily increasing number of studies regarding stress interventions (Bunce, 1997; Murphy, 1984, 1996; Newman & Beehr, 1979; Van der Klink, Blonk, Schene, & van Dijk, 2001). These reviews point out that most worksite stress intervention studies involve efforts to help employees manage stress (i.e., stress management) with only an occasional intervention directed towards reducing the actual sources of stress at work (i.e., stressor reduction).

Influential in interventions aimed at stressor reduction, the construct of job control is arguably the most researched work characteristic in occupational stress research (e.g., Frese & Zapf, 1994; Hackman & Lawler, 1971; Karasek, 1979). Job

control has been defined as a perceived ability to exert some influence over one's work environment in order to make it more rewarding and less threatening (Ganster, 1989). Terry and Jimmieson (1999, p. 131) noted, in their review of the research literature on this construct, that there appears to be "consistent evidence" that high levels of worker control are associated with low levels of stress-related outcomes, including anxiety, psychological distress, burnout, irritability, psychosomatic health complaints, and alcohol consumption. Furthermore, Bond and Bunce (2001) found that a work reorganization intervention could improve workers' mental health, absenteeism levels, and self-rated performance by increasing their job control.

Although influencing worker levels of behavioral control over the characteristics of their jobs represent a commonly espoused approaches to organizational-level stress reduction (e.g., Quick et al., 1997), individualized stress management interventions are more prevalent than stressor reduction interventions (e.g., Ganster & Murphy, 2001; Giga, Cooper, & Faragher, 2005). This finding may be due in part to the prevalent belief in US organizations that stress is a personal, not work-related, problem (Murphy & Sauter, 2003). Also, research suggests that stressor reduction approaches are not routinely effective in lowering worker levels of stress, producing small or insignificant effects on levels of distress (e.g., Murphy, 1996; Parkes & Sparkes, 1998; Van der Klink et al., 2001). In addition, organizations are reluctant to make global organizational changes due to the cost and disruption of implementing such strategies given the relatively small percentage of employees who exhibit truly impairing stress conditions (Cooper & Payne, 1992).

Conversely, Flaxman and Bond (2006) note a number of features of the stress process that support the use of individual-focused worksite interventions. First, some work-related stressors (i.e., deadlines and difficult customers) cannot realistically be removed or augmented. Second, there are numerous sources of stress that stem from outside the workplace and are not amendable via organizational-level interventions, yet nevertheless can have a detrimental impact on an employee's well-being. Finally, the authors note the ever-growing use of the transactional model of stress, with its emphasis on intra-individual processes, in workplace interventions (e.g., Cummings & Cooper, 1979).

Numerous individual difference factors have been investigated in relation to stress in general and in the field of occupational psychology (see Cooper & Payne, 1991, and Jex, 1998 for reviews). Two of the most prominently studied dispositional factors that have been specifically examined in ACT-based and other interventions for workplace stress include negative affectivity and locus of control (Payne, 1988).

The term negative affectivity describes an aversive (e.g., angry, scornful, fearful, depressive) emotional style or trait that can exist even in the absence of objective stressors (Watson & Pennebaker, 1989). Some individuals are predisposed to perceive themselves in a negative light, that is, they are high in negative affectivity (Watson & Clark, 1984), and are, therefore, more likely to perceive certain situations as stressful. Research has indeed found that individuals high in negative affectivity are more likely to report stress symptoms (Moyle, 1995; Parkes, 1990). Parkes (1990) suggests that negative affectivity has a moderating influence on the stress-strain relationship, making high negative affectivity individuals more vulnerable to perceived stress.

In some respects a forerunner of the idea of self-efficacy (Bandura, 1977), the construct of locus of control (Rotter, 1966) has been commonly examined with relation to stress (Hurrell & Murphy, 1991; Jones & Bright, 2001). As a psychological construct, control has been broadly defined as the perception that an individual has a response available that can influence the aversiveness of an event (Thompson, 1981). Researchers have been concerned with the effects of perceived control over important outcomes for several decades (e.g. Rotter, 1966). Numerous investigations suggest that, in general, control is associated with a myriad of positive outcomes, and lack of control with various forms of ill-health (see Miller, 1979 and Thompson, 1981, for reviews).

Furthermore, the evidence suggests that just the belief that one can exercise control may be sufficient to reduce strain when exposed to uncontrollable events (Gatchel, 1980). Such evidence has particular implications for stress management interventions aimed at situations in which stressors may not be subject to the individual's attempts at change, such as a work environment that offers the worker little job control. Engagement in control strategies may still be potentially effective, however, if they are targeted towards an individual's reactions, emotional and cognitive, to present circumstances. Thompson (1981), for example, has developed a typology of control that, beyond behavioral control, also includes the concept of cognitive control. Behavioral control refers to a belief that a behavioral response is available that can terminate the event, make it less probable or less intense, or change the duration or timing. Cognitive control is defined as the belief that a cognitive strategy is available that can affect the aversiveness of an event. This type of control may be said to be an ultimate aim of mindfulness-based approaches. Such approaches view private events (i.e., thoughts and

feelings) as the more direct cause of distress than the environmental stressor and strategies. Within those approaches, the manner in which an individual relates to such cognitive and emotional reactions is targeted.

Locus of control describes the extent to which individuals believe that they influence events in their lives, and so relates to cognitive control. Individuals with an internal locus of control perceive that they can manage situations with their decisions and behaviors. Individuals with an external locus of control believe that what happens to them is beyond their influence—a result of luck, fate, or other circumstance (Rotter, 1966). People with the latter orientation are thought to be most at risk for experiencing mental ill-health and poor functioning (Newton & Keenan, 1990; Rotter, 1966; Spector, 1986; Spector, 1988). Hurrell and Murphy (1991), for example, argue that individuals with an internal locus of control suffer from fewer stress symptoms as they are more likely to define stressors as controllable and take proactive steps to cope with them.

Furthermore, research has shown that locus of control, as well as negative affectivity, have the potential to bias, or distort, individual's self-reports on a wide range of variables, from work characteristics (e.g., job control) to well-being (e.g., mental health, job satisfaction) to coping behaviors (e.g., problem- or emotion-focused coping; Parkes, 1991; Siu, Spector, Cooper, Lu, & Yu, 2002; Spector, 1986). Specifically, people with higher levels of negative affectivity (who perhaps already feel depressed or anxious) may discount the extent to which they accept their unwanted thoughts and feelings. Likewise, individuals with an external locus of control may underestimate the degree to which they are able to take action (or manage situations), especially in the face of unpleasant internal events.

Taking such factors into account, individual-oriented, stress management interventions directly address the idiosyncratic nature of stress more than job-oriented stress interventions. Individual-focused strategies are generally designed to enhance workers' personal resources for coping and to reduce the negative symptoms, or strains, of stress. Such individual-focused programs have been found to be generally effective in reducing both physical and psychological manifestations of strain in workers (Murphy, 1984; van der Klink et al., 2001). For example, in a recent meta-analysis, van der Klink and colleagues (2001) reviewed 43 worksite stress management intervention studies and found a medium effect size for both cognitive-behavioral interventions and multimodal programs that consisted of a mixture of cognitive-behavioral therapy and relaxation techniques across a variety of psychological health and coping measures. The researchers also found a small effect size for relaxation training. Individual stress management training has not, however, been found to cause significant changes in job satisfaction (Bunce, 1997; Murphy, 1996; Van der Klink, et al., 2001).

When examining worksite stress management programs over the last three decades, their changes in content and intervention strategies have mirrored the evolution within the cognitive-behavioral paradigm in clinical psychology discussed previously (Flaxman & Bond, 2006). In view of such a synchronous relationship between cognitive-behavioral therapies and stress management, it would seem that the development of third-wave mindfulness-based approaches has significant implications for individual-focused stress interventions aimed at the workplace (Flaxman & Bond, 2006).

Despite its growing popularity and its inclusion in third-wave cognitive behavioral interventions, the concept of mindfulness is only just beginning to have an

impact on occupational health psychology. Recent research, however, has shown the potential benefits for specifically applying mindfulness to the work context. For example, Williams and colleagues (Williams, 2006; Williams, Kolar, Reger, & Pearson, 2001) have found that the MBSR program resulted in significant decreases in daily hassles, psychological distress, and medical symptoms for a sample of 104 “stressed-out” university employees at post-treatment and to an even greater extent at 3-month follow-up compared to a control group. In addition, a small uncontrolled investigation that combined MBSR and values clarification (Scardapane, Walling, Mittal, et al., 2005) for university employees also indicated improvement in numerous symptoms.

Moreover, psychological acceptance, as operationalized in ACT, has been investigated as a moderator between job control and occupational health and productivity in a large sample of call center employees (Bond & Bunce, 2003; Bond & Flaxman, 2006). Another goal of this research was to determine whether mental health, job satisfaction, and work performance also predicted levels of acceptance and job control 1 year later. Such “reciprocal” relationships run contrary to relevant theories (e.g., Hayes, 1987; Karasek & Theorell, 1990).

Using structural equation modeling within a design in which data were obtained on two occasions from the same set of participants, the researchers found that acceptance did interact with job control. Specifically, findings from this study suggested that higher levels of acceptance at Time 1 serve to increase the association between higher levels of job control at Time 1 and better mental health, performance, and ability to learn new computer software skills at Time 2. This strengthening effect is consistent with the model of acceptance (Hayes et al., 1999) in that individuals who do not try to avoid or control

psychological events have more attentional resources and engage in less avoidant behavior (Bond & Hayes, 2002). Bond and Bunce (2003) suggest that these individuals are better able to notice the degree to which they have control in a given work situation. Moreover, because they are less avoidant, they may, through experience, learn how they can most effectively use the control that they have to promote their mental health. Through this same trial and error mechanism, individuals can also maximize their work performance, if they value and have the goal of performing well at work. The results for acceptance in this study reflect the findings from the randomized controlled outcome study by Bond and Bunce (2000).

In addition, results from the study by Bond and Bunce (2003) indicated that higher acceptance levels predicted better mental health and performance 1 year later. The longitudinal effects of acceptance were unidirectional, in that mental health, input errors, and job satisfaction at Time 1 were not associated with acceptance at Time 2. These findings are consistent with acceptance theory (Bond & Hayes, 2002; Hayes, 1987; Hayes et al., 1999). Moreover, in addition to its interaction with acceptance, job control also produced several main effects in the study. Specifically, higher job control levels at Time 1 predicted better mental health, job satisfaction, and performance at Time 2. None of the three outcomes at Time 1, however, predicted job control at Time 2. These main effects for job control are consistent with models of occupational health and performance (e.g., Hackman & Lawler, 1971; Karasek, 1979) and with previous findings suggesting that the longitudinal effects of job control are unidirectional in nature (e.g., DeJonge et al., 2001).

Contrary to one of their hypotheses, however, the authors did not find that acceptance longitudinally predicted job satisfaction, either directly or indirectly through an interaction with job control. The authors account for this nonsignificant finding by noting that the relationship between acceptance at Time 1 and job satisfaction at Time 2 was calculated after controlling for relationships that the other predictors have with these two variables (Bond & Bunce, 2003). Given the strong relationship between job control and job satisfaction, it is possible that Time 1 acceptance could not account for a significant amount of residual variance in job satisfaction once job control was taken into account. In other words, acceptance may well be associated with job satisfaction, but this relationship becomes nonsignificant once job control, a more important predictor of job satisfaction, is taken into account.

The authors also controlled for negative affectivity and locus of control as possible confounds in this study. The authors did in fact find that higher negative affectivity at Time 1 predicted greater levels of mental ill-health, job dissatisfaction, and decreased performance at Time 2. These findings are consistent with those from previous research (e.g., Brief & Roberson, 1989; DeNeve & Cooper, 1998). In addition, consistent with prior research (e.g., Jex, 1998; Parkes, 1991), Bond and Bunce (2003) found that individuals with a greater external locus of control at Time 1 experienced lower levels of job satisfaction at Time 1 and worse mental health at Time 2.

Including negative affectivity and locus of control in the study allowed the authors to control for any spurious associations that they may have caused between the variables of interest. In doing so, the researchers were able to demonstrate incremental validity of acceptance in terms of its ability to predict mental health and job performance,

both directly and when interacting with job control. As a result, it appears that the predictive effects of acceptance are independent of those that stem from negative affectivity and locus of control.

Existing Research on ACT for Stress Management at Work

To date, a handful of studies have examined ACT for workplace stress. One randomized but preliminary trial focused on physical strain from work stress (Dahl et al., 2004). The authors compared medical treatment as usual (MTAU) with four 1-hour weekly sessions of ACT in addition to MTAU for nineteen public health service workers reporting chronic stress or pain who were at risk for high sick leave utilization. Results indicated that those receiving ACT had fewer sick days and fewer medical visits than those in the MTAU-only condition at post-treatment and, to an even greater extent, at 6-month follow-up. Furthermore, these improvements could not be accounted for by remission of stress and pain in the ACT group, as no between-group differences were found for these symptoms.

The remaining studies of ACT for workplace stress have focused on psychological well-being as well as work-related outcomes. These studies have evaluated a manualized stress intervention for use in the work environment developed from the strategies and techniques found in the psychotherapy version of ACT (i.e., Hayes et al., 1999). The first study to evaluate this ACT-based worksite stress management intervention was conducted by Bond and Bunce (2000). To test the efficacy of ACT using a brief, group-based implementation method conducive to the workplace, the authors of this and the subsequent two trials of the intervention (Flaxman & Bond, in preparation) utilized a “2+1” method of delivery in the trials. This method entails having

participants receive three, three-hour sessions, two on consecutive weeks, and a third session three months later, with a follow-up assessment three months after that.

The initial trial by Bond and Bunce (2000) compared ACT with a wait-list control group and a problem-focused intervention (IPP). The goal of IPP is to encourage people to identify and change stressors in their workplace rather than changing their emotional reactions to those stressors. ACT significantly improved general health from the second to the third session and the first to the fourth session, and general health scores were significantly better at the third session and at follow-up compared to those of the IPP group and control group. The ACT group also evidenced significantly lower depression levels between the second and third session and significantly higher scores on a work-related variable (propensity to innovate) from the second to the third and from the first session to the follow-up assessment. According to Cohen's (1977) criteria for the effect size index of eta-squared (η^2), these improvements ranged from medium (for depression) to large (for general mental health and propensity to innovate) magnitudes of effect. In this study, ACT did not influence level of job satisfaction or motivation.

There have been two subsequent randomized controlled trials of ACT for work stress management (Flaxman & Bond, in preparation). The first study compared ACT to a traditional cognitive-behavioral stress management program based on stress inoculation training and a wait-list control condition. Individuals in both treatment groups reported large improvements in mental health between baseline and at session 3 and again 3 months after that. Increases in psychological acceptance mediated mental health improvements for the ACT group whereas reductions in dysfunctional (i.e., negative) cognitions served as the mediator for the CBT group.

The second study, comparing ACT to a control group, found that, similar to the CBT group, ACT produced large improvement in general mental health, as well as significant reductions in frequency of dysfunctional cognitions (especially between baseline and 6 month follow-up). Again, a reduction in dysfunctional thoughts was not found to be the mechanism behind improved mental health for the ACT group. Instead, this improvement was mediated by increases in psychological flexibility (as assessed by the AAQ). However, this finding indicates that an acceptance-based intervention may not only initially change how employees relate to their thoughts but also that, in the long term, may result in changes to thought content as well.

Thus, there is now both a longitudinal panel study and three longitudinal, experimental outcome studies that indicate the importance of psychological acceptance to mental health and performance in different organizations within different industries. Moreover, these positive results are maintained even when accounting for job control, negative affectivity, and work locus of control. Coupled with the other reviewed applications of ACT and MBSR in the workplace, it appears that mindfulness has clear benefits for decreasing psychological and physical strain symptoms and improving work-related outcomes, with psychological acceptance as a main mechanism of action.

Limitations of the existing literature on ACT for workplace stress are plentiful, however. For example, Bond and colleagues did not utilize assessment of out-of-session practice of intervention skills and only used limited assessment of work-related and non-work-related stressors, well-being and work-related outcomes, and possible mediating factors beyond that of acceptance/flexibility (Bond & Bunce, 2000; Flaxman & Bond, 2006). Moreover, these studies, as well as others examining ACT as an intervention for

other applications, have not examined if and how the values components of the ACT protocol adds to the effects of the intervention beyond that of the mindfulness components.

Values in ACT: What May They Add Beyond the Effects of Mindfulness

As noted above in the discussion of the processes in ACT, the last two components of the ACT protocol involve the identification of personal values in various life domains and the setting of and follow-through on goals based on these values. Participants use skills learned within the mindfulness components as aids to maintain behavioral commitment to such goals (Hayes et al., 1999; Hayes et al., 2006). However, these components have not undergone any empirical evaluation within the ACT literature. Moreover, some researchers (Shapiro et al., 2006) have suggested that the open, intentional awareness cultivated by mindfulness practice may by itself lead individuals to act in ways that are more congruent with their values and interests. One possible mechanism of such an effect may be the expansion of an individual's repertoire of possible behaviors, coupled with increased awareness of their distinct consequences (Brown & Ryan, 2003; Ryan, Kuhl, & Deci, 1997).

Theoretically, the strategies and aims of the values components of ACT are in line with those of values clarification and goal-setting strategies examined in various areas of the psychology and occupational literatures. For example, personal values clarification has been viewed as a significant factor within theories of motivation (e.g., expectancy-value theory; Atkinson, 1964), including work-related motivation and attitudes (e.g., Latham & Pinder, 2005). Related to these literatures, goals have been an integral construct within theories of self-regulation (e.g., Baumeister, Heatherton, & Tice, 1994;

Martin & Tesser, 1996) and behavioral task performance and commitment (e.g., Goal-Setting Theory; Lock & Latham, 1990; Value-Affirmation; Lydon & Zanna, 1990).

Moreover, consistent with the transactional theory of stress, values have been found to impact appraisals of meaning of stressful situations (e.g., Cooke & Rousseau, 1983), including work-related stress (e.g., Bocchino, Hartman, & Foley, 2003; Britt, Stetz, & Bliese, 2004; Carlson & Kaemar, 2000). Giving attention to personal values has also been shown to dampen the physiological reactions to stress (e.g., Creswell et al., 2005) and affect the coping strategies used to deal with stressful situations (e.g., Kelly & Stone, 1987; Post & Weddington, 1997). Personal values have also been linked to various work-related outcomes, such as satisfaction, commitment, and motivation (e.g., Butler, 1983; Jans, 1989; Knoop, 1994; Latham & Pinder, 2005; Robey, 1974), as well as engagement in healthy and unhealthy behaviors (Kristiansen, 1986; Oxford et al., 2002). Although values appear to be related to several work-related variables and have positive effects on strain and coping behaviors, the extent and mechanisms of these effects is not clear. More importantly, how the values component of ACT relates to such diverse literatures has not been empirically examined and no clear hypotheses regarding its individual effect on the outcomes of ACT can be made.

Overview and Statement of Purpose

The current study aimed to investigate the effects of dismantling the Acceptance and Commitment Therapy (ACT) protocol to ascertain the effects of ACT-based mindfulness and to examine whether and how ACT's values components significantly add to its effects beyond those of the mindfulness components. Although research examining certain specific strategies within ACT exists, its coverage is limited and no

study has attempted to dismantle ACT. Previous research has suggested that outcomes in applications of ACT for various types of physical and psychological distress (Hayes et al., 2006) and for workplace stress (Bond & Bunce, 2000; Flaxman & Bond, in preparation) are mediated by level of psychological acceptance, the opposite of which is experiential avoidance. Such acceptance could be conceptualized as representing the result of the first four of ACT's six intervention components. These processes have been referred to in whole as a behavioral definition of mindfulness (Fletcher & Hayes, in press), a construct defined in large part by psychological acceptance. Given this research and the theoretical underpinnings of ACT, the contribution of the values components of ACT to observed outcomes has yet to be elucidated.

How the effects of an intervention come about represents an important area for further investigation. Therefore, in addition to primary outcome measure, differences between the full and the abbreviated versions of the ACT intervention on variables hypothesized to be possible mediators (i.e., mechanisms) of change were also examined. These process variables included not only psychological acceptance, but also other mindfulness factors recently identified, variables related to how participants' relate to their cognitions and affect, work locus of control, and extent of skills practice outside of sessions.

The ACT protocol dismantled in the present study was based on the intervention for stress management at work originally developed by Bond and colleagues (Bond & Bunce, 2000; Flaxman & Bond, in preparation). An intervention duration shorter than the original 14 weeks that comprises Bond et al.'s 2+1 method of delivery was utilized. Establishing the effectiveness of a shorter program has significant logistical and cost

implications for organizations. Also, limitations of the extant studies of ACT for workplace stress (i.e., lack of stress and coping assessment, limited measures of outcome and potential mediating variables) were addressed.

A dismantling experimental research strategy, in which the full version of ACT, composed on two components (i.e., mindfulness & values), was compared with a reduced version which omits the values component, was utilized. In such a design, the effect of the full program reflects the main effect of each component taken separately plus the interaction among the components. The effect of the reduced version of the program reflects only the main effect of the component that is present, namely mindfulness. To the extent that the reduced version of the program produces outcomes that do not differ from the comprehensive program, it may be concluded that the addition of the omitted component does not appreciably add to the effectiveness of the comprehensive program over and above that of the reduced version (West & Aiken, 1997).

Research Hypotheses

The present study tested the following hypotheses:

1. Participants in the full ACT group (“ACT”) and participants in the abbreviated ACT group (“AT”) were expected to experience significant improvements from pre-treatment to post-treatment on all outcome and process measures, except for those assessing frequency of life and job stressors, which are not under the control of the individual unless significant changes in lifestyle or work environment occur.
2. The improvements pre- to post-treatment in AT and ACT would be equivalent on all measures. However, participants in the ACT group were expected to report: a) greater improvement in the Action subscale of the AAQ, b) greater use of active coping and less

use of avoidance coping, c) higher overall value-to-action congruence in coping, and d) higher levels of job satisfaction, meaning, motivation, and importance, due to the proposed influence of values clarification on these variables.

3. At each follow-up assessment, improvements in measures seen pre- to post-treatment were expected to be maintained for participants in AT, but to increase further for participants in ACT, due to the proposed influence of values clarification on motivation and maintaining commitment to therapy skills.

4. Furthermore, it was proposed that for both the ACT and the AT group, improvements in outcome measures would be mediated by improvements in process measures. These associations were expected to remain significant even when mediation by negative affectivity and work locus of control was controlled for.

5. It was also proposed that the predicted associations between the improved outcome measures and the Action subscale of psychological flexibility, use of approach coping, use of avoidance coping, approach coping values-to-behavior congruence, and avoidance coping values-to-behavior congruence would be greater for the ACT than for the AT group.

6. Participants in the ACT group were expected to report greater post-program engagement in the practice of the mindfulness intervention skills than participants in AT, due to the theorized effects of values clarification on behavioral commitment.

7. Lastly, based on previous research, it is hypothesized that for both the ACT and the AT group, any improvement in job satisfaction would be mediated by pre-treatment levels of work control, negative affectivity, and work locus of control.

Chapter 2

METHOD

Participant Recruitment

Participant recruitment targeted employees of four large employers and the general Orono/Bangor, Maine, community. Three of the employer sites were in Maine and initially included the University of Maine (UM) and Husson College, and Eastern Maine Medical Center (EMMC). After limited participant enrollment occurred from efforts at these sites, the University of Florida and its affiliated hospital Shands Healthcare (UF/Shands), in Gainesville, Florida, were added as a fourth recruitment site. Recruitment at these sites was conducted via flyers hung in common campus areas and buildings and an emailed announcement posted within departmental, administrative, and employee-specific online conferences and folders. Flyers were placed in the community as well.

In addition, recruitment was also conducted at UM via a print and online employee newsletter, online university-wide news release, and a general press release. At UF/Shands, recruitment was also conducted via print and online versions of hospital- and university-wide newsletters, print and online versions of the university employee-specific magazine, direct emailed contact with department chairs and center directors, a university-wide newspaper, and a month-long run of an announcement on local public radio.

Other than an age minimum of 18 years, no exclusionary criteria for enrollment were used. Current literature suggests that ACT can be beneficial for employees with

“normal” levels of mental health, as well as for those who are experiencing moderate to high levels of psychological distress (Flaxman & Bond, 2006). Although initially not specifically targeted, funded graduate students at UM and Husson were directly recruited in an attempt to increase enrollment.

Interventions

A treatment manual was developed for both intervention versions. Each version is highly structured in format and content. The programs were not identified to the participants as “Acceptance and Commitment Therapy” or ACT, nor were these terms used within the program. This was done, primarily, in order to avoid having participants in the abbreviated program learn about the omitted components should they by chance have prior knowledge of ACT or investigate it by name (e.g., on the internet) while in the study. The program, in both versions, was instead referred to as “Working with Stress”. The consent indicated that both programs included content related to how individuals think about and experience things that cause them stress and what kinds of things they do in reaction to these stressors. This goal was also restated during the first session of each program version.

Acceptance and Commitment Therapy (ACT)

The ACT-based protocol for stress management, originally developed and validated by Bond and colleagues (Bond, 2004; Bond & Hayes, 2002; Flaxman & Bond, 2006), served as the basis for the full ACT group program, termed “Working with Stress-Program A” in study materials, and was supplemented with material from the original ACT protocol (Hayes et al., 1999). All six components of ACT were administered in the full version of the intervention. Although the meeting duration, timeline, and number of sessions

differed between the study manual and the manual of Bond and colleagues, the total time of group-therapist contact remained the same (i.e., 10 hours). Participants met once a week for six weeks for two hours at a time, allowing for each of the six components to be administered for approximately 1.5 hours.

Acceptance Therapy (AT)

The abbreviated version of the program, termed “Working with Stress-Program B” in study materials, consisted of the first four components of the full ACT protocol (i.e., the mindfulness aspects) and omitted the last two components (i.e., the values components). The manualized content of AT was identical to the content used for the first four components of ACT. Participants met once a week for four weeks for two hours, allowing for each of the four components to be administered for approximately 1.5 hours.

Both interventions were administered in group format. The principal investigator, an advanced graduate student trained and experienced in CBT (e.g., including progressive relaxation training) and ACT techniques conducted the majority of the research (e.g., responding to recruitment inquiries, administering the interventions, data collection). The investigator also has experience administering the psychotherapy version of ACT with various individual clients and has participated in a 1-day experiential ACT training workshop focusing on ACT for anxiety disorders. In addition, she has participated in numerous professional trainings and workshops on mindfulness approaches, has developed and administered an experimental mindfulness-based group intervention for self-regulation of eating, and has been a regular practitioner of mindfulness meditation for half a decade. A second intervention facilitator was an

advanced clinical graduate student, who participated in the third of three series of groups administered at UM. The administration of the interventions was supervised by licensed psychologist, Dr. Sandra Sigmon. Dr. Sigmon is an experienced CBT and ACT clinician and researcher in the field of health psychology.

Procedure

Individuals who consented to participate in the study and completed pre-treatment measures were assigned to one of the two treatment conditions. Assignment was made randomly to the extent possible while giving consideration to participants' availability to attend particular days of the week and times of the day. In total, 3 series of the intervention were run, with each series consisting of a group for each program version. Each session of each of the two programs was audio recorded for manual adherence evaluations by two undergraduate research assistants at UM blind to the program condition.

Self-report questionnaires were used to assess demographic information, outcome variables, and group process variables. All questionnaires responses were anonymous with each participant assigned a unique identification number. Participants completed a packet of measures before the initial intervention session (Pre-treatment), after the last intervention session (Post-treatment), and at 3 follow-up assessments. A complete listing and description of the outcome and process measures in the packet is given below. Participants completing paper packets were provided with pretreatment packets at the time of the consent procedures, at post-treatment, and copies for the 3 follow-up sessions were given at the last treatment session. Participants returned the packets via campus mail. Participants who chose to answer the questionnaires online were emailed

instructions to access SurveyMonkey and their ID number following consent procedures. Each participant received a reminder email a week before the first session and a week after the last session to complete their questionnaires.

To test the durability of the interventions' effects, follow-up assessments of the outcome and process measures occurred at 1 month, 3 months, and 6 months following the last (i.e., fifth) intervention session. Each participant received an email a week before each follow-up time-point reminding them to complete their set of measures. The six-month criterion for follow-up is frequently suggested as the adequate period necessary to ascertain minimum long-term treatment effectiveness (Glasgow & Rosen, 1978; Kazdin & Wilson, 1978).

Measures

Participant Characteristics

Demographic Questionnaire. A demographic questionnaire was included as part of the pre-treatment packet and used to assess age, gender, ethnicity, marital status, education level, income range, and occupation.

Work Control. The Work Control Scale (WCS; Dwyer & Ganster, 1991) is a 22-item measure assessing a range of areas over which individuals can have control at work: variety of tasks performed, the order of task performance, pacing, scheduling of rest breaks, procedures and policies in the workplace, and arrangement of the physical environment. This measure was used to control for the degree of job control experienced by participants in the present study. Each item (e.g., "*How much control do you have personally over the quality of your work?*") is rated on a 5-point Likert scale ranging from (1) "*very little*" to (5) "*very much*". Higher scores indicate greater levels of control.

Psychometric properties of this scale appear adequate and reveal a single factor of control (Ganster, 1989). In Bond & Bunce (2003), alpha coefficients for this scale were .88 and .90 for Times 1 and 2, respectively. Alpha coefficient for the present study was 0.91 at pre-treatment.

Outcome Measures

Job Stress Survey. The Job Stress Survey (JSS; Vagg & Spielberger 1998) is a 30-item instrument based on a transactional approach to stress and designed to assess the perceived intensity (i.e., severity) and frequency of occurrence of work characteristics that may adversely affect the psychological well-being of workers. The JSS permits assessment of 30 generic job stressors (e.g., “excessive paperwork”, “poorly motivated coworkers”) that are encountered in a variety of work settings and across gender and occupational level (Vagg & Spielberger, 1999). For the present study, respondents were asked to first indicate how frequently each experience was a part of their life over the past month on a 5-point Likert scale, ranging from (0) “*Not at all*” to (4) “*Very frequently*”, and then to indicate the level of negative impact or stress that each experience had on their well-being on a 5-point Likert scale, ranging from (0) “*None*” to (4) “*Very High*”. Summing the ratings across all 30 items yielded an Overall Frequency (JSS-F) score and an Overall Impact (JSS-I) score. An Overall Job Stress Index (JSS-X) was then calculated by summing the cross-products of the frequency and impact scores.

Using a similar scoring scheme, Spielberger and Vagg (1999) reported a reliability coefficient of .87 for the Overall Job Stress score. Moreover, several studies have verified the construct validity of the JSS (e.g., Spielberger & Reheiser, 1994; Turnage & Spielberger, 1991). Alpha coefficients for the present study were .87, .88, .93,

.87, and .89 for JSS-F and .87, .87, .95, .92, and .94 for JSS-I at each of the assessment times (pre-treatment, post-treatment, first follow-up, second follow-up, and third follow-up, respectively).

Survey of Recent Life Events. The Survey of Recent Life Events (SRLE; Kohn & Macdonald, 1992) is a 51-item measure formulated to assess exposure to a variety of daily hassles. This measure was developed as an alternative to earlier measures (e.g., Daily Hassles Scale (DHS); Kanner, Coyne, Schaefer, & Lazarus, 1981), which were criticized for being contaminated by items and a response format that may reflect subjective distress rather than predict it (Green, 1986; Kohn & Macdonald, 1992). The SRLE has been found to demonstrate high internal consistency ($\alpha = .91$). In addition, the measure has been shown to correlate significantly with perceived stress, trait anxiety, psychiatric symptomatology, and minor physical ailments (e.g., Kohn, Gurevich, Pickering, & Macdonald, 1994).

The SRLE utilizes a Likert scale format for respondents to indicate the extent to which an item was part of his or her life during the past month ($1 = \textit{not at all}$, $4 = \textit{very much}$). The sum of responses is calculated, with higher scores indicating a greater experience of daily hassles over the past month. In addition to the assessment of extent of occurrence for each item, participants in the present study were asked to also rate each item on the level of negative impact or stress it had when it did occur, using a 5-point Likert scale, ranging from (0) "*None*" to (4) "*Very high*". Thus, similar to the scoring scheme of the JSS, a Life Stressor Frequency score (SRLE-F), a Life Stressor Impact score (SRLE-I), and an Overall Life Stressor Index computed from their cross products (SRLE-X) were ascertained. Alpha coefficients for the present study were .90, .93, .93,

.94, and .96 for SRLE-F and .94, .93, .89, .91, and .97 for SRLE-I at each of the assessment times, respectively.

Beck Depression Inventory-II. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report inventory designed to assess cognitive, affective, and somatic symptoms commonly reported in depression. Respondents are asked to indicate the severity of their depressive symptoms “for the past week” on a “0” (i.e., neutral severity) to “3” (i.e., maximum severity) scale and scores are added to give a total ranging from 0 to 63. The BDI-II has demonstrated adequate internal consistency, short-term test-retest reliability, and convergent validity (Beck et al., 1996). The BDI-II is often used in research on mood disorders and has been utilized in previous investigations of ACT for stress, with adequate psychometric characteristics (see Hayes et al., 2006 for a review of ACT studies utilizing the BDI). Alpha coefficients for the BDI-II in the present study were .78, .89, .87, .84, and .90 at each of the assessment times, respectively.

The State-Trait Anxiety Inventory. The State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Luschene, Vagg, & Jacobs, 1982) is a 40-item self-report measure assessing “state” and “trait” anxiety. “State” anxiety refers to an individual’s level of anxiety at the time of assessment and is assessed by having individuals rate 20 items of the STAI on how they currently feel on a 0 (“*not at all*”) to 4 (“*very much so*”) scale. Trait anxiety refers to an individual’s general level of anxiety and is assessed by having individuals rate the other 20 items of the STAI on how they generally feel on a 0 (almost never) to 4 (almost always) scale. As would be expected, test-retest reliability values for the state anxiety scale and the strait anxiety scale range from .16 to .54 and from .73 to

.86, respectively (Spielberger et al., 1982). Both versions have been used extensively in clinical and occupational psychology research. Alpha coefficients for the STAI-S in the present study were .88, .95, .96, .86, and .96 at each of the assessment times, respectively. Alpha coefficients for the STAI-T in the present study were .86, .91, .81, .87, and .94 at each of the assessment times, respectively.

General Health Questionnaire-12. The General Health Questionnaire (GHQ; Goldberg, 1972) is a 12-item scale that is widely used for measuring general distress (McDowell & Newell, 1996). Respondents are asked to indicate to what extent they have recently (i.e., “over the past few weeks”) experienced the medical complaints listed, using a 4-point Likert scoring system, ranging from “not at all” (0) to “much more than usual” (3). Items include: “. . . *felt constantly under strain?*”, “. . . *lost sleep over worry*”, and “. . . *loosing confidence in yourself?*” Higher scores indicate poorer general mental and physical health. Alpha coefficients for the GHQ-12 range from .82 to .90 in one review (Vieweg & Hedlund, 1983), whereas in Bond and Bunce (2000), Cronbach alphas were .73, .75, .76, and .75 from T1 to T4, respectively. Alpha coefficients for the GHQ in the present study were .82, .91, .87, .72, and .72 at each of the assessment times, respectively.

The Short-Form-36 Health Survey. The 36-item short form of the Medical Outcomes Study questionnaire (SF-36; Ware & Sherbourne, 1992) was designed as a generic indicator of health status for use in population surveys, health policy evaluations, and as an outcome measure in clinical practice and research. The measure includes multi-item scales to measure the following eight dimensions: physical functioning, role limitations due to physical problems, bodily pain, social functioning, general mental

health, role limitations due to emotional problems, vitality, energy, and fatigue, and general health perceptions. The SF-36 has demonstrated reliability and validity in a variety of disease groups, as well as in the general population. It has also proven to be useful in estimating the relative health burden of different conditions, including mental disorders, and in assessing the impact of associated treatments (Garratt, Ruta, Abdalla, Buckingham, & Russell, 1993; Nerenz, Repasky, Whitehouse, & Kahkonen, 1992).

Due to the large number of items in the SF-36 and variables within the study overall, it was decided that only selected items of the SF-36 seen as most informative for the study aims were included in analyses. These included item 1 (SF-1, a Likert-scale item assessing general physical health, with higher scores indicative of poorer health), item 5c (SF-5c, a “yes” or “no” item assessing whether emotional problems have caused the individual to accomplish less than they would like in their work or other regular activity), and item 6 (SF-6, a Likert-scale item assessing the extent to which physical health or emotional problems interfered with the individual’s normal social activities, with higher scores indicative of greater interference).

Quality of Life-Inventory. The Quality of Life-Inventory (QOLI; Frisch, 1988, as cited in Frisch, Cornell, Villanueva, & Retzlaff, 1992) assesses overall life satisfaction based on weighted scores in 17 domains or areas of life. Each area is rated by respondents in terms of its importance to their overall happiness and satisfaction, using a 3-point scale (0 = not at all important, 1 = important, 2 = extremely important), and in terms of their satisfaction with the area, on a 7-point scale (-3 = very dissatisfied to 3 = very satisfied). The product of the importance and satisfaction ratings for each area yield weighted satisfaction ratings, ranging from -6 to 6. An overall satisfaction score was then

obtained by summing the weighted ratings for a total score. The overall QOL score (QOL), as well as the work-domain QOL (item 5) was examined (QOL-W). The QOLI has been found to be psychometrically sound (Frisch, Cornell, Villanueva, & Retzlaff, 1992). Alpha coefficients for the weighted satisfaction items of the overall QOL in the present study were .91, .90, .88, .89, and .92 at each of the assessment times, respectively.

Job Satisfaction Scale. The Intrinsic Job Satisfaction Scale is a 16-item measure found within the Work and Life Attitudes Survey (Warr, Cook, & Wall, 1979), reflective of the appraisals workers make of their jobs and of work. The scale explores the degree of satisfaction that workers derive directly from their work. The items include "*the recognition you get for good work*" and "*your rate of pay*". Responses are recorded on a 7-point Likert scale from (1) "*extremely dissatisfied*" to (7) "*extremely satisfied*". Test-retest correlation coefficient for this scale was found to be .63 by the authors (Warr et al., 1979). Bond and Bunce (2000) found Cronbach alpha coefficients for this measure from T1 to T4 to be .79, .82, .80, and .79, respectively. Alpha coefficients for the JSAT in the present study were .89, .91, .94, .88, and .94 at each of the assessment times, respectively.

Intrinsic Job Motivation Scale. This scale is one of the scales from the Work and Life Attitudes Survey (Warr, Cook, & Wall, 1979). It is a six-item scale measuring respondents' wishes to work to the best of their ability (e.g., "I take pride in doing my job as well as I can"). Each item is anchored to a 7-point Likert scale ranging from (1) *strongly disagree* to (7) *strongly agree*. In the study by Bond and Bunce (2000), Cronbach alphas for this measure from T1 to T4 were .72, .74, .78, and .75, respectively (Warr et al., 1979). Alpha coefficients for the Intrinsic Job Motivation Scale (IJM) in the present study were .82, .71, .65, .91, and .72 at each of the assessment times, respectively.

Work Involvement Scale. This is another scale from the Work and Life Attitudes Survey (Warr, Cook, & Wall, 1979). This scale is a six item measure of meaning placed on work in general (e.g., “*Having a job is very important to me*”). Participants asked to indicate the extent to which they agree or disagree with each statement on a 7-point Likert scale ranging from (1) *strongly disagree* to (7) *strongly agree*. Alpha coefficients for the Work Involvement Scale (WIS) in the present study were .69, .69, .65, .87, and .91 at each of the assessment times, respectively.

Higher Order Need Strength Scale. This is a third scale from the Work and Life Attitudes Survey (Warr, Cook, & Wall, 1979). This scale is a six-item scale measuring the level of importance a respondent places on a variety of job characteristics. Example items include “*Achieving something that you personally value*” and “*Challenging work*”. A 7-point Likert scale, ranging from (1) *Not at all important* to (7) *Extremely important*. Test-retest correlation coefficient for the scale was .26 (Warr et al., 1979). The authors acknowledge that the observed test-retest reliability of the HONS is undesirably low and note that this concept has presented problems of operationalization to other investigators, with scope for further improvement. Alpha coefficients for the HONS in the present study were .89, .74, .84, .82, and .93 at each of the assessment times, respectively.

Process Measures

Work Locus of Control Scale. The 16-item Work Locus of Control Scale (Spector, 1988) assesses the extent to which people expect that rewards, reinforcements, and other outcomes in the work domain are controlled either by one’s own actions or by others. Responses to each of the 16 items (e.g., “Promotions are usually a matter of good fortune”) are scored on a 6-point scale ranging from 1 (*disagree very much*) to 6 (*agree*

very much). The questionnaire was scored so that higher scores indicate a greater internal locus of control. Research indicates that this measure predicts work outcomes (e.g., job satisfaction) better than Rotter's (1966) general locus of control scale (Spector, 1988). Bond and Bunce (2003) found alpha coefficients at Times 1 and 2 of .73 and .77, respectively. Alpha coefficients for the WLoC in the present study were .83, .84, .87, .83, and .86 at each of the assessment times, respectively.

Positive and Negative Affect Scale. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) lists 10 adjectives that describe negative moods (e.g., distressed, guilty, hostile, irritable, and nervous) and 10 that describe positive moods (e.g., interested, strong, enthusiastic, and inspired). Participants indicate the extent to which they generally feel or have felt each mood on a 5-point scale ranging from (1) "*not at all*" to (5) "*extremely*". For the present study, the time period was the "past few weeks". Higher scores indicate greater levels of negative and positive affectivity. Watson et al. (1988) found that this measure demonstrates good psychometric properties. In the study by Bond and Bunce (2003), Times 1 and 2 alpha coefficients for the Negative Affect Scale were .87 and .89, respectively. Alpha coefficients for the Negative Affect Scale in the present study were .87, .89, .85, .85, and .85 at each of the assessment times, respectively. Alpha coefficients for the Positive Affect Scale in the present study were .94, .96, .93, .79, and .94 at each of the assessment times, respectively.

Acceptance and Action Questionnaire. The 19-item AAQ was utilized in this study and scoring was based on the 16 items that make up the Acceptance and Action Questionnaire-16 (AAQ-16; Hayes et al., 2002). This scale assesses people's willingness to accept their undesirable thoughts and feelings while acting in a way that is congruent

with their values and goals. Items on the 16-item AAQ tap various domains, including cognitive defusion (e.g., “*When I evaluate something negatively, I usually recognize that this is just a reaction, not an objective fact*”), negative evaluations of internal experiences (e.g., “*Anxiety is bad*”), negative self-evaluation (e.g., “*When I compare myself to other people, it seems that most of them are handling their lives better than I do*”), inability to take action due to the influence of thoughts and feelings (e.g., “*I am unable to take action on a problem if I am uncertain what is the right thing to do*”), and the need for control over one’s thoughts and feelings (e.g., “*I worry about getting my anxieties, worries, and feelings under control*”). A 7-point Likert scale, ranging from 1 (*never true*) to 7 (*always true*), is used to rate responses. The AAQ has been keyed both positively and negatively in the literature, depending on whether the focus was on experiential avoidance or acceptance/psychological flexibility (Hayes et al., 2006). In the present investigation, the questionnaire was scored in such a manner so that higher scores indicate greater psychological flexibility.

Research thus far indicates that the 16-item AAQ has adequate internal consistency, criterion-related, predictive, and convergent validities (Bond & Bunce, 2003; Hayes et al., 2004). Regarding convergent validity, Hayes et al. (2004) found in two studies that the AAQ was significantly and negatively associated with the White Bear Suppression Inventory, a measure of individual’s tendency to suppress (i.e., not accept) unwanted thoughts (WBSI; Wegner & Zanakos, 1994). In addition, Donaldson-Feilder and Bond (2004) found that the AAQ was significantly and positively associated with the Clarity Scale of the Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman,

Turvey, & Palfai, 1995). The TMMS scale assesses the degree to which people allow themselves to experience, and hence not avoid, both desirable and undesirable feelings.

Tests of construct validity have demonstrated that the 16 items of the AAQ load onto two continuous factors: “willingness to experience internal events” (Willingness subscale, AAQ-W), tapping acceptance and mindfulness concepts, and “ability to take action, even in the face of unwanted internal events” (Action subscale, AAQ-A), assessing values-based action (Bond & Bunce, 2003). Both of these scales load on a second-order factor termed psychological flexibility (Bond & Bunce, 2003; Hayes et al., 2006). In Bond and Bunce (2000), Cronbach alphas for the AAQ total score from T1 to T4 of .89, .91, .92, and .90, respectively, were obtained. In Bond & Bunce (2003), Times 1 and 2 alpha coefficients for this measure were .79 and .72, respectively. For the present study, both the Willingness subscale and the Action subscale, along with the total AAQ scale were utilized. Alpha coefficients for the AAQ total in the present study were .79, .79, .74, .72, and .72 at each of the assessment times, respectively. Alpha coefficients for the AAQ-W subscale in the present study were .70, .75, .65, .72, and .69 at each of the assessment times, respectively. Alpha coefficients for the AAQ-A subscale in the present study were .72, .65, .66, .68, and .76 at each of the assessment times, respectively.

The Five Facet Mindfulness Questionnaire. The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) is a 39-item measure of mindfulness derived from a combined pool of items from existing mindfulness questionnaires and is currently the only one that assesses all five facets of mindfulness. These facets correspond to the five factors of the FFMQ, derived via exploratory and then confirmatory factor analyses, and include the following: 1)

Nonreactivity to inner experience ($\alpha = .75$; e.g., “*I perceive my feelings and emotions without having to react to them*”), 2) Observing ($\alpha = .83$; “*I pay attention to sensations, such as the wind in my hair or sun on my face*”), 3) Acting with awareness ($\alpha = .87$; “*I find myself doing things without paying attention*”), 4) Describing ($\alpha = .91$; “*I’m good at finding the words to describe my feelings*”), and 5) Nonjudging of experience ($\alpha = .87$; “*I think some of my emotions are bad or inappropriate and I shouldn’t feel them*”).

Respondents are asked to rate each item in the questionnaire, using a 5-point Likert-type scale ranging from (1) “*never or very rarely true*” to (5) “*very often or always true*”.

Convergent and discriminate validity analyses indicated expected relationships between each factor scale and various related constructs (Baer et al., 2006).

In the present study, alpha coefficients for the FFMQ were .86, .92, .93, .88, and .92 at each of the assessment times, respectively. Alpha coefficients for each of the subscales at T1 through T5 were .66, .81, .85, .85, and .76 for Nonreactivity (FFMQ-NR), .86, .89, .90, .87, and .90 for Observing (FFMQ-O), .89, .85, .83, .87, and .96 for Acting with Awareness (FFMQ-A), .87, .85, .84, .87, and .91 for Describing (FFMQ-D), and .87, .83, .90, .91, and .87 for Nonjudging (FFMQ-NJ).

Automatic Thoughts Questionnaire. The Automatic Thoughts Questionnaire (ATQ-N; Hollon & Kendall, 1980) is a 30-item questionnaire designed to assess the frequency of automatic negative thoughts often associated with depression. Example items include “*I’m worthless*”, “*Wish I could just disappear*”, “*What’s the matter with me?*”, “*I’m a loser*”, and “*My life is a mess*”. Respondents are asked to rate the frequency with which these self-statements occurred over the period of the past week, using a 5-point Likert scale, ranging from (1) *never* to (5) *all the time*. In addition to this

assessment of frequency (ATQ-NF), respondents may also be asked to rate the degree to which they believed each item when it occurred, using a 5-point Likert scale, ranging from (0) “*Not at all*” to (4) “*Very much*”. This believability scale, termed the ATQ-NB, was used as a measure of cognitive defusion within a previous investigation of ACT (Zettle & Hayes, 1986) and was utilized in the present study.

Previous research indicates acceptable reliability and validity of the ATQ (Hollon & Kendall, 1980). Subsequent investigations have given additional positive support regarding the measure’s psychometric properties, with alpha coefficients ranging above .80 and hypothesized relationships with other related measures found to be as expected (e.g., Dobson & Breiter, 1983; Harrell & Ryon, 1983). Moreover, the ATQ has also proven valuable as a sensitive measure of the cognitive change associated with cognitive-behavioral clinical interventions (e.g., Bisno, Thompson, Breckenridge, & Gallagher, 1985; Simons, Garfield, & Murphy, 1984). In the present study, alpha coefficients for the frequency of negative automatic thoughts (ATQ-NF) were .96, .97, .97, .95, and .96 at each of the assessment times, respectively. Alpha coefficients for the believability of negative automatic thoughts (ATQ-NB) were .90, .99, .94, .92, and .96 at each of the assessment times, respectively.

Automatic Thoughts Questionnaire-Positive. The Automatic Thoughts Questionnaire-Positive (ATQ-P; Ingram & Wisnicki, 1988) is a 30-item inventory similar in format to the ATQ that was designed to assess the occurrence of positive automatic cognition. Example items include “*I am a lucky person*”, “*I am respected by my peers*”, “*I’m fun to be with*”, “*I deserve the best in life*”, and “*I have many useful qualities*”. Similar to the ATQ, respondents are asked to rate the frequency with which these self-

statements occurred over the period of the past week, using a 5-point Likert scale, ranging from (1) *never* to (5) *all the time*. To parallel the believability rating scale that will accompany the ATQ, a similar believability scale for the ATQ-P was utilized for the current study (i.e., the ATQ-PB) by having participants rate the believability of each ATQ-P statement along with rating its frequency.

The ATQ-P has shown high internal consistency in its initial development study (coefficient alpha of .94) and in subsequent investigations (alphas all above .80; e.g., Burgess & Haaga, 1994; Ingram, Johnson, Bernet, Dombeck, & Rowe, 1992). The validity of the ATQ-P has also been found to be adequate. Specifically, the ATQ-P inversely and moderately correlates with measures of depressive and anxiety symptoms (Burgess & Haaga, 1994; Ingram & Wisnicki, 1988). In addition, findings indicating that the measure adequately discriminates clinically and subclinically depressed or anxious individuals from nondistressed individuals, and that ATQ-P scores are specific to psychological distress rather than distress stemming from physical conditions not accompanied by psychological distress (for a review, see Ingram, Kendall, Siegle, Guarino, & McLaughlin, 1995). In the present study, alpha coefficients for the frequency of positive automatic thoughts (ATQ-PF) were .97, .96, .97, .96, and .98 at each of the assessment times, respectively. Alpha coefficients for the believability of positive automatic thoughts (ATQ-PB) were .97, .96, .96, .94, and .98 at each of the assessment times, respectively.

Valued Coping in Action Questionnaire. The Valued Coping in Action Questionnaire (VCAQ) is a measure specifically designed for the present investigation as a way to assess values-based action, as described within ACT (e.g., Hayes et al., 1999).

It utilizes the items of the COPE, a measure of 60-items designed to identify adaptive and problematic coping reactions (Carver, Scheier, & Weintraub, 1989). It is comprised of 15 subscales of four items each: 1) Active coping ($\alpha = .62$; e.g., *"I concentrate my efforts on doing something about it."*); 2) Planning ($\alpha = .80$; *"I try to come up with a strategy about what to do."*); 3) Suppression of competing activities ($\alpha = .68$; e.g., *"I put aside other activities in order to concentrate on this."*); 4) Restraint coping ($\alpha = .72$; *"I force myself to wait for the right time to do something."*); 5) Seeking social support for instrumental reasons ($\alpha = .75$; *"I ask people who have had similar experiences what they did."*); 6) Seeking social support for emotional reasons ($\alpha = .85$; *"I talk to someone about how I feel"*); 7) Positive reinterpretation and growth ($\alpha = .68$; *"I look for something good in what is happening."*); 8) Acceptance ($\alpha = .65$; *"I learn to live with it."*); 9) Turning to religion ($\alpha = .92$; *"I seek God's help."*); 10) Focusing on and venting of emotions ($\alpha = .77$; *"I get upset and let my emotion out."*); 11) Denial ($\alpha = .71$; *"I refuse to believe that it has happened."*); 12) Behavioral disengagement ($\alpha = .63$; *"I give up the attempt to get what I want"*); 13) Mental disengagement ($\alpha = .45$; *"I go to movies or watch TV, to think about it less."*); 14) Alcohol-drug disengagement (i.e., *"I drink alcohol or take drugs, in order to think about it less."*); 15) Humor (i.e., *"I made jokes about the situation"*). The COPE subscales have demonstrated acceptable internal consistency, with only one subscale having an alpha coefficient below .60. This exception was the mental disengagement scale and is not unexpected, given that it differs from the others in being more of a multiple-act criterion (Carver et al., 1989). The COPE has also demonstrated adequate convergent and discriminant validity (Carver et al., 1989).

Using the items of the COPE, the VCAQ entails a Values version and an Action version. The Values version (VCAQ-V; see Appendix A) asked participants to indicate the extent they find each coping response to stress as a good thing, as something to strive for in their own behavior. The Action version (VCAQ-A; see Appendix A) asked participants to indicate the extent they generally engaged in each coping response in response to difficult or stressful situations at work in the past few weeks and items were worded in the active first person. To prevent participants from easily referring between the scales should they have wanted to align their responses in some particular manner, the items in the Values version of the VCAQ were presented in a different order than those of the Action version.

Congruence was ascertained by calculating the absolute difference between the corresponding Value and Action items, with lower values indicative of greater congruence between valuing and utilizing a certain coping strategy and higher values indicative of lower congruence between valuing and utilizing a certain coping strategy. A total congruence score (VCAQ-VA) was calculated by summing the 15 individual congruence values. Alpha coefficients for this congruence scale were .67, .81, .76, .76, and .67 at each of the assessment times, respectively.

Rather than examine changes in each of the many subscales, the present study focused on two newly devised subscales. These novel scales aimed to focus on responses that were thought to be most closely aligned with the ACT approach, in that they measured active or approach-type strategies versus disengaged or avoidance-type strategies. Specifically, the Active Coping and Positive Interpretation/Growth subscales were summed to create a novel scale, termed Approach Coping, based on the content of

the items within each subscale, the extent of association between the subscales and findings that these two subscales have been found to correlate positively with measures of optimism, internal locus of control, self-esteem, and stress hardiness (Carver et al., 1989). The second novel scale was termed Avoidance Coping and represented the total of the Denial and Behavioral Disengagement subscales, which also correlated to a significant and large extent and have been found to associate negatively with measures of optimism, internal locus of control, self-esteem, and stress hardiness (Carver et al., 1989).

A Values and an Action version of each subscale was devised. Alpha coefficients at T1 through T5 were .67, .66, .64, .76, and .63 for the Values version of the Approach Coping subscale (ApprochC-V), .90, .89, .87, .86, and .82 for the Action version of the Approach Coping subscale (ApprochC-A), .73, .77, .76, .84, and .66 for the Value version of the Avoid Coping subscale (AvoidC-V), and .68, .68, .68, .64, and .85 for the Action version of the Avoid Coping subscale (AvoidC-A).

Therapy Process Measures

Expectations for Treatment. As part of the pre-treatment assessment, participants were asked about their expectations for treatment. Specifically, they were asked to indicate, using a 7-item Likert scale ranging from (1) “not at all” to (4) “some” to (7) “a great deal”, 1) the extent they expected that this program would 1) help reduce the distress they experience from work-related stressors, 2) help reduce the distress they experience from stressors outside of work, 3) help them experience more satisfaction or fulfillment in their work, and 4) help them experience more satisfaction or fulfillment in their life. At the post-treatment assessment, participants responded to the same four items, with wording of the items being in the past tense (i.e., “To what extent did this

program help...”). As an additional measure of program effects, at each follow-up participants again responded to these four items. However, wording of this measure at the follow-up assessments asked the extent of change participants experienced in each domain, and thus their responses do not necessarily reflect any effect attributable to the treatment.

Group Cohesiveness. At post-treatment, participants completed the Schutz (1966) Cohesiveness Questionnaire, as modified for therapy groups by Lieberman, Yalom, & Miles (Feelings About the Group; 1973), is a 12-item, Likert-type scale designed to measure the attractiveness of a group for its members and the degree of perceived belongingness or acceptance by other members in the group. Participants were asked to respond on items asking about their participation in the group, liking of the group, inclusion in the group, and feelings about the facilitator. The version of the measure used in one study had a coefficient alpha of .82 (Lieberman et al., 1973). This measure is widely used to measure group cohesiveness and has been found to have adequate content validity (Johnson & Fortman, 1988) and internal consistency (e.g., coefficient alpha .80, Marmarosh, Holtz, & Schottenbauer, 2005).

For this study, item 9 from the Feelings About the Group scale, which asks how many members of their group would a participant exchange with other ideal group members, was omitted from analysis. Item 7 was used as an individual variable (MtgEval) and asked participants to rate on a 5-point Likert scale how often their group should have met compared to how often it did meet. Item 11 was also used as an individual variable (FacEval) and asked participants to rate how satisfied they were with the group facilitator on a 7-point Likert scale. The remaining 8 items of the scale (items

1-6, 8, and 10) were summed for an overall measure of participants' evaluation of group cohesiveness at the post-treatment assessment. The less than adequate coefficient alpha for this cohesiveness measure (.59) reflects the varied content of the items.

Skills Practice Monitoring. Participants' practice of activities assigned during administration of the intervention for completion in-between sessions was assessed via a questionnaire participants completed at each session following the first. A total of 7 mindfulness-related practices and 4 values-related practices were monitored. Due to the shorter duration of treatment, participants in the AT group reported on 5 of the 7 mindfulness practices, although each group was exposed to all exercises. Participants in AT were not exposed to and thus did not monitor practice of the values-based exercises. Participants were asked to indicate whether or not they practiced the exercise to any extent and then to rate, on a 1 to 5 scale, how beneficial the practice was in achieving its stated aim. For analysis, the median number of mindfulness exercises practiced session 1 to 4 for both intervention groups and the median number of values exercises practiced session 5 to 6 for the ACT group was calculated.

The five mindfulness practices participants in both interventions reported on included 1) Attending to thoughts, feelings, and reactions to stressful situations and how well those reactions work, with the aim of awareness of how participants' struggle with stress, 2) A Clean Pain versus Dirty Suffering Diary, with the aim of awareness of the difference between clean and dirty discomfort, 3) Rules of the Game of Life Exercise, with the aim of awareness of arbitrary rules and assumptions participants may be influenced by, 4) Awareness of Your Experience Meditation, with the aim of awareness of how easily and automatically participants evaluate or get caught up in mental activity,

and 5) Your Mind of a Card Exercise, with the aim of helping participants going about their life without having to attend to or base actions on unpleasant thoughts. The two mindfulness exercises that participants in the ACT group had the opportunity to report on included 6) the Tin Can Monster exercise, with the aim of helping participants learn acceptance of various parts of experience, and 7) The Observer exercise, with the aim of awareness of participants' "observer-self".

The four values-related practices participants in the ACT groups reported on included 1) Identifying work-related values and rating how well they are manifested, with the aim of awareness of values and current extent of instantiation in behavior, 2) Assessment of work-related goals, actions and barriers, with the aim to help participants plan the steps toward their values and awareness of barriers to these steps, 3) Attending Your Own Funeral exercise, with the aim of identifying what participants' want to be remembered for, and 4) Full Life Values assessment, with the aim of identifying life values.

Participants' extent of practice of the various acceptance/mindfulness practices introduced in the program was also assessed at post-treatment and each follow-up. Participants were asked to indicate whether or not they had 1) practiced the Awareness of Your Experience, Your Mind on a Card, Tin Can Monster, or Observer Exercise, 2) engaged in any other acceptance/mindfulness practice(s) from the program or other practice(s) that they had made up themselves or learned outside of the program, and 3) engaged in any other stress reduction/management strategies. For each affirmative response, the participants were asked to describe what they did and how often in their own words.

Chapter 3

RESULTS

Participant Recruitment

Based on power analyses involving effect sizes of outcomes in line with extant research on ACT, a study sample size of 60, with 30 participants for each intervention group, was sought. However, after 1.5 years of recruitment, only 33 individuals were consented across sites. Twenty-five of these individuals came from UM, 1 from Husson, 4 from EMMC, and 3 from UF/Shands. Due to the fact that a minimum of 6 participants needed to be recruited at any one site in order to administer the intervention (for at least 3 participants per program group), no intervention was administered with either EMMC, Husson, or UF/Shands employees.

Of the 25 individuals from UM who consented, 23 completed pretreatment measures. Prior to being assigned to a treatment group, a total of 7 out of the 23 were discontinued. Of these 7 individuals, 5 did not respond to contact or withdrew due to self-reported scheduling issues that prevented them from participating in the program and discontinued their participation prior to group assignment, while 2 participants withdrew after assignment to a group due to self-reported lack of time. The final sample size for the study was 16, with 8 participants in each of the two intervention groups. Six intervention groups in total were run; 2 of three participants each and 1 of two participants each, for each of the two intervention versions. Each participant attended each treatment session (i.e., zero attrition during treatment provision). However, 4

individual sessions occurred for four participants who were unable to attend their respective groups due to scheduling or illness.

Treatment Manual Adherence

Out of the 30 group sessions, 12 were evaluated for treatment manual adherence by two raters blind to the treatment condition. Tapes were chosen in such a manner that each rater evaluated one session from each treatment group within each of the 3 cohorts of participants. Rater A reviewed session 1, 3, and 4 from the AT intervention and session 2, 5, and 6 from the ACT intervention. Rater B reviewed session 1, 2, and 3 from the AT intervention and session 4, 5, and 6 from the ACT intervention.

The raters listened to the entire session tape and on a checklist devised for this study (see Appendix F) indicated 1) whether or not a particular therapy concept out of a list of 53 concepts was discussed, 2) the extent the discussion of each present concept followed the wording and action specified in the manual, rated either 1 = minimal, 2 = moderate, or 3 = high, and 3) the extent to which the facilitator(s) ran the session according to 7 attributes based on the basic therapeutic stance of ACT, rated either 0 = not at all, 1 = minimal, 2 = moderate, or 3 = high. The items of the checklist were based on the concepts of the manual devised for this study and based on the original ACT protocol, as well as the ACT Core Competency Self-Rating Form (available at <http://www.contextualpsychology.org>).

Adherence to Treatment Components

Results indicated 100% integrity of treatment components across sessions, with both raters indicating with 100% agreement that each session of each treatment contained discussion of all appropriate concepts, as listed within the checklist. Raters indicated that

none of the first four AT sessions contained discussion of any concepts from sessions 5 and 6 of the ACT manual, but that the first 4 sessions of the ACT intervention did contain discussion of all the concepts discussed in the first 4 sessions of the AT intervention. Thus, adherence to the manual during delivery allowed for high intervention discrimination to be attained.

Quality of Adherence to Treatment Components

With regard to the quality or extent of adherence to the manual in session discussion wording and actions, Rater A indicated that, on the 1 to 3 scale, mean quality of adherence was 2.75 across all her reviewed 6 sessions, while mean quality of adherence for Rater B was 2.94 across all her reviewed 6 sessions. Mean quality of AT sessions was 2.75 for Rater A (2.75, 2.80, and 2.67 for sessions 1, 3, and 4, respectively) and 2.90 for Rater B (3.00, 2.75, and 3.00 for sessions 1, 2, and 3). Mean quality of ACT sessions was 2.75 for Rater A (2.58, 2.78, and 3.00 for session 2, 5, and 6) and 3.00 for Rater B (3.00, 3.00, and 3.00 for sessions 4, 5, and 6). Thus, both raters indicated that discussions followed wording and actions as specified in the manual to a moderately high to high extent.

Adherence to Therapeutic Stance

Across AT sessions, the facilitator 1) discussed homework to a moderate-to-high extent [Rater A $M = 2.50$, Rater B $M = 3.00$], 2) expressed the idea that she is in the same boat as participants to a moderate degree [Rater A $M = 2.00$, Rater B $M = 2.00$], 3) was compassionate and avoided judgment to a high degree [Rater A $M = 3.00$, Rater B $M = 3.00$], 4) encouraged participants to pay attention to their own experience to a high extent [Rater A $M = 3.00$, Rater B $M = 3.00$], 5) argued or attempted to convince participants

nearly not at all [Rater A $M = 0.33$, Rater B $M = 0.33$], 6) explained the meaning of metaphors rather than having the group figure them out to a high degree [Rater A $M = 2.67$, Rater B $M = 3.00$], and 7) disclosed personal experiences appropriate to the discussion to a less than minimal degree [Rater A $M = 1.00$, Rater B $M = 0.33$].

Ratings across ACT sessions for the facilitator were very similar. The largest inter-rater difference was on the first item, on which Rater A indicated that the facilitator discussed homework to a minimal-to-moderate extent [$M = 1.33$], whereas Rater B indicated that she did so to a high degree [$M = 3.00$]. For the remaining items, the facilitator 2) expressed the idea that she is in the same boat as participants to a moderate-to-high degree [Rater A $M = 2.67$, Rater B $M = 2.00$], 3) was compassionate and avoided judgment to a high degree [Rater A $M = 3.00$, Rater B $M = 3.00$], 4) encouraged participants to pay attention to their own experience to a high extent [Rater A $M = 3.00$, Rater B $M = 3.00$], 5) argued or attempted to convince participants nearly not at all [Rater A $M = 0.00$, Rater B $M = 0.33$], 6) explained the meaning of metaphors rather than having the group figure them out to a high degree [Rater A $M = 3.00$, Rater B $M = 3.00$], and 7) disclosed personal experiences appropriate to the discussion to a minimal degree [Rater A $M = 1.00$, Rater B $M = 1.00$].

Thus both AT and ACT interventions were administered in a manner that adhered to the ACT core therapeutic stance to a moderate to high degree. Of exception and contrary to the stance are the observations that the facilitator frequently explained the meaning of metaphors to the groups and minimally disclosed personal experiences.

Evaluation of Data Characteristics & Analysis

Prior to analysis, the extent to which the study data met assumptions of tests being considered was evaluated. Apart from attention to level of measurement, this process involved evaluation of the normality of each variable's distribution, homogeneity of variance, and sample size adequacy. The study samples involved are very small, with data on 8 participants per intervention group at pre- and post-treatment. Thus issues regarding meeting the assumptions of parametric tests arose.

Results of the Shapiro-Wilks and Kolmogorov-Smirnov Lilliefors statistical tests for normality on each continuous variable at pre-treatment across the study sample and by condition indicated that the distributions of the vast majority of variables (e.g., 38 out of 41 at pre-treatment) were not significantly different from a normal distribution. As both of these statistics are extremely sensitive to departures from normality, Pearson skewness coefficients and Fisher kurtosis coefficients for the 8 variables with suspect distributions were examined and indicated that several of these distributions were in fact not significantly different from a normal distribution. Results of Levene tests on each continuous variable at pre-treatment indicated that only 2 (job motivation and overall value-to-action congruence in coping) out of the 41 variables had significantly different variances between the treatment groups.

Two additional issues considered in determining which statistical approach to utilize (i.e., parametric or nonparametric) were the absolute size of the study sample and whether there are equal numbers of participants in the subgroups being examined (Pett, 1997). In the statistical literature, there does not appear to be definitive agreement about size requirements when choosing between parametric and nonparametric tests. In

addition, the definition of “small” sample size is also not clear (e.g., Hays, 1994; Siegal & Castellan, 1988). Unequal cell sizes in subgroups are not prohibitive for simple between one-way group comparisons, particularly if the condition of homogeneity of variance is met. However, unequal sample cell size do give rise to the problem of confounding of main effects in factorial designs (e.g., repeated measures analyses), whether parametric or nonparametric (Tabachnick & Fidell, 1996).

Given these considerations, the level of measurement of the variables (i.e., ordinal), the small sample size for both conditions ($n = 8$), and further reduction in sample size that decreased further during the follow-up period, it was decided that nonparametric tests would be most appropriate statistical strategy for the study data. As a result, planned analyses of treatment effects using ANOVA and mediational procedures recommended by Judd and Kenny (1981) and Baron and Kenny (1986) were not undertaken.

Instead, data analyses involved the following tests of statistical significance: 1) the Mann-Whitney U test (i.e., the nonparametric counterpart to the independent samples t-test) to examine between-groups comparisons of outcomes at pre-treatment, post-treatment, and each follow-up; 2) the Wilcoxon rank test (i.e., the counterpart to the paired-samples t-test), was used to test within-group pretreatment to each follow-up differences, and 3) within treatment groups, mediation of outcomes by process variables was investigated by examining the degree of association, using Kendall’s tau-b (τ) correlational coefficients. This statistic was used instead of Spearman’s rho because tau has the advantage of having its distribution approach a normal distribution more quickly (i.e., requires a smaller sample size) than the Spearman rho distribution. As the statistical

software used (SPSS 16.0) did not allow for calculation of partial τ coefficients, these were calculated by hand and thus no significant levels are available for these statistics.

Given the small sample size in this study, the issue of statistical power to detect significant differences among groups (e.g., whether with parametric or nonparametric tests), was an overarching concern. As it may be unrealistic to expect any analyses to reach levels of conventional statistical significance, the two intervention programs in this study were also evaluated by examining effect sizes as a way to describe the effects within and between the interventions on measures. Effect size (ES) corresponds to a group of indices that measure the magnitude of a treatment effect. Unlike significance tests, these indices are independent of sample size and offer an adjunct approach to evaluation of the present study's specific interventions. Although the approach is not inferential and precludes generalization of results to the population, it does address the question of how much effect did each program version have and allows comparison with effect sizes noted in previous related research.

To assess between-condition differences, effect sizes on mean differences in each outcome between each treatment were calculated by determining the mean change in pre- to post-treatment scores, and dividing this by the pooled standard deviation of pre- and post-treatment scores, as described by Cohen (1977, p. 44). Instead of using the standard deviation (σ) of either group, the pooled standard deviation (σ_{pooled}), a common practice, (Rosnow & Rosenthal, 1996) was utilized. The formula follows for Cohen's effect size determination: $d = M_1 - M_2 / \sigma_{\text{pooled}}$, where $\sigma_{\text{pooled}} = \sqrt{[(N_1 - 1)\sigma_1^2 + (N_2 - 1)\sigma_2^2] / (N_1 + N_2 - 2)}$. Because Cohen's d is inaccurate for small samples ($N < 20$) and the present study sample is small, Hedges' g (Hedges & Olkin, 1985) was used. This procedure corrects for bias in

Cohen's *d*. Between- and within-condition effect sizes were calculated pre-treatment to post-treatment and pre-treatment to each follow-up assessment. Categorization of magnitude of effect sizes was done using criteria suggested by Cohen (1992), with $ES < .5$ being "small", $ES \geq .5$ being "medium", and $ES \geq .8$ being "large".

Some statisticians propose that to compute effect sizes for repeated measures the paired *t*-test value should be used to compute ES for correlated designs because it takes into account the correlation between the two scores (e.g., Rosenthal, 1991). However, others have convincingly argued that the between groups *t*-test value, or the original standard deviations of the scores, should be used because if the pooled standard deviation is corrected for the amount of correlation between the measures, then the ES estimate will be an overestimate of the actual ES (Dunlop, Cortina, Vaslow, & Burke, 1996). Thus, the original standard deviations of the scores were utilized in the ES calculations in the present study.

Participant Characteristics

The final total sample of participants who were administered the interventions was 16, with 8 receiving ACT and 8 receiving AT. The mean (SD) age of the sample was 40.8 ($SD = 10.7$) years with 15 females and 1 male. Eight (50%) of the participants were married, 4 (25%) were single, 3 (19%) were partnered, and 1 (6%) was divorced. Fourteen participants (88%) identified as Caucasian, 1 (6%) as Latina, and 1 (6%) as Hispanic. In terms of highest grade completed, 1 participant indicated high school, 6 (38%) had Bachelors degrees, 7 (44%) had Master's degrees, and 2 (13%) had doctoral degrees.

Results of the Lilliefors test (i.e., a modified Kolmogorov-Smirnov test), and the Levene test indicated that age was distributed normally and variances between the ACT and AT groups were not significantly different. A one-way analysis of variance (ANOVA) indicated there were no significant differences between the 6 treatment groups with respect to mean age, $F(5, 10) = 1.72, ns$. However, an independent samples t -test revealed that there was a significant difference in mean age between the two types of treatment, $t(14) = 2.13, p = 0.046$; the mean age for the ACT group was 35.5 ($SD = 11.7$) and the mean age for AT group was 46 ($SD = 7.0$).

Two-way contingency analyses were used to compare the categorical demographic characteristics between the 6 treatment program groups and between the ACT and AT treatment groups overall. Pearson χ^2 statistics should be interpreted with caution, as numerous cells within each analysis had counts less than 5. Across the 6 groups, there were no significant differences in participants' marital status [$\chi^2(15, N = 16) = 16.00, p = .382$], race [$\chi^2(10, N = 16) = 12.00, p = .285$], or education [$\chi^2(15, N = 16) = 16.76, p = .333$]. There were, however, significant differences in income [$\chi^2(25, N = 16) = 40.89, p = .024$] between the 6 groups, likely due to the many (6) categories of income and the small sample size. Between the ACT and AT treatment groups, there were no significant differences in marital status [$\chi^2(3, N = 16) = 2.83, p = .418$], race [$\chi^2(2, N = 16) = 2.29, p = .319$], or education [$\chi^2(3, N = 16) = 6.95, p = .3073$], but there was a significant difference in income [$\chi^2(5, N = 16) = 11.20, p = .048$], with more than half (5 out of 8) of the participants in the ACT group reporting annual income of 30,000 or less, whereas all the participants in the AT group reported income categories of over

30,000. Results of a Mann-Whitney U test indicated that the ACT and AT groups did not significantly differ in their level of work control [$U = 23.50, p = .602$].

The mean (and standard deviation) time between the last treatment session and completion of the post-treatment measures was 7.1 ($SD = 3.6$) days for the ACT group and 9.5 ($SD = 6$) days for the AT group. The mean number of days between completion of post-treatment measures and the first follow-up was 38.9 ($SD = 8.2$) for the ACT group ($n = 8$) and 34.4 ($SD = 10$) for the AT group ($n = 8$). The mean time between completion of the 1st and the 2nd follow-up measures was 105.5 ($SD = 15.2$) days or 15.1 ($SD = 2.2$) weeks or 3.75 ($SD = .6$) months for the ACT group ($n = 6$) and 98 ($SD = 11.4$) days or 14 ($SD = 1.6$) weeks for the AT group ($n = 6$). The mean time between the 2nd and the 3rd follow-up measures was 122.3 ($SD = 28.1$) or 17.5 ($SD = 4.0$) weeks for the ACT group ($n = 3$) and 145 ($SD = 32.5$) days or 20.7 ($SD = 4.6$) weeks for the AT group ($n = 3$). Thus, across the two groups, although the 1-month follow-up was in fact a 1-month follow-up, the 3-month follow-up in fact occurred approximately 4.5 months after program end and the 6-month follow-up in fact occurred approximately 9 months after program end.

Pre-treatment Comparisons on Participants' Expectations

Mann-Whitney U tests were conducted to evaluate if the ACT and AT groups differed in their pre-treatment expectations for treatment. Data was missing for one of the participants in the AT group. Results indicated the groups did not differ significantly in the extent to which they expected the treatment to 1) reduce their distress from work-related stressors [$U = 22.00, p = .428$, with the median rating being 4.0 (“Some”)], 2) reduce distress from stressors outside of work [$U = 26.00, p = .789$, with the median

rating being 4.0 (“Some”)], 3) help them experience more satisfaction or fulfillment in their work [$U = 25.50, p = .752$, with the median rating being 4.0 (“Some”) for each group], and 4) help them experience more satisfaction or fulfillment in their life [$U = 20.00, p = .269$, with the median rating being 4.0 (“Some”)]. In summary, participants in the ACT and AT groups did not differ in their expectations for treatment and both groups expected the intervention to have “some” positive effect on their well-being.

Intervention Evaluation Using Statistical Significance Testing

Results of comparisons between and within treatment groups at each assessment on all measures, using Mann-Whitney U tests, the Fisher Exact test (for the categorical variable SF-5c), Wilcoxon signed ranks tests, and the Binomial equal proportions test (again for SF-5c), are presented in Appendix B as Tables B1 through Table B10, rather than within the text, due to the large number of tables. Throughout, comparisons were two-tailed and were interpreted using the language of significance (** $p \leq .05$) and marginal significance (* $p \leq .10$). Due to the volume of analyses, readers are referred to the tables for statistical values of the non-significant findings.

Between-Group Pre-treatment Comparisons Across Measures

At pre-treatment, no significant or marginally significant median differences were found on any outcome or process measure or any subscale of any measure.

Within-Group Comparisons on Outcomes

Stress (Table B.1). On measures of stress, results indicated that participants within the AT group experienced a significant decrease in impact of job stressors pre- to post-treatment [$z = -2.24, p = .025$] while those in the ACT group did not. This significant improvement continued at the first [$z = -2.10, p = .036$] and second [$z = -1.99,$

$p = .046$] follow-ups. Contrary to expectations, there were marginally significant decreases in frequency of job stressors for both AT [$z = -1.76, p = .079$] and ACT [$z = -1.68, p = .092$] groups. Furthermore, the decrease in frequency became significant for participants in the AT group at the first [$z = -2.52, p = .012$] and the second [$z = -1.99, p = .046$] follow-ups. Although neither group experienced changes in impact of life stressors pre- to post-treatment, participants in the ACT group had a marginally significant decrease at the first [$z = -1.75, p = .080$] and the second [$z = -1.75, p = .080$] follow-ups.

Mental Health (Table B.2). Participants in the AT group reported a significant decrease in depression at post-treatment [$z = -1.97, p = .049$], whereas the reduction in depression for ACT group participants was marginally significant [$z = -1.86, p = .063$]. This decrease in depression continued and was significant at the first follow-up for AT [$z = -2.20, p = .028$] and then maintained and became marginally significant [$z = -1.76, p = .078$] at the second follow-up. The improvement remained marginally significant for ACT at both follow-ups [first: $z = -1.83, p = .068$, second: $z = -1.83, p = .068$]. State anxiety as well as general distress decreased significantly post-treatment for ACT participants [STAI-S, $z = -2.03, p = .043$; GHQ, $z = -1.96, p = .050$], but not for AT participants. However, at the first follow-up, both groups reported a significant improvement in general distress [AT, $z = -2.53, p = .011$; ACT, $z = -2.21, p = .027$] and AT participants reported a significant decrease in state anxiety [$z = -2.03, p = .042$]. The improvement in state anxiety for ACT participants was marginally significant at the second follow-up [$z = -1.79, p = .074$].

Health, Functioning, & Quality of Life (Table B.3). Neither group reported a change in general physical health at post-treatment or first follow-up, but there was a marginally significant improvement for ACT participants at the second follow-up [$z = -1.73, p = .084$]. On measures of impact on functioning and quality of life, ACT participants evidenced a marginally significant decrease pre- to post-treatment in interference by health or emotional problems on social activities [$z = -1.82, p = .068$]. The decrease became significant at the first follow-up [$z = -2.07, p = .038$] and was marginally significant at the second follow-up [$z = -1.73, p = .084$]. Although neither group experienced a change in quality of life measures at post-treatment, the ACT group participants did exhibit a significant increase in overall quality of life [$z = -2.02, p = .043$] and a marginally significant increase in work-specific quality of life [$z = -1.84, p = .066$] at the second follow-up.

Work Attitudes (Table B.4). Neither group experienced significant changes in measures related to work attitudes at post-treatment. However, at the second follow-up, AT participants reported a marginally significant increase [$z = -1.89, p = .058$] and ACT participants reported a significant increase [$z = -1.99, p = .046$] in job satisfaction. ACT participants also reported a marginally significant in work importance [$z = -1.84, p = .066$], however, this finding was likely due to a decreased sample size, as median score was identical at each assessment.

Within-Group Comparisons on Process Measures

Locus of Control, Affect & Cognition (Table B.5 and B.6). ACT participants, but not AT participants, reported a marginally significant increase in work locus of control at the first [$z = -1.87, p = .062$] and second [$z = -1.89, p = .058$] follow-ups. With the

exception of a significant decrease in negative affect for participants in the ACT group [$z = -2.52, p = .012$] no changes at post-treatment were evident for either treatment group in any other measures of affect and cognition pre- to post-treatment. The decrease in negative affect for ACT remained significant at the first follow-up [$z = -2.05, p = .041$] and was marginally significant at the second follow-up [$z = -1.75, p = .080$]. Also for the ACT group, trait anxiety decreased marginally significantly pre-treatment to the second follow-up [$z = -1.89, p = .058$]. Although negative affect did not change for participants in the AT group pre- to post-treatment, it decreased significantly at the first [$z = -2.21, p = .027$] as well as the second [$z = -2.03, p = .042$] follow-up.

Although no changes were evident pre- to post-treatment on any measures of automatic thinking, belief in negative automatic thoughts decreased significantly pre-treatment to the second follow-up for both AT [$z = -2.02, p = .043$] and ACT [$z = -2.04, p = .041$] participants. ACT participants also reported a marginally significant decrease in belief in negative thoughts at the first follow-up [$z = -2.03, p = .042$], and, unexpectedly, a marginally significant decrease in frequency of positive thoughts at first follow-up [$z = -1.79, p = .074$] and in frequency of negative thoughts at the second follow-up [$z = -1.84, p = .066$].

Mindfulness, Coping, & Values (Table B.7, B.8, B.9, & B.10). Participants in both groups did not report significant changes in psychological flexibility (AAQ) or its subscales of Willingness (AAQ-W) and Action (AAQ-A) at post-treatment. Participants in the ACT group reported a marginally significant increase in overall mindfulness [FFMQ: $z = -1.89, p = .058$] at post-treatment that was maintained at the first follow-up [$z = -1.68, p = .093$]. ACT participants also reported marginally significant increases at the

first follow-up on the Acting with Awareness subscale [$z = -1.78, p = .075$] and the Describing subscale [$z = -1.81, p = .071$] of the FFMQ. Surprisingly, scores on the Nonreactivity subscale of the FFMQ decreased significantly pre-treatment to the second follow-up for the AT group [$z = -2.06, p = .039$].

No significant pre- to post-treatment changes were evident for either group on the measures of use of coping or value placed on coping. However, AT participants reported a marginally significant decrease in value placed on avoidance coping at the first follow-up [$z = -1.71, p = .087$] that was maintained at the second follow-up [$z = -1.76, p = .078$], whereas ACT participants reported a marginally significant increase in value placed on approach coping at the second follow-up [$z = -1.89, p = .059$] and a decrease in engagement in avoidance coping at the first follow-up, [$z = -1.84, p = .066$]. There were no significant changes on the coping-related values-to-action congruence measures at any time for either group.

Between-Group Comparisons Across Measures

There were no significant median differences between the AT and ACT groups at any assessment for any measure of stress, mental health, or physical health. There was a significant difference between groups at post-treatment in proportion of participants indicating not doing work or other activities as carefully as usual due to emotional problems (Fisher Exact test $p = .032$), with 1 out of 8 ACT participants compared with 4 out of 5 AT participants indicating an affirmative response. There was a marginally significant difference between groups at post-treatment [$U = 8.00, p = .062$] and the first follow-up [$U = 7.00, p = .081$] regarding the extent of interference in social activities by physical health or emotional problems. The difference became significant at the second

follow-up [$U = 0.50, p = .035$]. At each time point, participants in the AT group indicated greater interference.

Job motivation was marginally higher in the ACT group at the first follow-up [$U = 11.00, p = .090$] but higher for the AT group at the third follow-up [$U = 1.50, p = .070$]. At the second follow-up, negative affect was marginally significantly lower [$U = 4.50, p = .094$] and believability in negative automatic thoughts significantly lower for participants in the AT group [$U = 4.00, p = .076$]. Also at the second follow-up, participants in the AT group had marginally significantly higher AAQ-A scores than participants in the ACT group [$U = 5.50, p = .081$]. The only differences between groups on the coping and values-related measures were marginally significant greater value placed on approach coping at the third follow-up [$U = 1.50, p = .065$] and approach coping values-to-action incongruence at post-treatment [$U = 13.50, p = .091$] for participants in ACT than for those in AT.

Intervention Evaluation Using Effect Size

Means, mean differences, and Hedge's g effect sizes for within and between treatment groups for each outcome and process variable are presented in Tables D1 through D10 in Appendix D. Mean differences between the groups were calculated by subtracting the ACT group mean from the AT group mean at each of the 5 time (T) points. Mean differences over time for each group were calculated by subtracting the mean score at pre-treatment from the mean score at each subsequent assessment. Throughout, comparisons were two-tailed and were interpreted using cutoffs of $d < .5$, medium, $* d \geq .5$, and $**$ large, $d \geq .8$ for effect sizes. None of the effect sizes were statistically significant.

Between-Group Effect Sizes for Outcome Measures

Looking across all measures, effect sizes for differences between the AT and ACT groups on mean scores across measures were generally small. There were however some medium size and a few large size differences. With respect to outcome measures, participants in AT reported lower life stressor frequency and impact at pre-treatment, second follow-up and third follow-up, with medium size differences. Participants in the AT group also reported lower depression and anxiety at the first follow-up, while participants in the ACT group reported lower general distress at post-treatment, with medium size differences. Mean scores on physical ill health were higher for those in ACT than those in AT at pre-treatment, but less for ACT than for AT at the second and third follow-up. Also medium sized was the higher quality of life reported by participants of AT at the second follow-up and work quality of life at post-treatment and second follow-up. Group differences in the large effect size range occurred for the measure of interference in social activities by physical health of emotional problems, in which ACT participants reported lower interference at post-treatment and each follow-up. ACT participants also reported greater levels of job motivation compared with those in AT at the first and third follow-up, with magnitudes of both effects being large.

Between-Group Effect Sizes for Process Measures

AT participants had lower scores, with a large effect size, for negative affect at first and second follow-up, whereas ACT participants had lower scores in the medium range for trait anxiety at second and third follow-up, although there was a very significant difference in sample size between the groups at these time points on this measure. Interestingly, the ACT group reported higher means across assessments for automatic

negative thought frequency and believability than did the AT group, with large size differences at the second follow-up for each measure, whereas the AT group reported generally higher automatic positive thought frequency and believability than did the ACT group, with medium sized differences between the groups at the second follow-up for each measure.

Interestingly, ACT participants had a higher AAQ Willingness mean than AT participants at the second follow-up with a medium size effect difference, whereas AT participants had a higher AAQ Action mean than ACT at the second follow-up, with a large effect size. On the FFMQ, the ACT group had higher means than the AT group across assessments on overall mindfulness and nearly all subscales with the exception of Describing. These differences were generally in the small range, but were medium size for Nonreactivity at the first and second follow-up and for Nonjudging at the first and third follow-up.

Across the measures of coping, differences in means between the groups were medium sized for several measures and large for one. Participants in ACT reported higher value placed on approach coping at post-treatment and third follow-up (the one large size effect), and lower use of avoidance coping at first follow-up. Participants in the AT group reported lower value placed on avoidance coping at the second follow-up, higher value-to-action congruence for approach coping at post-treatment, and higher value-to-action congruence for avoidance coping at second follow-up but lower congruence at the third follow-up.

Within-Group Effect Sizes on Outcome Measures

Looking within each treatment group across the assessments, participants in the AT group had greater sized improvements in job and life stressor frequency and impact than participants in the ACT group, with the exception of life stressor frequency at first follow-up and life stressor impact at post-treatment and first follow-up. Both groups had medium sized improvements in depression at post-treatment, and these improvements became large for both groups at the follow-ups. Contrary to expectations, the AT group had greater alleviation in depression than ACT throughout the follow-ups. ACT participants improved more in state anxiety at post-treatment than AT participants, but AT participants had a greater improvement at the first follow-up than participants in ACT. Both groups experienced large improvements in general distress during follow-up, while only ACT participants had a large improvement at post-treatment. While AT participants had an increase in ill health across assessments, ACT participants had improvements in the medium range. The ACT group had a large improvement in extent of interference in social activities from problems at post-treatment, which was maintained at the follow-ups, while the AT group had an increase in interference. Neither group experienced more than minimal improvement in work quality of life, until a medium sized change at the second follow-up. The increase in job satisfaction at the second follow-up was large for the ACT group and medium sized for the AT group.

Within-Group Effect Sizes on Process Measures

Compared with pre-treatment, participants in the ACT group improved in work locus of control at the first follow-up to a medium extent, while those in the AT group reported a minimal increase. Although negative affect decreased to a medium extent for

participants in ACT and to a small extent for those in AT at post-treatment, improvement at the first follow-up was large for the AT group and medium for the ACT group. Although participants in AT reported minimal to small decreases in trait anxiety, participants in ACT reported medium sized decreases at post-treatment and medium to large improvements at the follow-up assessments. Both groups had medium sized reductions in frequency of negative thoughts and large reductions in believability of negative thoughts at the first and second follow-up.

The treatment groups did not appear to differ in their minimal changes on the AAQ and its subscales. The exception was the Action subscale, on which participants in ACT reported a medium-sized improvement versus a small one for those in AT at post-treatment, while participants in AT reported a large-sized improvement versus a medium one for those in ACT at the second follow-up. Across assessments, participants in ACT indicated medium-sized improvements in the FFMQ, compared to minimal changes reported by participants in the AT group. Participants in ACT also reported large sized increases in the Nonreactivity subscale at the first follow-up and medium sized improvements on the Acting with awareness subscale at post-treatment and follow-up, while participants in AT did not.

For measures of coping, participants in ACT reported no change at post-treatment in their use of approach coping, but did indicate a medium sized increase in use of this strategy at the first follow-up that maintained at subsequent follow-ups, while participants in AT had a small increase in use at post-treatment that maintained at follow-ups. The AT group reported large decreases in value placed on avoidance coping at the second and third follow-up, while the ACT group did not even report small changes. Participants in

ACT did, however, indicate medium sized decreases in actual use of avoidance coping at the first and second follow-up, while those in AT had such a decrease only at the second follow-up. Overall value-to-action congruence improved to a medium extent for both groups at the first follow-up. Participants in AT indicated a medium size improvement in congruence for approach coping at post-treatment, while participants in ACT did not report a medium sized increase until the first follow-up, with virtually no difference at post-treatment. Participants in AT also reported a medium size improvement in avoidance coping congruence at the second follow-up.

Associations Between Process and Outcome Measures

As mediation assumes that the mediator variable changes prior to changes in the outcome it is proposed to mediate and the largest improvements in outcomes and the greatest number of improved outcomes occurred at the second follow-up for both groups, correlational coefficients (Kendall's τ) were assessed between outcomes that experienced a meaningful change at the second follow-up (T4) with process variables that experienced a meaningful change at the first follow-up (T3). Meaningful change in a measure was again defined as a statistically or marginally statistically significant median change or a mean effect size at least medium in magnitude between pre-treatment and the specified subsequent assessment. Results are presented in Tables C1 through C4 of Appendix C.

Stress Outcomes (Table C.1)

Results indicated that for stress-related outcomes, no T3 process measure correlated even marginally significantly with frequency or impact of job stressors for participants in AT. Thus these outcomes for AT was correlated with improved process variables at T4 and the Action subscale of psychological flexibility was found to be the

one significant predictor with frequency, although the association was surprisingly positive [$\tau = 0.74, p < .10$], and the avoidance coping value and action scales both positively predicted job stressor impact to an identical degree [$\tau = 0.89, p < .05$]. For the ACT group, job stressor frequency was negatively predicted by work locus of control [$\tau = -0.74, p < .10$] and the Acting with Awareness subscale of mindfulness [$\tau = -1.00, p < .01$], and positively by use of avoidance coping [$\tau = 0.91, p < .10$]. After controlling for work locus of control, both Acting with Awareness and use of avoidance coping continued to correlate to a high extent with this outcome [$\tau = -.64$ and 0.88 , respectively]. While frequency of life stressors in the AT group was associated positively with frequency of negative thoughts [$\tau = 0.80, p < .05$] and overall coping congruence [$\tau = 0.95, p < .05$], it was positively associated with negative affect [$\tau = 0.80, p < .05$] and negatively with the Nonreactivity subscale of mindfulness [$\tau = -0.80, p < .05$] for the ACT group. Negative affect [$\tau = 0.80, p < .05$] and Nonreactivity [$\tau = -0.80, p < .05$] also predicted impact of life stressors for the ACT group, while overall coping congruence [$\tau = 0.74, p < .10$], but not frequency of negative thoughts, predicted life stressor impact for the AT group. Nonreactivity continued to predict both frequency of life stressors [$\tau = -0.68$] and impact of life stressors [$\tau = -0.68$] for participants in ACT even after the effects of negative affect were partially out.

Mental Health Outcomes (Table C.2)

Depression was associated with negative affect [$\tau = 0.74, p < .10$] and frequency of negative thoughts [$\tau = 0.74, p < .10$] for participants in AT, but with overall mindfulness for participants in ACT [$\tau = -0.80, p < .10$]. The association between negative thoughts and depression remained high even after controlling for the effect of

negative affect [$\tau = 0.59$]. Although state anxiety did not associate with any T3 process variable for the AT group, it was positively related to frequency of negative thoughts at T4 [$\tau = 0.80, p < .05$]. Nonreactivity negatively predicted state anxiety for the ACT group [$\tau = -1.00, p < .01$]. General distress in participants of the AT group was most correlated with value placed on avoidance coping [$\tau = -0.71, p < .10$], although the association was surprisingly negative, whereas in participants of ACT general distress had a significant association with Nonreactivity [$\tau = -0.80, p < .05$], which remained high [$\tau = -0.62$] even after the association with negative affect [$\tau = 0.60, p < .10$] was controlled for.

Health, Functioning, & Quality of Life Outcomes (Table C.3)

For the improvements reported by participants in ACT, general physical ill health was associated with engagement in avoidance coping [$\tau = 1.00, p < .01$], while interference in social functioning due to mental or physical problems was negatively correlated with the Acting with Awareness subscale of mindfulness [$\tau = -0.76, p < .10$].

While the improvement in overall quality of life in participants in ACT was associated with Nonreactivity [$\tau = 0.95, p < .05$], work-related quality of life in neither the ACT nor the AT group correlated with any T3 process variable. Its positive association with T4 belief in negative thoughts in the AT group [$\tau = 0.74, p < .10$] was unexpected, while its association in the ACT group with T4 frequency of positive thoughts [$\tau = .94, p < .05$] and value placed on approach coping [$\tau = 0.89, p < .05$] more in line with predictions.

Job Satisfaction (Table C.4)

Job satisfaction was most correlated with higher overall coping congruence for participants in AT [$\tau = -0.83, p < .05$] and with lower use of avoidance coping for participants in ACT [$\tau = -0.91, p < .10$].

Analyses specific to Hypothesis Seven indicated that job satisfaction at the second follow-up did not correlate significantly with pre-treatment levels of work control, negative affectivity or work locus of control for the AT group [WCS, $n = 5, \tau = .32, p = ns$; NAS, $n = 6, \tau = .28, p = ns$; WLoC, $N = 6, \tau = .45, p = ns$] or the ACT group [WCS, $n = 6, \tau = .07, p = ns$; NAS, $n = 6, \tau = -.33, p = ns$; WLoC, $n = 6, \tau = .47, p = ns$]. As sample size may have been an issue, the two groups were combined and analyses rerun. Results indicated that although work control and negative affect continued to fail to correlate [WCS, $N = 11, \tau = .24, p = ns$; NAS, $N = 12, \tau = .08, p = ns$], work locus of control did emerge as a significant predictor [$N = 12, \tau = .54, p = .015$].

Results for Group Process Measures

Extent Expectations Were Met (Table E.1)

As noted above, participants in the ACT and AT groups did not differ in their expectations for treatment and both groups expected the intervention to have “some” positive effect on their well-being. Results of Mann-Whitney U tests of these expectancies items at post-treatment indicated that the treatment groups did not differ significantly to the extent to which the treatment reduced distress from work-related stressors [$U = 17.50, p = .934$, with the median rating being 4.5 (“Some” to “Much”) for AT and 4.0 (“Some”) for ACT], reduced distress from stressors outside of work [$U = 12.00, p = .394$, with the median rating being 4.5 (“Some” to “Much”) for AT and 5.0

(“Much”) for ACT], helped them experience more satisfaction or fulfillment in their work [$U = 14.00, p = .589$, with the median rating being 3.5 (“A little” to “Some”) for AT and 4.0 (“Some”) for ACT], and helped them experience more satisfaction or fulfillment in their life [$U = 14.00, p = .589$, with the median rating being 4.0 (“Some”) for both AT and ACT]. Thus, participants in both groups had their pre-treatment expectations for the program met or exceeded post-program.

The treatment groups did not significantly differ on any of the expectancy items at any follow-up assessment. Looking across follow-up assessments, both groups indicated continued alleviation of work-related and non-work-related stress and increase in work and life satisfaction to generally “a little” extent. A comprehensive presentation of test statistics and median values for each group can be found in Table E.1 of Appendix E.

Group Cohesiveness (Table E.2)

Analysis of the Feelings About the Group Questionnaire at post-treatment using Kruskal-Wallis and Mann-Whitney tests indicated that there were no significant differences between the 6 program groups $\chi^2(5, N = 16) = 5.94, p = .312$ or between the two treatments ($U = 31.50, p = .957$). Both AT and ACT had a median score of 36.50. On the item asking how often their group should have met compared to how often it did meet, there were no significant differences between the 6 program groups $\chi^2(5, N = 16) = 6.80, p = .236$, or between the two treatments ($U = 28.00, p = .535$). Both AT and ACT had a median response of 3.00 (“No more often”). With respect to participants’ evaluation of the group facilitator, there were no significant differences between the 6 program groups $\chi^2(5, N = 16) = 2.46, p = .782$ or between the two treatments ($U = 26.00, p = .464$). Both AT and ACT had a median response of 6.00 (“Extremely satisfied”).

Skills Practice Monitoring

During the administration of the intervention, participants in both the AT group ($n = 8$) and the ACT group ($n = 7$) each reported that, between session 1 and session 4, they engaged in a median of 3 (out of the 5) mindfulness practices, with a median level of benefit in terms of stated aims of 3.68 (Somewhat to Quite a bit) for the AT group and 4.00 (Quite a bit) for the ACT group [$U = 25.00, p = .722$]. Participants in the ACT group reported at session 6 that they engaged in a median of 4 out of the 4 values-related practices between session 5 and 6, with a median level of benefit in terms of stated aims of 4.13 (Quite a bit).

Results of participants' reports of post-treatment and follow-up skills practice are presented in Table E2 of Appendix E. There were no significant differences on any practice categories at any assessment except at the third follow-up, when all 3 ACT participants reported engagement in other stress management strategies and none of the 5 AT participants reported such engagement [Fisher Exact test $p < .05$]. Although not statistically significant, at post-treatment and each follow-up, a greater percentage of participants in ACT than in AT reported use of other acceptance/mindfulness practice(s) from program, other practice(s) made up or learned outside of the program, and other stress management strategies.

Chapter 4

DISCUSSION

The present study had three major aims: 1) to ascertain the effects of the mindfulness-based components of Acceptance and Commitment Therapy without the values-based components, 2) to investigate whether and how ACT's values components significantly add to the therapy's effects beyond those of the mindfulness components, and 3) to examine factors that may serve as mediators of ACT's effects. Several specific hypotheses were examined and findings are first summarized within the context of these hypotheses and then discussed in greater detail in relation to extant research. Throughout this discussion, meaningful change pre-treatment to the specified assessment time in a measure are defined as a statistically or marginally statistically significant median change or a mean effect size at least medium in magnitude.

Hypothesis One

The first study hypothesis was that participants in the ACT group and in the abbreviated AT group would experience significant improvements from pre-treatment to post-treatment on all measures, except for those assessing frequency of life and job stressors. Study findings indicated that three outcomes (frequency and impact of job stressors and depression) and one process variable (approach coping congruence) improved for participants in the AT group, while seven outcome (frequency of job stressors, impact of life stressors, depression, state anxiety, general distress, physical health, and interference in social functioning) and five process variables (negative affect, trait anxiety, the Action subscale of the AAQ, overall mindfulness, and the Acting with

Awareness subscale of the FFMQ) improved for participants in the ACT group. Thus, participants in ACT experienced meaningful changes in a greater number of measures than did participants in the AT group.

Hypothesis Two

The post-treatment improvements were expected to be equivalent for both groups on most measures. Greater improvement were expected for participants in the ACT group on several variables that were proposed to be particularly influenced by values clarification, including a) the Action subscale of the AAQ, b) use of active and avoidance coping, c) value-to-action congruence in coping overall and each type of coping specifically, and d) job attitudes. Findings were consistent with the first part of this hypothesis, as there were no statistically significant differences between the AT and ACT groups at post-treatment or other assessment for any measure of stress, mental or physical health, quality of life, affect or cognition, or mindfulness. Also consistent was the finding that the ACT group, but not the AT group, experienced a meaningful change in the Action subscale of psychological flexibility.

However, as noted above, participants in the ACT group reported meaningful improvement at post-treatment in more than double the number of outcome and process measures than participants in the AT group. Furthermore, the AT group, but not the ACT group, reported an improvement in approach coping congruence. In terms of size of improvements, mean difference effect sizes pre- to post-treatment on the two outcomes that both groups improved on (i.e., frequency of job stress and depression) were similar.

Hypothesis Three

At each follow-up assessment, post-treatment improvements were expected to be maintained for participants in the AT group and to increase further for participants in the ACT group, due to the proposed influence of values clarification on motivation and maintaining commitment to therapy skills. Findings, however, generally supported greater improvement in follow-up outcome scores for participants in the AT group, while maintenance of post-treatment gains was the case for participants in ACT.

For the AT group, all three of the outcomes that improved post-treatment continued to improve to a further extent at the first follow-up, while only one (i.e., impact of life stress) post-treatment outcome continued to improve for the ACT group. Four outcomes (i.e., impact of job stressors, frequency of life stressors, impact of life stressors, and state anxiety) improved further from the first to second follow-up for the AT group, while only one (i.e., depression) improved further across the same period for the ACT group.

Meaningful improvements in process measures tended to persist but not improve further from when they initially emerged as meaningful for both groups. Exceptions to this trend were further decreases from the first to the second follow-up in frequency of and believability in negative thoughts for participants in the AT group (from medium to large effect sizes) and in trait anxiety for participants in the ACT group (also from a medium to a large effect).

Of note, the number of outcomes and process measures that changed for participants in the AT group increased from post-treatment to the second follow-up, with the three at post-treatment being joined by four others (frequency and impact of life

stress, state anxiety, and general distress) at the first outcome, and those seven being joined by two others (work quality of life and job satisfaction) at the second follow-up. For participants in the ACT group, five of the seven improved outcomes at post-treatment remained at the first follow-up (frequency of job stress and state anxiety dropped out) and were joined by frequency in life stressors, but all seven reemerged at the second follow-up and, along with frequency in life stressors, were joined by three others (overall and work quality of life and job satisfaction).

In terms of within-group effect sizes for the seven outcomes that changed for both groups between pre-treatment and post-treatment as well as pre-treatment and the first follow-up, the only difference was that that ACT group experienced large effects on frequency and impact of life stressors while the AT group had medium effects. Of the eight outcomes that improved pre-treatment to the second follow-up for both groups, the AT group experienced large effects on frequency of job stressors and of life stressors, while effects for the ACT group were medium, but the ACT group experienced a large effect on job satisfaction, compared to the AT's group medium effect. These findings are consistent with previous research specifically on ACT for stress that indicates effect sizes for outcomes in the large range (Hayes et al., 2006; Bond & Bunce, 2000).

Between-group effect sizes on outcome measures that did not differ (in mean score) at pre-treatment overwhelmingly indicated greater treatment effects for the AT rather than ACT group, with seven medium sized differences favoring AT, five of which occurred at a follow-up assessment, and only two favoring ACT. Between-group effect sizes on process measures indicated ten effects in favor of AT and eight in favor of ACT. These between-group effect sizes were generally in line with the magnitude of those

reported by Hayes and colleagues (2006) of between-condition effect sizes for randomized controlled trials of ACT and comparison conditions (medium to large at post-treatment and large at follow-up on outcomes and large at post-treatment and at follow-up on primary process of change in favor of ACT).

Hypotheses Four and Five

For both the ACT and the AT group, improvements on outcome measures were expected to be mediated by improvements in process measures. In addition, the ACT group was expected to experience greater associations than the AT group between improved outcome measures and the Action subscale of psychological flexibility, overall stress coping values-to-behavior congruence, use of approach coping, use of avoidance coping, approach coping values-to-behavior congruence, and avoidance coping values-to-behavior congruence.

Kendall's τ correlational coefficients between outcomes that changed meaningfully at the second follow-up (T4) and process variables that changed meaningfully at the first follow-up (T3) indicated that even when process variables that improved across both groups were considered, the same outcomes for participants in the AT group and in the ACT group were associated with different process variables. Nearly all outcomes found significant associations with either one or two process variables from the previous assessment and all of these correlations were high.

For participants in the ACT group, five outcomes were predicted by the Nonreactivity mindfulness subscale, three outcomes by negative affect, three by use of avoidance coping, two by the Acting with Awareness mindfulness subscale, one by work locus of control, one by overall mindfulness, and one by Time 4 frequency of positive

thoughts and value placed on approach coping. For participants in the AT group, three outcomes were predicted by overall coping congruence, two by frequency of negative thoughts, one by negative affect, one by value placed on avoidance coping, and four outcomes were individually associated with predictors from Time 4, which included the Action subscale of psychological flexibility, frequency and believability of negative thoughts, and value placed on and use of avoidance coping. It must be noted, however, that given the small sample sizes ($N = 6$ for the majority of analyses), other process variables may have emerged as possible mediators if the study sample had been larger.

Thus, in terms of Hypothesis 5, the AT group, but not the ACT group, reported improvement in and potential mediation by the T4 Action subscale of psychological flexibility and experienced potential mediation by overall stress coping values-to-behavior congruence. Consistent with expectations, participants in the ACT group did, however, report improvement in and potential mediation by use of approach coping, use of avoidance coping, and approach coping values-to-behavior congruence. Neither group experienced a meaningful change in avoidance coping values-to-behavior congruence post-treatment through the first follow-up.

Hypothesis Six

Findings did not support the expectation that participants in the ACT group would report greater post-program practice of the mindfulness intervention skills than participants in AT. However, at the third follow-up, all three ACT participants reported engagement in other stress management strategies and none of the five AT participants reported such engagement, a difference that did reach statistical significance. In addition, at post-treatment and each follow-up, a greater percentage of participants in the ACT

group than in the AT group reported use of other acceptance/mindfulness practice(s) from program, other practice(s) made up or learned outside of the program, and other stress management strategies.

Participants in ACT may have engaged in a greater variety of acceptance and stress management approaches and techniques than participants in AT due to the effects of values clarification on behavioral goal setting and follow-through, as discussed in greater detail below, in the section on values-related measures.

Hypothesis Seven

Findings did not support the hypothesis that within both the ACT and the AT group, improvements in job satisfaction would be mediated by pre-treatment levels of work control, negative affectivity, and work locus of control. However, when the two groups were combined and analyses rerun, higher pre-treatment work locus of control did significantly and to a high degree predict higher job satisfaction at the second follow-up.

The null findings are contrary to previous research on workplace stress indicating an association between higher levels of negative affectivity and greater levels of job dissatisfaction later in time (e.g., Brief & Roberson, 1989; DeNeve & Cooper, 1998), including work by the authors who initially investigated ACT and its constructs in the context of workplace stress (Bond & Bunce, 2003), as well as previous findings of the association between work control and job satisfaction (Bond & Bunce, 2003; Hackman & Lawler, 1971; Karasek, 1979). The finding regarding work locus of control, however, is consistent with prior studies (e.g., Bond & Bunce, 2003; Jex, 1998; Parkes, 1991) that found that individuals with a lower internal locus of control at Time 1 experienced lower levels of job satisfaction at Time 1. The current finding, based on longitudinal data,

actually expands on previous work by suggesting a possible predictive role for locus of control.

Discussion of Specific Findings on Outcomes

Stress

Contrary to expectations, there were meaningful decreases in frequency of job stressors for both AT and ACT groups, although effect sizes for changes in means were small. Moreover, the improvement continued for participants in both groups, reaching a medium effect size for those in AT although not for those in ACT. Frequency of life stressors improved meaningfully for both groups at the first follow-up, continuing to improve for the AT group and maintaining its gain for the AT group at the second follow-up.

Previous research has not assessed ACT's effect on the frequency of stressors. The observed decrease in these outcomes for both treatment groups may have been due to a redefining of the meaning of stressor by participants. Items on the measures of job and life stress are worded in such a manner that the presence of distress is automatically implied (e.g., Assignment of disagreeable duties, Experiencing a negative attitude toward organization, Struggling to meet your own standards of accomplishment). The intervention may have decreased participants' tendency to negatively evaluate their experience, either directly or through changes in mental well-being outcomes such as depression. As the intervention focused on work stress and it would have taken time for participants to generalize program approaches learned to other life domains, it is not unexpected that frequency of job stressors improved before frequency of life stressors.

In terms of stress impact, participants within the AT group, but not those in ACT, experienced a significant post-treatment decrease in impact of job stressors which continued at the first and second follow-ups, with medium-sized effects. Interestingly, although AT appeared to be more effective for job stress, participants in ACT experienced greater improvement in life stressor impact post-treatment and at the first follow-up compared with the AT group, with medium to large effect sizes (although the ACT group did have a higher impact score at pre-treatment than the AT group). Contrary to hypothesis three, improvements continued to increase in magnitude for a longer follow-up duration for the AT than the ACT group.

No studies to date have examined the effect of mindfulness or ACT on a specific measure of job stressor impact, only strain related outcomes. However, the findings that both AT and ACT resulted in improvement in life stressor impact are consistent with past research indicated that mindfulness-based stress reduction at work decreases effect of daily hassles post-treatment (Williams, 2006; Williams, Kolar, Reger, & Pearson, 2001). However, the present investigation also suggests that the mindfulness-based intervention utilized (AT) results in further improvement that is large in effect size at least through the 4.5-month follow-up.

Mental Health

As hypothesized, participants in both the AT group and the ACT group experienced an improvement in depression at post-treatment that was similar in magnitude of effect (medium). Contrary to the third hypothesis, depression scores for the AT group continued to improve at the first follow-up and reached a large magnitude of

effect, while the post-treatment improvements for the ACT group were simply maintained.

State anxiety decreased significantly and to a medium mean difference effect size for ACT but, contrary to expectations, not for AT participants at post-treatment. The AT group did, however, experience a decrease in anxiety post-treatment through the second follow-up, with a large magnitude effect size, whereas anxiety actually increased in the ACT group at the first follow-up before decreasing again at the second follow-up.

Similarly to anxiety, general distress decreased significantly and to a large extent for ACT but, contrary to expectations, not for AT participants at post-treatment. Again contrary to the third hypothesis and similar to depression, general distress decreased to below post-treatment level for the AT group but remained near the post-treatment level at each follow-up for the ACT group.

The findings of decreased depression at post-treatment and follow-up for AT is consistent with work on cognitive distancing, the early form of ACT (Zettle & Hayes, 1986; Zettle & Rains, 1989). The current findings on mental health outcomes for ACT are consistent with past research showing improvements in depression, anxiety, and distress (e.g., Branstetter et al., 2004, as cited in Hayes et al., 2006; Dalrymple & Herbert, 2007; Forman, Herbert, & Moitra, 2007; Twohig, Shoenberger, & Hayes, 2007). Magnitude of effects for general distress and depression were similar to those found in the initial trial by Bond and Bunce (2000) of ACT for workplace stress.

Health & Functional Interference

Contrary to expectations, neither group reported a statistically significant improvement in general physical health at post-treatment, but those in ACT reported a

medium size decrease in mean score that maintained at each follow-up. Surprisingly, participants in the AT group actually reported higher ill health at post-treatment and each follow-up than they did at pre-treatment.

Few studies have looked at physical illness and ACT. One investigation did show that ACT in addition to medical treatment as usual resulted in fewer sick days and fewer medical visits for a sample of public health service workers reporting chronic stress or pain and that this effect continued to an even greater extent at 6-month follow-up (Dahl et al., 2004). However, no changes in stress or quality of life were observed in that study but were in the present investigation.

With respect to functional interference by distress, only 1 out of 8 ACT participants compared with 4 out of 5 AT participants indicated at post-treatment not doing work or other activities as carefully as usual due to emotional problems. Although the ACT group did not report any further meaningful decrease in interference, the participants did maintain their post-treatment gains across the entire follow-up period. Consistent with expectations, participants in ACT reported less interference than those in AT in social activities by emotional or psychological problems. Higher functional ability has been found as an outcome at post-treatment and follow-up in studies of ACT for samples with severe anxiety or depression (Forman, Herbert, & Moitra, 2007) and for those with chronic pain (Wicksell, Melin, & Olsson, 2007).

Quality of Life

Surprisingly, neither the AT nor the ACT group experienced statistically significant changes or meaningful mean score changes in measures related to quality of life at post-treatment. Both groups did, however, report later increases in mean scores,

with the highest mean in general and in work-specific quality of life at the second follow-up. Other studies of ACT have also indicated changes in quality of life pre-treatment to follow-up (Dalrymple & Herbert, 2007; Forman, Herbert, & Moitra, 2007).

These findings, along with the observation that work-related quality of life in neither the ACT nor the AT group correlated with any T3 process variable, suggest that changes in quality of life measures may require more time than other outcomes to become evident after an intervention. This was also suggested by findings from a study of ACT for epilepsy, in which improvement in overall quality of life was not found until the 6-month follow-up, and showed large and significant changes by the 1-year follow-up (Lundgren, 2004, as cited in Hayes et al., 2006). The current finding also indicates that the values clarification is not necessary for such changes, as the AT group also experienced this improvement in quality of life at the follow-up.

Work Attitudes

Contrary to expectations, neither treatment group experienced statistically significant changes nor meaningful mean score changes on measures related to work motivation, meaning, involvement, or satisfaction at post-treatment. This is, however, in line with null findings for job motivation and satisfaction in previous research on ACT for workplace stress (Bond & Bunce, 2000) and on individual stress management interventions in general (Bunce, 1997; Murphy, 1996; Van der Klink, et al., 2001).

Of note, however, is the finding that participants in the present study did report meaningful improvements in job satisfaction at the second follow-up, with a medium sized effect for participants in AT and a large sized effect for participants in ACT participants. As for quality of life, which also involves a rating of satisfaction, perhaps

changes in job satisfaction also require greater time to become evident than other treatment outcomes as participants learn to engage in different behaviors over time.

Discussion of Specific Findings for Process Measures

Locus of Control

Unexpectedly, neither the AT nor the ACT group experienced significant changes in work locus of control at post-treatment. However, participants in ACT, but not AT, experienced a meaningful improvement, medium in magnitude of effect, at the first follow-up. Consistent with the second hypothesis, participants in the ACT group reported higher mean change scores than participants in AT at post-treatment and each follow-up.

Higher scores in this process variable at the first follow-up were predictive of lower frequency of job stressors at the second follow-up for participants in the ACT group. Given that individuals with an internal locus of control believe that what happens to them is within their influence, rather than due to others, fate, or circumstance, (Rotter, 1966), their perception of what is a stressor may differ from that of individual with an external locus or they may resolve stressors and potential stressor with more ease, thus reducing their frequency. Furthermore, research has shown that locus of control, as well as negative affectivity, have the potential to bias, or distort, individual's self-reports on a wide range of variables, from work characteristics (e.g., job control) to well-being (e.g., mental health, job satisfaction) to coping behaviors (e.g., problem- or emotion-focused coping; Parkes, 1991; Siu, Spector, Cooper, Lu, & Yu, 2002; Spector, 1986).

Although work locus of control did have associations in the predicted direction to a high degree with lower depression and to a medium extent with general distress, interference with social functioning, and job satisfaction, these were not statistically

significant, as previous investigations have found. Specific to workplace stress, Bond and Bunce (2003) found that individuals with a lower work locus of control at one assessment experienced worse mental health at a subsequent time. Occupational health researchers have also shown that individuals with an internal locus of control suffer from fewer stress symptoms, mental ill-health and poor functioning, as they are more likely to define stressors as controllable and take proactive steps to cope with them (Gatchel, 1980; Hurrell & Murphy, 1991; Newton & Keenan, 1990; Rotter, 1966; Spector, 1986; Spector, 1988).

Affect

The process variable of negative affect decreased meaningfully for participants in the ACT group at post-treatment and maintained at the first follow-up. Participants in AT did not experience a meaningful improvement until the first follow-up, but it was in fact greater in effect size (large) than that of the ACT group (medium). Neither group had any meaningful changes in positive affect at any assessment.

Lower negative affect at the first follow-up predicted lower frequency of life stressors, impact of life stressors, and general distress for the ACT group, and depression for participants in the AT group at the second follow-up. Research has found that individuals high in negative affectivity are more likely to report stress symptoms (Brief & Roberson, 1989; DeNeve & Cooper, 1998; Moyle, 1995; Parkes, 1990) and greater negative affectivity at Time 1 predicted greater levels of mental ill-health at Time 2 in the study by Bond and Bunce (2003).

For participants in the ACT group, but not for those in AT, trait anxiety decreased meaningfully at post-treatment, maintained this gain at the first follow-up, and then

decreased again at the second follow-up, with a large between group effect size at this assessment. This suggests that one function values clarification may play is changing more generalized and chronic anxiety, in addition to more immediate anxious states. This is in line with the role values play in self-regulation (Baumeister, Heatherton, & Tice, 1994; Martin & Tesser, 1996; Oxford et al., 2002) and choice of coping strategy (Kelly & Stone, 1987; Post & Weddington, 1997), and that goals mediate the effects of personality traits on performance (Locke, 1997). Lower trait anxiety at the first follow-up did not, however, predict any outcome for participants in ACT at the second to a statistically significant degree, and perhaps may be better characterized as an outcome, rather than a process, variable.

Cognition

Although no measures of automatic thinking changed to a statistically significant degree at post-treatment for either group, frequency of negative automatic thoughts decreased consistently for each group through the second follow-up, with medium sized differences between mean pre-treatment and first and second follow-up scores. At each follow-up, participants in both the AT and the ACT group reported meaningful reductions in belief in negative thoughts. Interestingly, frequency of positive thoughts decreased meaningfully for participants in ACT at the first and second follow-ups and no meaningful changes occurred in belief of positive thoughts for either group.

The present study thus adds to previous findings indicating that an acceptance-based intervention, with or without values clarification, may not only initially change how individuals relate to their thoughts but also that, in the long term, may result in changes to thought content as well. Reductions in frequency and believability of negative

automatic thoughts were found at post-treatment and 2 –month follow-up in one study of cognitive distancing, the early form of ACT that did not contain values components (Zettle & Hayes, 1986). One of the recent studies of ACT in the workplace (Flaxman & Bond, in preparation) also showed significant reductions in frequency of dysfunctional cognitions (especially between baseline and 6 month follow-up).

Although lower frequency of negative thoughts was not associated with the observed large improvement in general mental health in the Flaxman and Bond study (in preparation), the present research indicated that this process variable did predict lower frequency of life stressors as well as lower depression (even after the association with negative affect was controlled for) in participants of the AT group. At T4, lower frequency of negative thoughts associated significantly with lower state anxiety for the AT group, as did higher frequency of positive thoughts with higher work-related quality of life for the ACT group.

The T3 reduction in belief in negative thoughts, an indication of cognitive defusion, was not found to significantly predict any outcome for either group at T4, although it did have high correlations with frequency and impact of life stressors for participants in ACT. Cognitive defusion scores have been found to mediate the decrease in depression scores at post-intervention and at follow-up for cognitive distancing (Zettle & Hayes, 1986), as well as for ACT's effects on other study-specific outcomes (Gaudiano and Herbert (2006a, 2006b; Hayes, Wilson, et al., 2004). The positive relationship between work-related QoL and belief in negative thoughts at T4 for participants in AT was surprising and not easily explained.

Mindfulness

Surprisingly, participants in both groups did not report significant median changes or meaningful mean changes post-treatment or at any follow-up in psychological flexibility or its subscale of Willingness. This is contrary to numerous studies of ACT in which psychological flexibility improved and was correlated or mediated mental health, affect, cognitive, and behavioral outcomes in clinical trials and non-intervention laboratory-based research (see Hayes et al., 2006 for one review; Dalrymple & Herbert, 2007; Forman, Herbert, & Moitra, 2007; Lloyd & Hastings, 2008). Specific to work stress, high levels of psychological flexibility have been found to predict better performance and increase the association between job control and better mental health and performance over time (Bond & Bunce, 2003; Bond & Flaxman, 2006). It also correlates, to a greater degree than actual pain ratings, with less disability, better work status, more daily “up” time, less use of analgesics, and fewer health-care related visits in patients with chronic pain (McCracken, 1998; McCracken, Vowles, & Eccleston, 2004).

The current lack of findings in terms of meaningful change in psychological flexibility may be simply due to lack of adequate sample size, as both groups did evidence a minimal increase in the AAQ at post-treatment and the second follow-up. The lack of findings with respect to mediation by the AAQ may be due to several factors. For one, other measures, particularly negative affect, automatic thinking, and the FFMQ and its subscales, that emerged as significant mediators were not controlled for in analyzing the association between the AAQ and outcomes. In addition, the possibility that the AAQ would mediate the effects of these measures on program outcomes was not examined.

Such underlying or indirect relationships involving the AAQ have been suggested. Bond and Bunce (2003) showed that psychological flexibility increased the association between job control and better mental health over time (Bond & Bunce, 2003), while other researchers (Kashdan, Barrios, Forsyth, & Steger, 2006) recently demonstrated that the AAQ partially mediated the effects of maladaptive coping, emotional response styles, and controllability on anxiety ratings and completely mediated the effects of two emotion regulation strategies (i.e., suppression and reappraisal) on daily negative and positive experiences. Experiential avoidance (as assessed by coding the AAQ so that higher scores reflect the opposite of psychological flexibility or acceptance) was also associated with diminished daily positive affective experiences and healthy life appraisals, diminished frequency of positive events and more frequent negative life events, and greater negative affective experiences.

Only one existing study of ACT was located that used a measure of mindfulness, the Kentucky Inventory of Mindfulness Skills (KIMS, Baer, Smith, & Allen, 2004) and found significant changes in the Acceptance and the Acting with Awareness subscales (Forman, Herbert, & Moitra, 2007). The findings of the present investigation indicated that participants in the ACT group, but not those in AT, reported a marginally significant increase in overall mindfulness at post-treatment, with a medium-sized mean difference for this measure and for the Acting with Awareness subscale. The ACT group maintained these post-treatment gains at each follow-up and also reported a medium sized mean increase in the Nonreactivity subscale at the first follow-up, while the AT group indicated decreases. Participants in AT experienced no meaningful improvements

on any subscale and actually indicated a decrease in the Nonreactivity and Acting with Awareness subscales at post-treatment and follow-up.

The lack of change in the FFMQ for participants in the AT group may be conjectured due to various reasons. For one, perhaps the particular sample in the AT group was simply too small to detect any meaningful changes. Second, perhaps the additional two sessions was a critical ingredient in affecting a measurable change in mindfulness, either through greater continued practice of skills, or greater use of other acceptance and stress management strategies, as was observed for the ACT participants. Third is the possibility that perhaps the first four components of ACT may not be truly sufficient to effect changes in measures of mindfulness as operationalized by approaches based on meditation, such as MBSR. As noted, most previous studies of ACT have not examined effects on mindfulness measures. As such, the values components of ACT may perhaps be necessary in order for changes in constructs reflected in the FFMQ, particularly Nonreactivity to Inner Experience and Acting with Awareness, to emerge. Why a concomitant change in the Willingness subscale of the AAQ for participants in ACT was not found, however, is not clear. In a post-hoc analysis, the AAQ Willingness scale was found to correlate significantly and highly with FFMQ at T4 for participants in AT [$\tau = 0.80, p < 0.05$] but not for participants in ACT [$\tau = .07, p = ns$], suggesting that the measures were in fact tapping into a similar construct.

With respect to possible mediation, mindfulness at the first follow-up correlated over time with a number of outcomes at the second follow-up for participants in ACT, thus speaking to its significance. Specifically, higher overall mindfulness predicted lower depression, while higher scores on the Acting with Awareness subscale predicted lower

job stressor frequency and lower interference in social functioning due to mental or physical problems. The Acting with Awareness subscale of the KIMS was found to mediate changes in mental health, functioning, and quality of life outcomes in a recent study (Forman, Herbert, & Moitra, 2007). Higher scores on the Nonreactivity to Inner Experience subscale predicted lower frequency of life stressors and lower impact of life stressors, even after controlling for the effect of negative affect for both. In addition to these outcomes, the Nonreactivity subscale also predicted lower state anxiety, lower general distress, and higher overall quality of life. The Nonreactivity to Inner Experience subscale has been suggested as a useful way of operationalizing acceptance and found to high correlate negatively and highly with experiential avoidance, with only the correlation with Nonjudging being greater, by the developers of the FFMQ (Baer et al., 2006).

Values-based Behavior

Meaningful mean change scores on the Action subscale of psychological flexibility, a proposed measure of ability to take action (towards responsibilities, important tasks, success, resolving a problem, and a life course) even in the face of unwanted internal events, occurred for both groups, though at post-treatment for the ACT group and at the second follow-up for the AT group. Although values are not explicit within this construct, they are implicit in the wording of the items (e.g., being able to “do something important”, “take action on a problem”, “take care of my responsibilities”, and “set a course in my life”).

With respect to our correlational analyses, the positive correlation at T4 between frequency of job stressors and the Action subscale of the AAQ is counter to expectations,

particularly as both measures changed in the predicted direction pre-treatment to T4. It may be that for these study participants, the more they pursued a valued but perhaps difficult goal, the more challenges and thus stressors they experienced, particularly if their work environment was not supportive of those goals in terms of resources and colleagues.

No meaningful pre- to post-treatment changes were evident for either group on any coping-related values measures. Interestingly, although AT participants reported marginally significant decreases in the large effect size range in value placed on avoidance coping at the first and second follow-up and a medium improvement in use of avoidance coping at the second follow-up, ACT participants reported medium sized mean decreases in engagement in avoidance coping and increases in engagement in approach coping at the first and second follow-up. These findings suggest that changes to value-related outcomes and coping behavior require time.

The findings also suggest that, although intentions may have changed for participants in AT and less avoidance behavior was evident later in time, the value components may be crucial for initiation of adaptive coping behaviors to a meaningful extent, in addition to decreases of maladaptive ones, and in a shorter time frame, and with little need to address intentions at all (engagement in the different coping approaches changed either without or before an concomitant change in value placed on them). As such, the values components may assist individuals in initiating structured behavioral goal planning and encourage quicker follow-through.

As stated in the introduction, the setting of goals have been an integral construct within theories of self-regulation (e.g., Baumeister, Heatherton, & Tice, 1994; Martin &

Tesser, 1996), motivation (e.g., expectancy-value theory; Atkinson, 1964), and behavioral task performance and commitment (e.g., Goal-Setting Theory; Lock & Latham, 1990; Value-Affirmation; Lydon & Zanna, 1990). This does not preclude the possibility, proposed by Hayes and colleagues, that the mindfulness components aided participants in maintaining behavioral commitment to goals and thus bolstered the effects of values clarification (Hayes et al., 1999; Hayes et al., 2006).

Lower engagement in avoidance coping at the first follow-up predicted lower job stressor frequency, lower physical ill health, and higher job satisfaction at the second follow-up for participants of ACT. This is in line with the two existing studies on ACT that examined coping-specific behavior. One found that reductions in the Mental Disengagement subscale of the COPE mediated the reduction in distress in cancer patients (Branstetter et al., 2004, as cited in Hayes et al., 2006), while the other indicated that avoidance coping was positively cross-sectionally associated with depression (Lloyd & Hastings, 2008). Passive or avoidance-based coping has generally been found to result in greater psychological stress and negative emotional states (Folkman & Lazarus, 1988a, 1988b).

These findings may also relate to the proposition that coping itself leads to many changes within the stress process because it plays a significant role in the appraisal process by providing new information that feeds back to the individual and alters subsequent appraisal, which is always the proximal cause of reactions to stressors (Lazarus, 1995). Moreover, attending to values has been shown to impact appraisals of meaning of stressful situations (e.g., Cooke & Rousseau, 1983), including work-related stress (e.g., Bocchino, Hartman, & Foley, 2003; Britt, Stetz, & Bliese, 2004; Carlson &

Kaemar, 2000), and to dampen the physiological reactions to stress (e.g., Creswell et al., 2005).

There was also a positive association of T4 value placed on approach coping with work-related QoL in the ACT group. Such setting of intentions may have resulted in cognitive/affective changes that were not examined or did not emerge with respect to their relationship with work-quality of life in this study. Personal values clarification plays a significant role within theories of work-related motivation (e.g., Latham & Pinder, 2005) satisfaction, commitment, and motivation (e.g., Butler, 1983; Jans, 1989; Knoop, 1994; Latham & Pinder, 2005; Robey, 1974). Research has indicated that simply giving attention to personal values, as the ACT but not the AT group did, has in itself been found to affect the strategies used to deal with stressful situations (e.g., Kelly & Stone, 1987; Post & Weddington, 1997) and to increase engagement in healthy and decrease engagement in unhealthy behaviors (Kristiansen, 1986; Oxford et al., 2002).

Participants in AT experienced a medium sized improvement in approach coping congruence at post-treatment, while those in ACT did not report such an improvement until the first follow-up. Although both groups reported medium sized mean improvements in overall values-to-action congruence at the first follow-up, it is not known whether this increased congruence for the AT group was due to changes in value or in action and in what specific approaches.

Higher overall coping congruence at the first follow-up was associated with lower frequency and impact of life stressors and higher job satisfaction in the AT group. Although this is consistent with the suggestion that the open, intentional awareness cultivated by mindfulness may by itself lead individuals to act in ways that are more

congruent with their values and interests (e.g., Brown & Ryan, 2003; Ryan, Kuhl, & Deci, 1997; Shapiro et al., 2006) and the AT group did evidence a decrease in value placed on avoidance coping, the finding that participants in the AT group did not report meaningful changes in measures of mindfulness indicates that “intentional awareness” is unlikely to be the source of the relationship between congruence and outcomes for the AT group.

Surprisingly, lower value placed on avoidance coping was associated with higher general distress in participants of the AT group. It may be that this was simply a spurious association, or that even though participants recognized avoidance coping maladaptive (value did decrease at the follow-ups), they either continued to engage in it (use of avoidance coping was higher at the first follow-up than at pre-treatment or post-treatment), thus encouraging continued distress. This latter possibility is actually in line with the positive association at T4 between job stressor impact and value placed on and use of avoidance coping for participants in AT.

Study Strengths

The present investigation had several strengths and addressed several limitations of the existing literature on ACT for workplace stress and in general. In attempting to achieve its aims, it is the only investigation of ACT to date that utilized a dismantling methodology. This design also allowed for the examination of the effects of the mindfulness components of ACT as a stand-alone intervention. To maximize internal validity, the study involved the development and administration of a manualized protocol, highly structured in format and content. Moreover, the interventions were not identified to the participants by the therapy name and the identical rationale was provided

for each version. Manual adherence assessment by blind raters indicated high adherence to inclusion and manner of administration of all ACT components, as well as high adherence to the therapeutic stance of ACT in intervention provision. Intervention components in each version of the program were equitable and discrimination between the versions was attained to an optimal degree, thus increasing confidence in the assertion that any differences in effects between the groups were related to the omission of the values components.

In data collection, the study expanded significantly beyond existing studies of ACT. With respect to duration of assessment, three follow-up times were included, allowing for greater longitudinal evaluation of program effects. In terms of data collected, an extensive variety of outcome measures was utilized, including those of non-work-related stressors, coping, quality of life, and work outcomes. In addition, numerous possible mediating factors beyond that of psychological flexibility were examined. The study went beyond existing ACT research in assessing mindfulness by examining not only the total AAQ and the Willingness subscale of the AAQ, but also the comprehensive Five Facet Mindfulness Scale and its five subscales. In attempting to assess values-to-behavior congruence, the study not only used the Action subscale of the AAQ, but a newly devised measure related to coping behavior that specifically tapped the concepts of approach and avoidance that significantly defines the ACT theoretical and clinical framework.

In addition to these outcome and process measures, the study also examined participants' extent of therapy skills practice at each intervention session, after program completion, and at the follow-ups, and in this assessment was included measurement of

use of non-program stress management approaches. Findings from this monitoring during the program indicated that participants practiced a majority of the skills and indicated that they experienced a high degree of benefit in terms of aims each exercise was to achieve, further supporting findings of high treatment integrity.

Assessment of participants' expectations for treatment and the extent to which these were met was also a valuable endeavor of this investigation and an infrequent occurrence in clinical outcome research. This assessment not only showed that participants in the ACT and AT groups did not differ in their expectations for treatment and that both groups expected the intervention to have "some" positive effect on their well-being, it indicated that the intervention met or exceeded expectations for both groups post-program in terms of reduction in work-related and non-work stressors and increase in work and life satisfaction. Other measures of participants' evaluation of the intervention also spoke to the finding that the program was well-received by participants, including positive evaluation of the frequency of sessions, high satisfaction with the facilitator, and zero attrition of participants during intervention administration.

With respect to the make-up of study participants, homogeneity was significant due to all individuals being employed at the same workplace, holding positions in either administrative or academic areas, reporting similar levels of work control, residing at the same geographic location, and being nearly all female.

Limitations and Ideas for Future Research

In addition to its significant strengths, the present investigation is marked by several limitations that influence implications of its findings and offer opportunities for methodological improvement in future research. The most significant limitation of this

study is the very small sample size. The sample precluded planned analyses and renders the statistical significance of utilized approaches suspect. Differences between the two intervention groups may not have been evident due to a lack of an adequate number of participants. Sample size further decreased as participants failed to respond to requests for assessments at follow-up, which compromises the validity of comparisons of outcomes between assessments in which samples vary. In addition, the number of analyses performed with the Mann-Whitney and Wilcoxon tests likely increased the chances of Type II error.

Although statistical significance testing was supplemented with effect size analyses in to evaluate program effectiveness, future dismantling studies of ACT would benefit from sample sizes that allow for traditional parametric statistical analyses that allowed investigators to assess repeated-measures and, with large samples, pursue mediational analysis to investigate possible factors that drive ACT's effects. Such mediational analyses, as well as approaches such as structural equation modeling, offer additional avenues to ascertain the differential effects of ACT's components.

Various factors may have accounted for the low recruitment. One concerns the fact that individuals who expressed initial interest from viewing the paper or emailed flyer were sent detailed information about the study prior to any face-to-face meeting. This procedure was chosen to increase the chances that enrolled participants were truly committed and undoubtedly contributing to the 100% retention across intervention sessions. However, it may have also deterred or overwhelmed others who were initially less committed. The two-hour length and number of intervention sessions were also likely influences on recruitment.

The choice of clinical focus, work stress, is another factor that may have contributed to poor enrollment and may not have been the optimal choice for an initial dismantling study of ACT. Work stress, unlike depression or anxiety, is seen by many workers as an unavoidable and “normal” experience and more related to organizational factors outside of a person’s control. The experience of work stress for many individuals may not be adequately captured by measures of psychological distress, such as depression or anxiety. Low-level yet recurrent strain from work-related stressors may instead manifest as functional interference in performance, attitudes, and relationships with coworkers and the organization (Goodspeed & DeLucia, 1990; Levi, 1996; Sutherland & Cooper, 1990). This phenomenon could have led to less significant changes on outcomes in the current study than may have been seen with a sample reporting more significant levels of strain. Thus, future studies of work stress and ACT may want to assess the level of concern or impact participants experience from work stressors and limit inclusion criteria to samples reporting significant distress. In addition and based on anecdotal reports from individuals who inquired but did not consent for the study, many individual under work stress perceive making time for an intervention program as an additional stressor. If their level of concern is not significant, they may be less reluctant to participate in an intervention program. Thus, researchers of future dismantling studies may want to focus on issues such as depression, anxiety, or weight loss, which individuals may have more motivation to address.

A significant issue with respect to choosing an appropriate methodology to investigate ACT is whether ACT as an intervention can be dismantled without diminishing its theoretical and therapeutic framework. Each of the six components in

ACT is conceptualized as a skill that builds on and interacts with the others within a “hexaflex” model of therapeutic change (Hayes et al., 2006). Within ACT treatment protocols, the mindfulness components are taught not as stand alone interventions but with the aim of enabling individual to overcome the cognitive and emotional barriers to values-based action (e.g., Eifert & Forsyth, 2005). Such interactive and dependent relationships between the components also encourage dynamic and flexible administration. Thus, breaking apart these connections may arguably be counter to the stance and aims of ACT.

Although a dismantling design is arguably the highest standard of research methodology for assessing differential and additive effects of components in a multi-component treatment, it may be advisable to utilize other approaches as an initial strategy to ascertain similar aims and to investigate the processes underling ACT’s components without breaking apart the interplay among them. These approaches include path analysis, structural equation modeling, and hierarchical analysis. Hierarchical regression models that test the additive contribution of values clarification in accounting for variance in outcomes beyond that of mindfulness could be useful in examining mechanisms of ACT following the provision of the complete protocol. Alternatively, path analyses could compare the fit of predictor-outcome models with the fit of predictor-mediator-outcome models with cross-sectional or longitudinal data of substantial sample size. Such methodologies avert the resource, time, and recruitment challenges inherent in clinical trials and may serve to actually inform subsequent dismantling investigations as to the most appropriate and efficient procedural and assessment protocols.

Limitations with respect to administration of the treatment in the present study are also evident. The fact that the two interventions had a different number of sessions leaves open the possibility that any differences in effects between the groups were in fact related to length of participation rather than the presence or absence of specific components of the intervention. Groups within each intervention were also only 3 participants or less in size. Thus, results may not be generalizable to investigations that utilize larger groups or individual treatment. In addition, due to limited resources, the study intervention was both facilitated and researched by the same individual and the principal investigator of the study. Although this reduces potential effects from use of numerous facilitators, it is recognized that it introduces issues of bias, which cannot be fully resolved. Furthermore, although the lead facilitator was not unpracticed in ACT, she had not administered the intervention in a group format prior to the study and her level of ACT experience was not expert in nature. The observation by session raters that the facilitators explained metaphors to participants rather than having the group verbalize them out may have reflected this level of experience. Explaining metaphors may have reduced the impact or retention of concepts underlying therapeutic metaphors, thus lessening treatment effectiveness. Future dismantling investigations ought to involve seasoned expert clinicians of ACT.

With respect to the sample, this study used groups of self-referred individuals, whose noted homogeneity limits generalizability of findings to more diverse less educated populations employed in blue-collar or manual work. Future dismantling research will benefit from larger and more diverse cohorts of participants to ensure a

statistically significant sample size and greater applicability of findings outside of study participants.

In the domain of data collection, the extensive amount of assessments, which participants anecdotally reported required an average 90 minutes to complete, may have led to responding that was nonchalant, hurried, or, more generally, not mindful.

Although most participants welcomed the opportunity to use online survey assessment, it is worthwhile to note that 4 of the 16 participants chose paper packets for completion of measures. Thus, future research would be well served by offering both approaches to participants. In addition, although the intervention was administered in such a manner that each session represented a unique component of ACT, this study did not capitalize on the opportunity to investigate component-specific effects via assessment of outcomes at each session. Furthermore, the novel measure of value-to-action congruence requires further refinement and psychometric improvement

Lastly, in order to ease examination of the relationship between extent of skills practice and outcomes, it would have been beneficial to provide participants with specific options in reporting their practice. The use of an open-ended format in this study led participants to often omit information on extent of practice, provide estimates (e.g., 2 to 3), or use varied metrics (e.g., number of practices during the week, minutes practiced), which precluded analyses.

Summary and Conclusions

The present study represents an initial investigation utilizing a dismantling design to explore the effects of a complete version of Acceptance and Commitment Therapy for work stress with a version that omitted the values-based components. Expanding beyond

existing studies of ACT, a broad range of mental, physical health, functioning, quality of life, and work-related outcomes were examined pre-treatment, post-treatment, and at three follow-up assessments. Various factors proposed to possibly mediate changes in outcomes for each version of the intervention, in addition to various therapy process measures, were also examined.

Due to a small sample size of 8 participants per intervention version, analyses involved nonparametric between- and within-group comparison tests, biserial correlation rather than mediation analyses, and examination of magnitudes of effect size of between- and within-group mean score differences. Findings are preliminary and generalizability to other populations, clinical outcomes, and ACT-based programs is limited. Results do, however, suggest that the intervention was well received by participants and administered with high fidelity to the ACT framework and therapeutic stance and with excellent discrimination between the two versions in terms of components included.

Study findings indicated that participants in the complete ACT group experienced meaningful changes in a greater number of outcomes and process variables than did participants in the AT group. There were no statistically significant differences between the AT and ACT groups at post-treatment or other assessment for any measure of stress, mental or physical health, quality of life, affect or cognition, or mindfulness. Contrary to expectations, findings generally supported greater improvement in follow-up outcome scores for participants in the AT group, while maintenance of post-treatment gains was the case for participants in ACT.

Unexpectedly, meaningful decreases in frequency of job stressors were observed for both AT and ACT groups pre-treatment through the follow-up assessments, possibly

due to a redefining of the meaning of stressor by participants. Interestingly, though AT appeared to be more effective for job stress, participants in ACT experienced greater improvement in life stressor impact post-treatment and at the first follow-up compared with the AT group. In addition, the current findings on mental health outcomes and magnitude of effects for AT and ACT are consistent with past research showing improvements in depression, anxiety, and general distress. Participants in both groups also experienced meaningful improvements in job satisfaction, as well as work and general quality of life, at the second follow-up. These findings suggest that outcomes involving ratings of satisfaction do not appear to be depend on explicit inclusion of values clarification but may require a greater time to become evident than other treatment outcomes.

Looking across all measures, effect sizes for differences between the AT and ACT groups on mean scores across measures were generally small and few significant median differences between the AT and ACT groups were observed. However, certain differences between the groups emerged. Large group differences favored the ACT group and occurred for the measure of interference in social activities by physical health or emotional problems and job motivation. Participants in ACT also reported being significantly less likely than those in the AT group to not do work or other activities as carefully as usual due to emotional problems at post-treatment. In addition, participants in ACT, but not AT, experienced meaningful improvements in work locus of control and trait anxiety, suggesting that one function values clarification may play is changing more generalized attitudes and engrained response styles.

Surprisingly, participants in neither ACT nor AT reported meaningful changes in psychological flexibility or its subscale of Willingness. This may have been simply due to lack of adequate sample size, as both groups did evidence a minimal increase in the AAQ at post-treatment and the second follow-up. Moreover, it appears that the first four components of ACT are sufficient to bring about changes in certain facets of mindfulness, such as cognitive defusion, since frequency of and belief in negative automatic thoughts decreased for each group pre-treatment to follow-up and predicted outcomes for the AT group.

However, not all aspects of mindfulness were affected by the AT intervention. Only participants in ACT experienced improvement in the FFMQ and its subscales. Also for this group, higher overall mindfulness predicted lower depression, while higher scores on the Acting with Awareness subscale predicted lower job stressor frequency and lower interference in social functioning due to mental or physical problems. Moreover, higher scores on the Nonreactivity to Inner Experience FFMQ subscale predicted lower frequency of life stressors, lower impact of life stressors, lower state anxiety, lower general distress, and higher overall quality of life. Whether mindfulness as defined with non-ACT interventions is in fact embodied within ACT and how it differs from psychological flexibility remains to be investigated in future studies.

Findings that changes in value placed on and use of avoidance coping for participants in AT and decreases in engagement in avoidance coping and increases in engagement in approach coping for ACT participants did not occur until follow-up suggest that impact on value-related outcomes and coping behavior require time. The findings also suggest that, although intentions may have changed for participants in AT

and less avoidance behavior was evident later in time, the value components may be crucial for initiation of adaptive coping behaviors, in addition to decreases of maladaptive ones and with little need to address intentions. As such, the values components may assist individuals in initiating structured behavioral goal planning, increase motivation, and encourage quicker follow-through. This is also suggested by the findings that meaningful change on the Action subscale of psychological flexibility occurred at post-treatment for the ACT group, but not until the second follow-up for the AT group, and that participants in ACT engaged in a greater variety of acceptance and stress management approaches and techniques than participants in AT.

Future research studies using larger sample sizes are needed to elucidate the validity and generalizability of these preliminary findings. Such research holds promise of greater understanding of the effects and mechanisms of ACT in its entirety, the particular roles of its components and their synergistic relationships, and how ACT relates to other third-wave approaches in theory and practice.

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APPENDICES

APPENDIX A

Valued Coping in Action Questionnaire, Values (VCAQ-V) and Action (VCAQ-A)

VCAQ-V

INSTRUCTIONS: Below you will find a list of some of the ways that individuals react to difficult or stressful situations. Please indicate to what extent, you find each of the following coping reactions to stress as a good thing, as something to strive for in your own behavior. We would like to know how positively you think of each reaction, your honest opinion, and NOT the extent you yourself react to stress in these ways. Please use the following scale to respond:

Not a good response at all	A not-so-good response	Neither good nor bad	A good response	A very good response
1	2	3	4	5

- ___ 1. Try to grow as a person as a result of the experience.
- ___ 2. Turn to work or other substitute activities to take your mind off things.
- ___ 3. Get upset and letting your emotions out.
- ___ 4. Try to get advice from someone about what to do.
- ___ 5. Concentrate your effort on doing something about it.
- ___ 6. Say to yourself “this isn’t real”.
- ___ 7. Put your trust in God.
- ___ 8. Laugh about the situation.

- ___ 9. Admit to yourself that you can't deal with it, and quit trying.
- ___ 10. Restrain yourself from doing anything too quickly.
- ___ 11. Discuss your feelings with someone.
- ___ 12. Use alcohol or drugs to make yourself feel better.
- ___ 13. Get used to the idea that it happened.
- ___ 14. Talk to someone to find out more about the situation.
- ___ 15. Keep yourself from getting distracted by other thoughts or activities.
- ___ 16. Daydream about things other than the situation.
- ___ 17. Get upset, and be really aware of it.
- ___ 18. Seek God's help.
- ___ 19. Make a plan of action.
- ___ 20. Make jokes about the situation.
- ___ 21. Accept that the situation has happened and that it can't be changed.
- ___ 22. Hold off doing anything about it until the situation permit.
- ___ 23. Try to get emotional support from friends or relatives.
- ___ 24. Just give up trying to reach your goal.
- ___ 25. Take additional actions to try to get rid of the problem.
- ___ 26. Try to lose yourself for awhile by drinking alcohol or take drugs.
- ___ 27. Refuse to believe that it has happened.
- ___ 28. Let your feelings out.
- ___ 29. Try to see it in a different light, to make it seem more positive.
- ___ 30. Talk to someone who could do something concrete about the problem.
- ___ 31. Sleep more than usual.

- ___ 32. Try to come up with a strategy about what to do.
- ___ 33. Focus on dealing with this problem, and if necessary let other things slide a little.
- ___ 34. Try to get sympathy and understanding from someone.
- ___ 35. Drink alcohol or take drugs, in order to think about it less.
- ___ 36. Kid around about it.
- ___ 37. Give up the attempt to get what you want.
- ___ 38. Look for something good in what is happening.
- ___ 39. Think about how you might best handle the problem.
- ___ 40. Pretend that the situation hasn't really happened.
- ___ 41. Make sure not to make matters worse by acting too soon.
- ___ 42. Try hard to prevent other things from interfering with your efforts at dealing with this.
- ___ 43. Go to movies or watch TV, to think about it less.
- ___ 44. Accept the reality of the fact that it happened.
- ___ 45. Ask people who have had similar experiences what they did.
- ___ 46. Feel a lot of emotional distress and find yourself expressing those feelings a lot.
- ___ 47. Take direct action to get around the problem.
- ___ 48. Try to find comfort in your religion.
- ___ 49. Force yourself to wait for the right time to do something.
- ___ 50. Make fun of the situation.
- ___ 51. Reduce the amount of effort you're putting into solving the problem.
- ___ 52. Talk to someone about how you feel.
- ___ 53. Use alcohol or drugs to help get through it.

- ___ 54. Learn to live with it.
- ___ 55. Put aside other activities in order to concentrate on this.
- ___ 56. Think hard about what steps to take.
- ___ 57. Act as though it hasn't even happened.
- ___ 58. Do what has to be done, one step at a time.
- ___ 59. Learn something form the experience.
- ___ 60. Pray more than usual.

VCAQ - A

INSTRUCTIONS: Please take a moment to think about what you have generally done and felt when experiencing difficult or stressful situations at work in the past few weeks.

Now, indicate to what extent you generally engaged in the following behaviors in your response to the situation. Please be honest. There are no right or wrong answers.

Please use the following rating scale to respond to each item:

I did this	I did this	I did this	I did this	I did this
Not at all	A little bit	Somewhat	Quite a bit	A lot
1	2	3	4	5

- ___ 1. I took direct action to get around the problem.
- ___ 2. I tried to find comfort in my religion.
- ___ 3. I acted as though it hadn't even happened.
- ___ 4. I did what had to be done, one step at a time.
- ___ 5. I tried to grow as a person as a result of the experience.
- ___ 6. I turned to work or other substitute activities to take my mind off things.
- ___ 7. I accepted that the situation had happened and that it couldn't be changed.
- ___ 8. I held off doing anything about it until the situation permitted.
- ___ 9. I slept more than usual.
- ___ 10. I tried to come up with a strategy about what to do.
- ___ 11. I made sure not to make matters worse by acting too soon.

- ___ 12. I tried hard to prevent other things from interfering with my efforts at dealing with it.
- ___ 13. I reduced the amount of effort I put into solving the problem.
- ___ 14. I talked to someone about how I felt.
- ___ 15. I got upset and let my emotions out.
- ___ 16. I tried to get advice from someone about what to do.
- ___ 17. I got used to the idea that it happened.
- ___ 18. I talked to someone to find out more about the situation.
- ___ 19. I tried to get emotional support from friends or relatives.
- ___ 20. I just gave up trying to reach my goal.
- ___ 21. I focused on dealing with the problem, and if necessary let other things slide a little.
- ___ 22. I tried to get sympathy and understanding from someone.
- ___ 23. I went to movies or watched TV, to think about it less.
- ___ 24. I discussed my feelings with someone.
- ___ 25. I used alcohol or drugs to make myself feel better.
- ___ 26. I accept the reality of the fact that it happened.
- ___ 39. I got upset, and was really aware of it.
- ___ 40. I sought God's help.
- ___ 41. I refused to believe that it had happened.
- ___ 42. I let my feelings out.
- ___ 27. I used alcohol or drugs to help get me through it.
- ___ 28. I learned to live with it.

- ___ 29. I kept myself from getting distracted by other thoughts or activities.
- ___ 30. I daydreamed about things other than the situation.
- ___ 31. I took additional actions to try to get rid of the problem.
- ___ 32. I tried to lose myself for awhile by drinking alcohol or take drugs.
- ___ 45. I made a plan of action.
- ___ 46. I made jokes about the situation.
- ___ 50. I restrained myself from doing anything too quickly.
- ___ 51. I tried to see it in a different light, to make it seem more positive.
- ___ 52. I talked to someone who could do something concrete about the problem.
- ___ 53. I thought about how I might best handle the problem.
- ___ 47. I put my trust in God.
- ___ 48. I laughed about the situation.
- ___ 54. I pretended that the situation hadn't really happened.
- ___ 55. I learned something form the experience.
- ___ 56. I prayed more than usual.
- ___ 33. I drank alcohol or take drugs, in order to think about it less.
- ___ 34. I kidded around about it.
- ___ 35. I asked people who have had similar experiences what they did.
- ___ 36. I felt a lot of emotional distress and found myself expressing those feelings a lot.
- ___ 37. I put aside other activities in order to concentrate on the situation.
- ___ 38. I thought hard about what steps to take.
- ___ 43. I gave up the attempt to get what I wanted.
- ___ 44. I looked for something good in what is happening.

___ 49. I admitted to myself that I couldn't deal with it, and quit trying.

___ 57. I forced myself to wait for the right time to do something.

___ 58. I made fun of the situation.

___ 59. I concentrated my effort on doing something about it.

___ 60. I said to myself "this isn't real".

APPENDIX B

Tables of Median Rank Differences Within and Between Groups

Table B.1.

Median rank differences within and between groups for job stress (JSS) and life stress (SRLE)

	AT					ACT				AT-ACT	
	T	<i>n</i>	<i>Mdn</i>	<i>z</i>	<i>p</i>	<i>n</i>	<i>Mdn</i>	<i>z</i>	<i>p</i>	<i>U</i>	<i>p</i>
JSS-F	1	8	45.00			8	43.00			27.50	.636
	2	8	35.00	-1.76	.079*	8	38.50	-1.68	.092*	26.00	.528
	3	8	25.00	-2.52	.012**	7	40.00	-1.19	.236	27.00	.955
	4	6	32.50	-1.99	.046**	6	33.00	-0.53	.599	17.00	.873
	5	5	34.00	-0.41	.686	3	42.00	-1.60	.109	7.00	.881
JSS-I	1	8	40.50			8	33.50			26.00	.528
	2	8	28.50	-2.24	.025**	8	32.50	-0.63	.528	30.50	.875
	3	8	26.00	-2.10	.036**	7	35.00	-1.01	.310	27.50	.954
	4	6	21.00	-1.99	.046**	6	27.00	-0.31	.753	14.00	.522
	5	5	18.00	-1.21	.225	3	27.00	-1.07	.285	7.00	.881
SRLE-F	1	7	50.00			7	68.00			17.00	.337
	2	7	46.00	-0.73	.463	6	53.50	-1.58	.114	17.00	.568
	3	6	37.00	-1.68	.093*	6	47.50	-1.76	.078*	17.00	.873
	4	5	22.00	-1.75	.080*	5	63.00	-1.75	.080*	6.00	.175
	5	3	25.00	-1.07	.285	3	60.00	-1.07	.285	3.00	.513

Table B.1. Continued

SRLE-I	1	7	42.00			7	61.00			16.00	.276
	2	7	49.00	-1.01	.310	6	54.00	-1.48	.138	16.50	.520
	3	6	37.00	-1.57	.116	6	43.50	-1.75	.080*	16.00	.748
	4	5	25.00	-1.21	.225	5	48.00	-1.75	.080*	6.00	.175
	5	3	18.00	-1.07	.285	3	42.00	-1.60	.109	3.00	.700

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney test statistic.

* $p < .10$, ** $p < .05$.

Table B.2.

Median rank differences within and between treatment groups for depression (JBDI), state anxiety (STAI-S), general distress (GHQ), and general physical ill health (SF-1)

	AT					ACT				AT-ACT	
	T	n	Mdn	z	p	n	Mdn	z	p	U	p
BDI	1	8	19.00			7	14.00			22.00	.485
	2	8	13.00	-1.97	.049**	7	10.00	-1.86	.063*	21.00	.415
	3	6	4.00	-2.20	.028**	6	11.00	-1.83	.068*	11.00	.260
	4	5	4.00	-1.76	.078*	5	4.00	-1.83	.068*	11.50	.834
	5	3	4.00	-1.07	.285	3	12.00	-1.34	.180	4.00	.827
STAI-S	1	8	48.00			8	48.50			30.50	.875
	2	8	40.50	-1.19	.236	8	42.00	-2.03	.043**	32.00	1.00
	3	8	36.50	-2.03	.042**	7	55.00	-0.51	.612	20.50	.384
	4	6	39.50	-1.36	.173	6	38.50	-1.79	.074*	16.50	.810
	5	5	39.00	-0.67	.500	3	45.00	-1.07	.285	6.00	.655
GHQ	1	8	19.50			8	19.50			31.50	.958
	2	8	20.50	-1.41	.158	8	14.50	-1.96	.050**	21.50	.269
	3	8	15.00	-2.53	.011**	7	14.00	-2.21	.027**	27.0	.907
	4	6	14.00	-1.16	.248	6	12.50	-1.57	.116	16.00	.747
	5	5	19.00	-0.73	.465	3	15.00	-1.07	.285	4.00	.297

Table B.2. Continued

SF-1	1	7	3.00			7	3.00			17.00	.313
	2	5	3.00	-1.41	.157	8	2.00	-1.63	.102	14.5	.389
	3	4	2.50	.000	1.00	8	2.00	-1.41	.157	13.5	.632
	4	2	3.00	-1.00	.317	8	1.50	-1.73	.084*	4.500	.338
	5	1	3.00			5	3.00	-1.63	.102	1.50	.480

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

* $p < .10$, ** $p < .05$.

Table B.3.

Median rank differences within and between treatment groups for not doing work or other activities as carefully as usual due to emotional problems (SF-5c), interference in social activities by physical health or emotional problems (SF-6), overall quality of life (QoL), and work quality of life (QoL-W)

	AT					ACT					AT-ACT	
	T	n	Mdn	z	p	n	Mdn	z	p	U	p	
SF-5c	1	7	Y = 2			7	Y = 3			17.00	.833	
	2	5	Y = 4		.625 ⁺	8	Y = 1		.625 ⁺	25.0	.462	
	3	4	Y = 2		1.00 ⁺	8	Y = 1		.625 ⁺	22.0	.487	
	4	2	Y = 1		1.00 ⁺	8	Y = 3		1.00 ⁺	13.00	.422	
	5	1	Y = 1		1.00 ⁺	5	Y = 0		.250 ⁺	7.00	.881	
SF-6	1	7	2.00			7	3.00			17.00	.304	
	2	5	3.00	-1.34	.180	8	1.50	-1.82	.068*	8.00	.062*	
	3	4	2.00	0.00	1.00	8	1.00	-2.07	.038**	7.00	.081*	
	4	2	3.50	-1.41	.157	8	1.00	-1.73	.084	0.50	.035**	
	5	1	3.00			5	2.00	-1.63	.102	0.00	.114	
QoL	1	8	17.00			8	15.00			30.00	.833	
	2	8	15.00	-0.42	.674	8	15.50	-0.70	.483	25.0	.462	
	3	8	22.50	-0.49	.624	7	17.00	-0.68	.498	22.0	.487	
	4	6	39.50	-0.94	.345	6	21.00	-2.02	.043**	13.00	.422	
	5	5	23.00	-0.81	.416	3	8.00	-1.07	.285	7.00	.881	

Table B.3. Continued

QoL-	1	8	-1.00			8	-1.00			27.00	.588
W	2	8	0.50	-1.23	.221	8	-2.00	0.00	1.000	18.50	.149
	3	8	1.00	-0.55	.581	7	0.00	-0.11	.916	20.00	.348
	4	6	1.50	-0.96	.339	6	1.00	-1.84	.066*	12.00	.329
	5	5	1.00	-1.09	.276	3	-2.00	-0.82	.414	7.50	1.000

Note. For SF-5c, Y = number of participants indicating “Yes”. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

+Binomial test, ^Fisher exact test.

* $p < .10$, ** $p < .05$.

Table B.4.

Median rank differences within and between treatment groups for job satisfaction (JSAT), motivation (IJM), meaning (WIS), and importance (HONS)

	AT					ACT				AT-ACT	
	T	n	Mdn	z	p	n	Mdn	z	p	U	p
JSAT	1	8	73.00			8	65.00			24.00	.400
	2	8	73.50	-1.19	.233	8	62.50	0.00	1.000	21.50	.269
	3	8	78.50	-1.36	.175	7	68.00	-0.68	.498	21.00	.418
	4	6	86.50	-1.89	.058*	6	81.00	-1.99	.046**	12.00	.337
	5	5	78.00	-0.14	.892	3	74.00	-0.54	.593	7.00	.881
IJM	1	8	35.00			8	37.50			26.50	.562
	2	8	35.00	-0.59	.553	8	35.00	-0.63	.528	31.50	.958
	3	8	34.50	-1.55	.121	6	36.50	-0.21	.833	11.00	.090*
	4	5	35.00	-0.55	.581	6	36.00	-0.53	.596	8.50	.226
	5	5	36.00	-0.18	.854	3	31.00	0.00	1.000	1.50	.070*
WIS	1	8	29.00			8	29.00			30.50	.874
	2	8	29.00	-0.67	.500	8	31.00	-0.51	.609	26.00	.526
	3	6	31.00	-0.42	.674	7	28.00	-0.34	.733	19.00	.771
	4	5	31.00	-0.68	.496	5	34.00	-0.68	.498	10.00	.599
	5	2	30.00	-1.41	.157	3	24.00	-0.45	.655	2.00	.564

Table B.4. Continued

HONS	1	7	35.00			7	37.00			23.00	.846
	2	7	38.00	-0.33	.739	6	37.50	-0.32	.752	20.00	.885
	3	6	35.00	-0.68	.498	7	39.00	-0.68	.498	15.00	.383
	4	5	36.00	0.00	1.00	5	37.00	-1.84	.066*	12.50	1.00
	5	2	36.50	-0.45	.655	3	40.00	-0.27	.785	3.00	1.00

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

* $p < .10$, ** $p < .05$.

Table B.5.

Median rank differences within and between treatment groups for work locus of control (WLoC), negative affect (NAS), positive affect (PAS), and trait anxiety (STAI-T)

	AT					ACT				AT-ACT	
	T	n	Mdn	z	p	n	Mdn	z	p	U	p
WLoC	1	8	67.50			8	63.50			27.50	.635
	2	8	69.50	-0.21	.833	8	65.50	-1.54	.123	31.50	.958
	3	8	67.00	-0.34	.733	7	69.00	-1.87	.062*	20.50	.384
	4	6	70.00	0.00	1.000	6	64.00	-1.89	.058*	15.50	.687
	5	5	70.00	-0.82	.414	3	66.00	-.535	.593	7.00	.881
NAS	1	8	21.50			8	20.50			27.00	.598
	2	8	20.50	-0.28	.779	8	17.50	-2.52	.012**	30.50	.875
	3	6	15.50	-2.21	.027*	7	20.00	-2.05	.041**	11.50	.171
	4	5	13.00	-2.03	.042*	5	20.00	-1.75	.080*	4.50	.094*
	5	2	17.50	0.00	1.000	3	17.00	-1.60	.109	3.00	1.000
PAS	1	8	26.00			8	27.50			28.00	.673
	2	8	27.00	-0.93	.352	8	31.50	-1.10	.271	19.50	.829
	3	6	28.00	0.00	1.000	7	30.00	-0.32	.752	19.50	.829
	4	5	28.00	-0.37	.715	5	32.00	-0.41	.680	12.00	.917
	5	2	35.50	-1.34	.180	3	36.00	-1.07	.285	2.00	.564

Table B.5. Continued

STAI-T	1	8	45.00			8	50.50			31.00	.916
	2	8	43.50	-0.68	.499	8	39.50	-1.19	.233	26.50	.563
	3	5	45.00	-1.21	.225	8	43.50	-1.12	.262	16.00	.557
	4	2	45.00	-0.45	.655	8	37.00	-1.89	.058*	3.00	.190
	5	1	46.00			4	35.50	-1.07	.285	1.00	.480

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

* $p < .10$, ** $p < .05$.

Table B.6.

Median differences within and between treatment groups for frequency of automatic negative thoughts (ATQ-NF), belief in automatic negative thoughts (ATQ-NB), frequency of automatic positive thoughts (ATQ-PF), and belief in automatic positive thoughts (ATQ-PB)

	AT					ACT					AT-ACT	
	T	<i>n</i>	<i>Mdn</i>	<i>z</i>	<i>p</i>	<i>n</i>	<i>Mdn</i>	<i>z</i>	<i>p</i>	<i>U</i>	<i>p</i>	
ATQ-	1	7	43.00			7	58.00			13.00	.141	
NF	2	7	46.00	-1.19	.235	6	44.50	-0.94	.345	16.50	.519	
	3	6	38.50	-0.95	.344	6	41.50	-1.48	.138	14.00	.522	
	4	5	39.00	-1.21	.225	5	49.00	-1.84	.066*	6.00	.175	
	5	3	40.00	-0.45	.655	3	53.00	-1.34	.180	3.00	.513	
ATQ-	1	7	54.00			7	52.00			19.00	.482	
NB	2	7	44.00	-1.19	.236	6	52.50	-0.95	.344	14.50	.352	
	3	6	37.50	-1.36	.173	6	43.00	-1.76	.078*	14.00	.522	
	4	5	32.00	-2.02	.043**	5	44.00	-2.04	.041**	4.00	.076*	
	5	3	36.00	-0.45	.655	3	42.00	-1.07	.285	4.00	.827	
ATQ-	1	7	58.00			7	74.00			20.00	.565	
PF	2	7	69.00	-0.53	.596	6	60.50	-0.31	.753	14.00	.317	
	3	6	71.50	-0.11	.917	7	60.00	-1.79	.074*	20.50	.943	
	4	5	76.00	-0.14	.893	5	61.00	-1.48	.138	8.00	.341	
	5	2	68.50	-0.45	.655	3	58.00	-0.54	.593	2.00	.564	

Table B.6. Continued

ATQ-	1	7	81.00			7	74.00			20.50	.607
PB	2	7	96.00	-0.85	.397	6	80.50	-0.73	.463	12.50	.224
	3	6	84.00	-0.11	.916	7	91.00	-0.67	.500	20.00	.886
	4	5	105.00	-0.14	.893	5	81.00	-0.14	.893	5.50	.142
	5	2	77.50	0.00	1.00	3	72.00	-1.07	.285	2.00	.564

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

* $p < .10$, ** $p < .05$.

Table B.7.

Median rank differences within and between treatment groups for psychological flexibility (AAQ) and the Willingness (AAQ-W) and Action subscales (AAQ-A)

	AT					ACT				AT-ACT	
	T	n	Mdn	z	p	n	Mdn	z	p	U	p
AAQ	1	8	70.00			8	70.00			32.00	1.000
	2	8	74.00	-0.42	.674	8	75.50	-0.85	.395	30.00	.833
	3	8	68.50	-0.93	.351	5	67.00	-1.08	.279	17.00	.660
	4	5	78.00	-0.18	.854	6	73.50	-0.95	.343	11.00	.464
	5	5	73.00	-1.10	.273	3	74.00	0.00	1.000	6.50	.764
AAQ-W	1	8	31.00			8	32.00			31.50	.958
	2	8	29.50	-0.21	.833	8	31.00	-0.09	.933	26.55	.561
	3	8	29.00	-0.53	.599	5	28.00	-1.00	.317	16.50	.603
	4	5	31.00	-1.83	.068*	6	33.50	-0.14	.892	10.00	.359
	5	5	30.00	-0.92	.357	3	32.00	0.00	1.000	4.50	.368
AAQ-A	1	8	39.50			8	39.50			27.50	.635
	2	8	42.00	-1.38	.167	8	44.50	-1.26	.208	31.00	.916
	3	8	40.00	-1.28	.202	5	40.00	-1.08	.279	19.50	.941
	4	5	46.00	-1.10	.273	6	40.50	-1.17	.244	5.50	.081*
	5	5	43.00	-1.68	.102	3	42.00	0.00	1.000	6.00	.651

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

* $p < .10$, ** $p < .05$.

Table B.8.

Median differences within and between treatment groups overall mindfulness (FFMQ) and its subscales of Nonreactivity (FFMQ-NR), Observing (FFMQ-O), Acting with Awareness (FFMQ-A), Describing (FFMQ-D), and Nonjudging (FFMQ-NJ)

	AT					ACT				AT-ACT	
	T	n	Mdn	z	p	n	Mdn	z	p	U	p
FFMQ	1	8	126.50			8	122.50			30.50	.875
	2	8	130.50	0.00	1.000	8	133.00	-1.89	.058*	27.50	.636
	3	8	129.50	-0.07	.944	6	135.00	-1.68	.093*	16.50	.332
	4	5	123.00	-1.46	.144	6	135.00	-1.63	.104	13.00	.715
	5	5	117.00	0.00	1.000	3	129.00	-0.54	.593	6.00	.655
FFMQ-NR	1	8	18.00			8	18.00			24.50	.425
	2	8	17.00	-0.85	.398	8	18.50	-0.94	.350	23.50	.367
	3	8	18.00	-0.77	.441	6	20.50	-1.63	.104	14.00	.187
	4	5	14.00	-2.06	.039**	6	20.50	-1.38	.168	8.50	.233
	5	5	20.00	-0.37	.715	3	20.00	-1.09	.276	7.50	1.00
FFMQ-O	1	8	20.50			8	24.00			24.00	.399
	2	8	26.50	-0.35	.725	8	27.50	-1.27	.203	25.00	.460
	3	8	26.50	-0.93	.352	6	28.50	-0.11	.916	21.00	.697
	4	5	27.00	-0.68	.498	6	26.00	-1.38	.167	13.00	.714
	5	5	30.00	-0.94	.345	3	25.00	-1.34	.180	6.00	.653

Table B.8. Continued

FFMQ-	1	8	25.50			8	23.00		22.00	.291	
A	2	8	27.00	0.00	1.000	8	27.50	-1.26	.176	28.00	.673
	3	8	27.00	-0.17	.865	6	27.50	-1.78	.075*	19.50	.556
	4	5	29.00	-0.55	.581	6	28.00	-1.47	.141	12.50	.640
	5	5	25.00	-0.67	.500	3	29.00	-1.07	.285	5.00	.456
FFMQ-	1	8	25.50			8	26.50		29.50	.792	
D	2	8	27.00	-0.07	.944	8	28.00	-0.85	.396	32.00	1.00
	3	8	29.00	-0.77	.440	6	27.50	-1.81	.071*	23.00	.897
	4	5	25.00	-0.68	.498	6	29.00	-1.22	.223	10.50	.410
	5	5	26.00	-0.81	.416	3	27.00	-1.34	.180	7.00	.881
FFMQ-	1	8	30.50			8	30.50		30.00	.833	
NJ	2	8	33.00	-0.17	.866	8	33.50	-1.02	.310	24.50	.422
	3	8	29.50	-0.84	.398	6	33.00	-1.21	.225	14.50	.219
	4	5	33.00	-1.29	.197	6	31.00	0.00	1.00	13.00	.714
	5	5	26.00	-0.14	.893	3	29.00	-0.45	.655	4.00	.297

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

* $p < .10$, ** $p < .05$.

Table B.9.

Median rank differences within and between treatment groups for value placed on approach coping (ApprchC-V), use of approach coping (ApprchC-A), value placed on avoidance coping (AvoidC-V), and use of avoidance coping (AvoidC-A)

	AT					ACT				AT-ACT	
	T	n	Mdn	z	p	n	Mdn	z	p	U	p
Apprch	1	8	31.50			8	32.50			26.50	.560
C-V	2	8	30.50	-0.86	.389	7	32.00	-0.11	.916	15.00	.128
	3	8	32.00	-0.53	.598	6	33.00	-0.21	.833	17.00	.359
	4	5	34.00	-0.18	.854	6	34.50	-1.89	.059*	11.50	.517
	5	5	30.00	-0.37	.713	3	34.00	-0.45	.655	1.50	.065
Apprch	1	8	21.00			8	23.50			28.00	.673
C-A	2	8	25.00	-0.85	.395	8	22.00	-0.77	.440	26.50	.562
	3	8	21.50	-0.57	.572	5	26.00	-1.60	.109	16.50	.607
	4	5	24.00	0.00	1.000	6	25.50	-0.95	.344	12.00	.582
	5	5	23.00	-0.68	.498	3	27.00	-1.60	.109	5.00	.456
AvoidC-	1	8	14.00			8	12.50			24.00	.393
V	2	8	14.50	-0.18	.861	7	13.00	0.00	1.000	23.50	.600
	3	8	12.00	-1.71	.087*	6	13.00	-1.29	.197	23.00	.896
	4	5	12.00	-1.76	.078*	6	12.00	-0.82	.414	11.00	.460
	5	5	13.00	-0.37	.715	3	15.00	0.00	1.000	5.00	.451

Table B.9. Continued

AvoidC-	1	8	12.50			8	11.00			32.00	1.000
A	2	8	10.50	-1.39	.163	8	10.00	-1.27	.206	29.00	.750
	3	8	12.00	-0.37	.715	5	8.00	-1.84	.066*	13.50	.327
	4	5	9.00	-1.07	.285	6	8.50	-1.05	.292	14.00	.846
	5	5	9.00	-1.34	.180	3	12.00	0.00	1.000	7.50	1.000

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

* $p < .10$, ** $p < .05$.

Table B.10.

Median rank differences within and between treatment groups for values-to-action incongruence for all coping strategies (VCAQ-VA), for approach coping (ApprochC-VA), and for avoidance coping (AvoidC-VA)

	AT					ACT				AT-ACT	
	T	<i>n</i>	<i>Mdn</i>	<i>z</i>	<i>p</i>	<i>n</i>	<i>Mdn</i>	<i>z</i>	<i>p</i>	<i>U</i>	<i>p</i>
VCAQ-	1	8	54.50			8	53.50			29.50	.793
VA	2	8	44.00	-0.98	.326	7	50.00	-0.09	.932	21.00	.417
	3	8	51.00	-0.56	.575	5	47.00	-1.48	.138	15.50	.509
	4	5	48.00	-1.29	.197	6	47.00	-0.52	.600	11.00	.463
	5	5	39.00	-1.21	.225	3	39.00	-1.60	.109	6.50	.764
Approch	1	8	8.50			8	9.50			28.00	.673
C-VA	2	8	6.00	-1.53	.127	7	10.00	-0.09	.932	13.50	.091*
	3	8	8.50	-0.07	.944	5	7.00	-1.22	.223	15.50	.507
	4	5	8.00	-0.68	.496	6	8.50	-0.84	.399	14.00	.851
	5	5	4.00	-0.67	.500	3	9.00	-1.07	.285	7.50	1.000
AvoidC-	1	8	3.50			8	2.50			28.00	.670
VA	2	8	2.50	-0.42	.672	7	3.00	-0.41	.679	25.50	.768
	3	8	2.00	-0.71	.481	5	1.00	-0.58	.564	16.50	.597
	4	5	1.00	-1.29	.197	6	3.00	-0.78	.480	7.50	.159
	5	5	4.00	-0.37	.715	3	3.00	0.00	1.00	4.50	.368

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = 1st follow-up, 4 = 2nd follow-up, 5 = 3rd follow-up. *Mdn* = Median, *z* = Wilcoxon sign test statistic, *U* = Mann-Whitney statistic.

p* < .10, *p* < .05.

APPENDIX C

Tables of Tau Correlations Between T3 Process Variables and T4 Outcomes

Table C.1.

Tau Correlations Between T3 Process Variables and T4 Stress Outcomes for Each

Group

	JSS-F		JSS-I	SRLE-F		SRLE-I	
	AT	ACT	AT	AT	ACT	AT	ACT
NAS	0.20	-0.07	0.60	0.40	0.80**	0.60	0.80**
ATQ-NF	0.20	0.07	0.60	0.80**	0.60	0.60	0.60
ATQ-NB	-0.20	0.08	0.20	0.40	0.60	0.20	0.60
VCAQ-VA	0.41	0.33	0.28	0.95**	0.00	0.74*	0.00
AvoidC-V	0.00		0.14	-0.11		-0.32	
[AAQ-A]	0.74*						
[AvoidC-V & -A]			0.89**				
WLoC		-0.74*			0.11		0.11
STAI-T		0.14			-0.20		-0.20
FFMQ		-0.60			-0.20		-0.20
FFMQ-NR		-0.40			-0.80**		-0.80**
FFMQ-A		-1.00***			-0.20		-0.20
AvoidC-A		0.91*			0.55		0.55
ApprchC.A		-0.33			0.00		0.00

Table C.1. Continued

ApprchC-VA	0.67	0.33	0.33
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Note. Process variables in brackets are meaningfully improved T4 (second follow-up) process variables that significantly predict the specified T4 outcome, included because no process variable at T3 correlated with the outcome in question.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Table C.2.

Tau Correlations Between T3 Process Variables and T4 Mental Health

Outcomes for Each Group

	BDI		STAI-S		GHQ	
	AT	ACT	AT	ACT	AT	ACT
NAS	.74*	.20	.60	.33	.32	.60*
ATQ-NF	.74*	.00	.20	.47	.11	.20
ATQ-NB	.32	.00	-.20	.47	-.32	.20
VCAQ-VA	.67	-.33	.14	.00	-.07	.00
AvoidC-V	-.22		-.41		-.71*	
[ATQ-NF]			.80**			
WLoC		-.53		-.11		-.32
STAI-T		.00		.00		-.14
FFMQ		-.80*		-.40		-.60
FFMQ-NR		-.60		-1.00***		-.80**
FFMQ-A		-.40		-.40		-.60
AvoidC-A		.55		.55		.55
ApprchC.A		.33		.00		.00
ApprchC-VA		.00		.33		.33

Note. Process variables in brackets are meaningfully improved T4 (second follow-up) process variables that significantly predict the specified T4 outcome, included because no process variable at T3 correlated with the outcome in question.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Table C.3.

Tau Correlations Between T3 Process Variables and T4

Physical Illness & Functional Interference Outcomes in ACT

	SF-1	SF-6
NAS	.29	.28
ATQ-NF	.45	.18
ATQ-NB	.45	.18
VCAQ-VA	.36	.32
WLoC	-.18	-.36
STAI-T	.17	.42
FFMQ	-.26	-.55
FFMQ-NR	-.60	-.37
FFMQ-A	-.45	-.76*
AvoidC-A	1.00***	.76
ApprchC.A	-.36	-.32
ApprchC-VA	.36	.63

* $p < .10$, ** $p < .05$, *** $p < .01$.

Table C.4.

Tau Correlations Between T3 Process Variables and T4 Quality of Life
and Job Satisfaction Outcomes for Each Group

	QoL-Work		QoL	JSAT	
	AT	ACT	ACT	AT	ACT
NAS	-.11	.07	-.55	.00	-.20
ATQ-NF	.11	-.07	-.41	-.40	-.33
ATQ-NB	.53	-.07	-.41	-.40	-.33
VCAQ-VA	.07	-.18	.00	-.83**	.00
AvoidC-V	-.14			-.28	
[ATQ-NB]	.74*				
WLoC		-.12	.22		.53
STAI-T		.59	.07		-.41
FFMQ		.22	.53		.40
FFMQ-NR		.45	.95**		.60
FFMQ-A		.22	.53		.40
AvoidC-A		.00	-.55		-.91*
ApprchC.A		.18	.00		.00
ApprchC-VA		.18	-.33		-.33
[ATQ-PF]		.94**			

Table C.4. Continued

[ApprchC-V]	.89**
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Note. Process variables in brackets are meaningfully improved T4 (second follow-up) process variables that significantly predict the specified T4 outcome, included because no process variable at T3 correlated with the outcome in question.

* $p < .10$, ** $p < .05$, *** $p < .01$.

APPENDIX D

Tables of Means, Mean Differences, and Hedge's *g* Effect Sizes

Within and Between Groups

Table D.1.

Means, mean differences, and Hedge's *g* effect sizes within and between treatment groups for job stress (JSS) and life stress (SRLE)

	AT					ACT				AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>
JSS-F	1	8	47.13			8	41.38			5.75	0.30
	2	8	40.00	-7.13	0.36	8	34.25	-7.13	0.40	5.75	0.31
	3	8	31.75	-15.38	0.77*	7	30.86	-10.52	0.49	0.89	0.04
	4	6	30.67	-16.46	0.80**	6	32.67	-8.71	0.52*	-2.00	-0.11
	5	5	36.20	-10.93	0.59*	3	33.67	-7.71	0.37	2.53	0.12
JSS-I	1	8	42.50			8	36.63			5.88	0.31
	2	8	31.88	-10.63	0.54*	8	29.88	-6.75	0.40	2.00	0.11
	3	8	28.63	-13.88	0.64*	7	27.71	-8.91	0.43	0.91	0.04
	4	6	22.17	-20.33	0.43	6	30.67	-5.96	-0.04	-8.50	-0.41
	5	5	27.20	-15.30	0.21	3	27.33	-9.29	0.16	-0.13	-0.01
SRLE-F	1	7	55.14			7	67.29			-12.14	-0.53*
	2	7	48.14	-7.00	0.27	6	57.33	-9.95	0.37	-9.19	-0.31
	3	6	40.67	-14.48	0.65*	6	45.17	-22.12	0.82**	-4.50	-0.17
	4	5	29.60	-25.54	1.10**	5	49.00	-18.29	0.71*	-19.40	-0.72*
	5	3	31.67	-23.48	1.05**	3	52.67	-14.62	0.53*	-21.00	-0.64*

Table D.1. Continued

SRLE-I	1	7	54.14			7	72.14			-18.00	-0.58*
	2	7	43.43	-10.71	0.35	6	53.33	-18.81	0.66*	-9.90	-0.35
	3	6	36.00	-18.14	0.66*	6	42.33	-29.81	1.00**	-6.33	-0.25
	4	5	27.00	-27.14	1.00**	5	44.20	-27.94	0.98**	-17.20	-0.78*
	5	3	24.33	-29.81	1.02**	3	44.33	-27.81	0.83**	-20.00	-0.60*

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.2.

Means, mean differences, and Hedge's *g* effect sizes within and between treatment groups for depression (JBDI), state anxiety (STAI-S), general distress (GHQ), and general physical health (SF-1)

	AT					ACT					AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>	
BDI	1	8	16.63			7	14.71			1.91	0.27	
	2	8	12.63	-4.00	0.50*	7	9.71	-5.00	0.72*	2.91	0.36	
	3	6	5.83	-10.79	1.49**	6	9.67	-5.05	0.83**	-3.83	-0.60*	
	4	5	5.00	-11.63	1.81**	5	7.00	-7.71	1.07**	-2.00	-0.31	
	5	3	6.67	-9.96	1.25**	3	8.67	-6.05	0.87**	-2.00	-0.21	
STAI-S	1	8	47.75			8	48.63			-0.88	-0.08	
	2	8	43.13	-4.63	0.36	8	41.63	-7.00	0.65*	1.50	0.11	
	3	8	39.38	-8.38	0.76*	7	46.86	-1.77	0.14	-7.48	-0.57*	
	4	6	37.50	-10.25	1.00**	6	39.83	-8.79	0.88**	-2.33	-0.24	
	5	5	44.00	-3.75	0.29	3	40.00	-8.63	0.70*	4.00	0.23	
GHQ	1	8	20.00			8	19.88			0.13	0.02	
	2	8	17.75	-2.25	0.32	8	14.25	-5.63	1.12**	3.50	0.51*	
	3	8	13.88	-6.13	0.97**	7	14.71	-5.16	1.06**	-0.84	-0.14	
	4	6	14.17	-5.83	1.10**	6	14.33	-5.54	1.01**	-0.17	-0.03	
	5	5	17.60	-2.40	0.40	3	15.00	-4.88	1.15**	2.60	0.49	

Table D.2. Continued

SF-1	1	7	2.43			7	3.00			-0.57	-0.59*
	2	5	2.80	0.37	-0.42	8	2.38	-0.63	0.62*	0.43	0.45
	3	4	2.75	0.32	-0.34	8	2.50	-0.50	0.54*	0.25	0.28
	4	2	3.00	0.57	-0.56*	8	2.13	-0.88	0.68*	0.88	0.58*
	5	1	3.00			5	2.20	-0.80	0.71*	0.80	0.58*

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.3.

Means, mean differences, and Hedge's g effect sizes within and between treatment groups for interference in social activities by physical health or emotional problems (SF-6), overall quality of life (QoL), and work quality of Life (QoL-W)

	AT					ACT				AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>
SF-6	1	7	2.00			7	2.43			-0.43	-0.50*
	2	5	2.80	0.80	-0.71*	8	1.50	-0.93	1.32**	1.30	1.35**
	3	4	2.00	0.00	0.00	8	1.25	-1.18	1.75**	0.75	1.17**
	4	2	3.50	1.50	-1.66**	8	1.50	-0.93	1.13**	2.00	2.41**
	5	1	3.00	1.00	-1.06**	5	1.60	-0.83	1.09**	1.40	2.04**
QoL	1	8	21.88			8	15.88			6.00	0.17
	2	8	22.75	0.88	-0.03	8	12.00	-3.88	0.11	10.75	0.33
	3	8	25.50	3.63	-0.11	7	16.00	0.13	0.00	9.50	0.32
	4	6	37.00	15.13	-0.48	6	23.50	7.63	-0.24	13.50	0.50*
	5	5	16.00	-5.88	0.18	3	19.67	3.79	-0.10	-3.67	-0.10
QoL-W	1	8	-0.38			8	-1.38			1.00	0.33
	2	8	0.38	0.75	-0.20	8	-1.38	0.00	0.00	1.75	0.59*
	3	8	0.00	0.38	-0.10	7	-1.14	0.23	-0.09	1.14	0.36
	4	6	1.67	2.04	-0.62*	6	0.00	1.38	-0.62*	1.67	0.68*
	5	5	-0.60	-0.23	0.06	3	-1.00	0.38	-0.15	0.40	0.10

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = 1st follow-up, 4 = 2nd follow-up, 5 = 3rd follow-up. T-T1 = Difference between pre-treatment mean and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.4.

Means, mean differences, and Hedge's g effect sizes within and between treatment groups for job satisfaction (JSAT), motivation (IJM), meaning (WIS), and importance (HONS)

	AT					ACT				AT-ACT	
	T	N	<i>M</i>	T-T1	<i>g</i>	N	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>
JSAT	1	8	68.88			8	64.38			4.50	0.28
	2	8	71.00	2.13	-0.10	8	64.25	-0.13	0.01	6.75	0.41
	3	8	71.63	2.75	-0.13	7	67.14	2.77	-0.24	4.48	0.24
	4	6	81.00	12.13	-0.65*	6	77.50	13.13	-1.21**	3.50	0.26
	5	5	72.20	3.33	-0.17	3	69.33	4.96	-0.37	2.87	0.15
IJM	1	8	35.25			8	33.38			1.88	0.30
	2	8	35.50	0.25	-0.08	8	35.63	2.25	-0.35	-0.13	-0.03
	3	8	33.50	-1.75	0.53*	6	36.50	3.13	-0.47	-3.00	-0.88**
	4	5	35.20	-0.05	0.02	6	33.17	-0.21	0.02	2.03	0.26
	5	5	36.60	1.35	-0.46	3	32.00	-1.38	0.18	4.60	1.25**
WIS	1	8	28.13			8	29.13			-1.00	-0.14
	2	8	28.75	0.63	-0.10	8	29.38	0.25	-0.03	-0.63	-0.09
	3	6	30.67	2.54	-0.43	7	29.00	-0.13	0.02	1.67	0.33
	4	5	30.00	1.88	-0.31	5	28.40	-0.73	0.08	1.60	0.17
	5	2	30.00	1.88	-0.26	3	24.00	-5.13	0.61*	6.00	0.47

Table D.4. Continued

HONS	1	7	37.29			7	37.00			0.29	0.08
	2	7	37.57	0.29	-0.08	6	37.33	0.33	-0.10	0.24	0.08
	3	6	36.00	-1.29	0.32	7	37.71	0.71	-0.21	-1.71	-0.46
	4	5	37.00	-0.29	0.08	5	36.80	-0.20	0.06	0.20	0.05
	5	2	36.50	-0.79	0.18	3	37.00	0.00	0.00	-0.50	-0.07

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.5.

Means, mean differences, and Hedge's g effect sizes within and between treatment groups for work locus of control (WLoC), negative affect (NAS), positive affect (PAS), and trait anxiety (STAI-T)

	AT					ACT				AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>
WLoC	1	8	64.75			8	63.38			1.38	0.13
	2	8	65.38	0.63	-0.06	8	67.13	3.75	-0.39	-1.75	-0.18
	3	8	65.50	0.75	-0.07	7	68.43	5.05	-0.51*	-2.93	-0.29
	4	6	68.00	3.25	-0.30	6	65.67	2.29	-0.24	2.33	0.26
	5	5	68.40	3.65	-0.29	3	68.67	5.29	-0.49	-0.27	-0.02
NAS	1	8	21.75			8	25.25			-3.50	-0.41
	2	8	20.38	-1.38	0.19	8	20.13	-5.13	0.60*	0.25	0.03
	3	6	15.67	-6.08	1.16**	7	20.00	-5.25	0.60*	-4.33	-0.80**
	4	5	15.80	-5.95	0.95**	5	22.20	-3.05	0.32	-6.40	-0.90**
	5	2	17.50	-4.25	0.68*	3	18.67	-6.58	0.67*	-1.17	-0.17
PAS	1	8	29.13			8	28.00			1.13	0.12
	2	8	26.88	-2.25	0.20	8	31.63	3.63	-0.47	-4.75	-0.46
	3	6	30.33	1.21	-0.10	7	27.57	-0.43	0.06	2.76	0.27
	4	5	29.40	0.27	-0.03	5	30.40	2.40	-0.35	-1.00	-0.16
	5	2	35.50	6.38	-0.54*	3	33.33	5.33	-0.73*	2.17	0.16

Table D.5. Continued

STAI-T	1	8	46.75			8	48.13			-1.38	-0.16
	2	8	45.00	-1.75	0.18	8	42.38	-5.75	0.66*	2.63	0.27
	3	5	44.60	-2.15	0.25	8	43.00	-5.13	0.65*	1.60	0.21
	4	2	45.00	-1.75	0.17	8	38.63	-9.50	1.26**	6.38	0.77*
	5	1	46.00	-0.75	0.07	4	38.50	-9.63	1.10**	7.50	0.51*

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.6.

Means, mean differences, and Hedge's g effect sizes within and between treatment groups for frequency of automatic negative thoughts (ATQ-NF), belief in automatic negative thoughts (ATQ-NB), frequency of automatic positive thoughts (ATQ-PF), and belief in automatic positive thoughts (ATQ-PB)

	AT					ACT					AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>	
ATQ-	1	7	53.00			7	62.14			-9.14	-0.40	
NF	2	7	51.43	-1.57	0.06	6	55.17	-6.98	0.29	-3.74	-0.14	
	3	6	42.67	-10.33	0.50*	6	47.50	-14.64	0.65*	-4.83	-0.24	
	4	5	37.80	-15.20	0.79*	5	50.20	-11.94	0.57*	-12.40	-0.83**	
	5	3	41.00	-12.00	0.54*	3	54.67	-7.48	0.31	-13.67	-0.57	
ATQ-	1	7	52.14			7	58.14			-6.00	-0.37	
NB	2	7	48.86	-3.29	0.17	6	66.33	8.19	-0.25	-17.48	-0.52	
	3	6	42.17	-9.98	0.60*	6	44.67	-13.48	0.90**	-2.50	-0.16	
	4	5	33.60	-18.54	1.28**	5	45.20	-12.94	0.93**	-11.60	-1.16**	
	5	3	40.00	-12.14	0.72*	3	47.33	-10.81	0.62*	-7.33	-0.36	
ATQ-	1	7	71.86			7	79.71			-7.86	-0.26	
PF	2	7	78.57	6.71	-0.23	6	69.33	-10.38	0.41	9.24	0.38	
	3	6	73.50	1.64	-0.05	7	66.86	-12.86	0.48	6.64	0.24	
	4	5	75.00	3.14	-0.10	5	61.00	-18.71	0.82**	14.00	0.63*	
	5	2	68.50	-3.36	0.10	3	71.00	-8.71	0.29	-2.50	-0.06	

Table D.6. Continued

ATQ-	1	7	90.71			7	82.14			8.57	0.26
PB	2	7	97.71	7.00	-0.23	6	86.67	4.52	-0.14	11.05	0.36
	3	6	82.17	-8.55	0.25	7	88.43	6.29	-0.19	-6.26	-0.18
	4	5	94.40	3.69	-0.11	5	79.60	-2.54	0.09	14.80	0.55*
	5	2	77.50	-13.21	0.35	3	88.67	6.52	-0.18	-11.17	-0.20

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.7.

Means, mean differences, and Hedge's g effect sizes within and between treatment groups for psychological flexibility (AAQ), the Willingness subscale (AAQ-W), and the Action subscale (AAQ-A)

	AT					ACT				AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>
AAQ	1	8	72.50			8	71.38			1.13	0.11
	2	8	74.13	1.63	-0.15	8	74.75	3.38	-0.40	-0.63	-0.07
	3	8	71.13	-1.38	0.13	5	70.80	-0.58	0.06	0.33	0.03
	4	5	76.40	3.90	-0.40	6	74.50	3.13	-0.39	1.90	0.34
	5	5	72.40	-0.10	0.01	3	74.33	2.96	-0.34	-1.93	-0.24
AAQ-W	1	8	31.50			8	31.50			0.00	0.00
	2	8	31.63	0.13	-0.02	8	32.00	0.50	-0.11	-0.38	-0.08
	3	8	31.00	-0.50	0.08	5	30.20	-1.30	0.26	0.80	0.16
	4	5	30.80	-0.70	0.11	6	32.83	1.33	-0.30	-2.03	-0.52*
	5	5	30.20	-1.30	0.20	3	32.33	0.83	-0.16	-2.13	-0.44
AAQ-A	1	8	41.00			8	39.88			1.13	0.23
	2	8	42.50	1.50	-0.29	8	42.75	2.88	-0.61*	-0.25	-0.05
	3	8	40.13	-0.88	0.17	5	40.60	0.73	-0.16	-0.48	-0.10
	4	5	45.60	4.60	-1.01**	6	41.67	1.79	-0.38	3.93	0.97**
	5	5	42.20	1.20	-0.24	3	42.00	2.13	-0.49	0.20	0.05

Table D.7. Continued

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.8.

Means, mean differences, and Hedge's *g* effect sizes within and between treatment groups for overall mindfulness (FFMQ) and its subscales of Nonreactivity (FFMQ-NR), Observing (FFMQ-O), Acting with Awareness (FFMQ-A), Describing (FFMQ-D), and Nonjudging (FFMQ-NJ)

	AT					ACT					AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>	
FFMQ	1	8	126.75			8	124.00			2.75	0.16	
	2	8	126.38	-0.38	0.02	8	134.13	10.13	-0.56*	-7.75	-0.38	
	3	8	127.00	0.25	-0.01	6	137.17	13.17	-0.65*	-10.17	-0.49	
	4	5	126.60	-0.15	0.01	6	132.50	8.50	-0.55*	-5.90	-0.30	
	5	5	126.20	-0.55	0.02	3	133.33	9.33	-0.58*	-7.13	-0.28	
FFMQ-NR	1	8	19.00			8	17.13			1.88	0.52*	
	2	8	17.00	-2.00	0.45	8	18.63	1.50	-0.44	-1.63	-0.38	
	3	8	17.63	-1.38	0.36	6	20.50	3.38	-0.86**	-2.88	-0.70*	
	4	5	15.20	-3.80	0.76*	6	18.83	1.71	-0.42	-3.63	-0.64*	
	5	5	19.40	0.40	-0.09	3	19.67	2.54	-0.90**	-0.27	-0.06	
FFMQ-O	1	8	23.75			8	25.88			-2.13	-0.28	
	2	8	24.75	1.00	-0.11	8	27.50	1.63	-0.30	-2.75	-0.38	
	3	8	25.50	1.75	-0.22	6	27.33	1.46	-0.23	-1.83	-0.28	
	4	5	27.40	3.65	-0.38	6	26.00	0.13	-0.03	1.40	0.19	
	5	5	24.80	1.05	-0.11	3	25.33	-0.54	0.11	-0.53	-0.07	

Table D.8. Continued

FFMQ-	1	8	27.38			8	24.00			3.38	0.53*
A	2	8	26.63	-0.75	0.13	8	28.38	4.38	-0.67*	-1.75	-0.30
	3	8	27.00	-0.38	0.07	6	28.83	4.83	-0.71*	-1.83	-0.31
	4	5	29.20	1.83	-0.28	6	28.50	4.50	-0.67*	0.70	0.10
	5	5	26.60	-0.77	0.10	3	30.67	6.67	-0.99**	-4.07	-0.46
FFMQ-	1	8	27.00			8	26.38			0.63	0.10
D	2	8	27.50	0.50	-0.07	8	27.25	0.88	-0.16	0.25	0.04
	3	8	28.38	1.38	-0.21	6	28.17	1.79	-0.30	0.21	0.03
	4	5	25.80	-1.20	0.17	6	28.33	1.96	-0.34	-2.53	-0.41
	5	5	29.00	2.00	-0.26	3	26.67	0.29	-0.06	2.33	0.32
FFMQ-	1	8	29.63			8	30.63			-1.00	-0.15
NJ	2	8	30.50	0.88	-0.14	8	32.38	1.75	-0.38	-1.88	-0.41
	3	8	28.50	-1.13	0.16	6	32.33	1.71	-0.36	-3.83	-0.66*
	4	5	29.00	-0.63	0.07	6	30.83	0.21	-0.05	-1.83	-0.25
	5	5	26.40	-3.23	0.43	3	31.00	0.38	-0.08	-4.60	-0.70*

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.9.

Means, mean differences, and Hedge's g effect sizes within and between treatment groups for value placed on approach coping (ApprchC-V), use of approach coping (ApprchC-A), value placed on avoidance coping (AvoidC-V), and use of avoidance coping (AvoidC-A)

	AT					ACT					AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>	
Apprch	1	8	31.75			8	32.25			-0.50	-0.17	
C-V	2	8	30.50	-1.25	0.30	7	32.43	0.18	-0.08	-1.93	-0.50*	
	3	8	31.25	-0.50	0.16	6	32.50	0.25	-0.10	-1.25	-0.43	
	4	5	32.20	0.45	-0.11	6	34.00	1.75	-0.68*	-1.80	-0.47	
	5	5	30.20	-1.55	0.48	3	34.00	1.75	-0.68*	-3.80	-1.24**	
Apprch	1	8	22.38			8	22.63			-0.25	-0.03	
C-A	2	8	25.88	3.50	-0.41	8	22.63	0.00	0.00	3.25	0.45	
	3	8	24.63	2.25	-0.30	5	26.00	3.38	-0.51*	-1.38	-0.20	
	4	5	25.60	3.23	-0.39	6	25.83	3.21	-0.53*	-0.23	-0.04	
	5	5	24.40	2.03	-0.27	3	27.67	5.04	-0.70*	-3.27	-0.46	
Avoid.C	1	8	14.63			8	13.38			1.25	0.32	
-V	2	8	14.75	0.13	-0.04	7	14.00	0.63	-0.14	0.75	0.18	
	3	8	12.38	-2.25	0.84**	6	13.33	-0.04	0.01	-0.96	-0.26	
	4	5	11.20	-3.43	1.33**	6	13.67	0.29	-0.06	-2.47	-0.59*	
	5	5	13.00	-1.63	0.46	3	14.00	0.63	-0.14	-1.00	-0.24	

Table D.9. Continued

Avoid.C	1	8	12.00			8	12.13			-0.13	-0.04
-A	2	8	11.38	-0.63	0.18	8	11.13	-1.00	0.28	0.25	0.07
	3	8	12.50	0.50	-0.11	5	10.20	-1.93	0.58*	2.30	0.50*
	4	5	9.80	-2.20	0.61*	6	9.83	-2.29	0.79*	-0.03	-0.01
	5	5	12.40	0.40	-0.08	3	11.67	-0.46	0.14	0.73	0.12

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = First follow-up, 4 = Second follow-up, 5 = third follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time.

Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

Table D.10.

Means, mean differences, and Hedge's g effect sizes within and between treatment groups for values-to-action incongruence for all coping strategies (VCAQ-VA), for approach coping (ApprchC-VA), and for avoidance coping (AvoidC-VA)

	AT					ACT				AT-ACT	
	T	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	<i>n</i>	<i>M</i>	T-T1	<i>g</i>	Diff	<i>g</i>
VCAQ-	1	8	56.38			8	58.75			-2.38	-0.13
VA	2	8	47.00	-9.38	0.46	7	54.86	-3.89	0.19	-7.86	-0.35
	3	8	49.50	-6.88	0.51*	5	44.40	-14.35	0.62*	5.10	0.28
	4	5	59.00	2.63	-0.18	6	56.50	-2.25	0.09	2.50	0.11
	5	5	44.40	-11.98	0.86**	3	40.33	-18.42	0.82**	4.07	0.25
Apprch	1	8	9.38			8	9.88			-0.50	-0.08
C-VA	2	8	6.13	-3.25	0.58*	7	9.71	-0.16	0.03	-3.59	-0.77*
	3	8	8.13	-1.25	0.24	5	6.80	-3.08	0.54*	1.33	0.33
	4	5	8.60	-0.78	0.13	6	8.17	-1.71	0.31	0.43	0.10
	5	5	7.00	-2.38	0.38	3	6.33	-3.54	0.54*	0.67	0.10
Avoid.C	1	8	3.63			8	3.25			0.38	0.12
-VA	2	8	3.38	-0.25	0.07	7	3.29	0.04	-0.01	0.09	0.03
	3	8	2.63	-1.00	0.36	5	2.00	-1.25	0.45	0.63	0.31
	4	5	1.80	-1.83	0.67*	6	4.50	1.25	-0.33	-2.70	-0.79*
	5	5	4.20	0.58	-0.17	3	2.33	-0.92	0.29	1.87	0.58*

Note. T = Time, with 1 = Pre-treatment, 2 = Post-treatment, 3 = 1st follow-up, 4 = 2nd follow-up, 5 = 3rd follow-up. T-T1 = Difference between mean at pre-treatment and mean at subsequent Time. Diff = AT Mean – ACT Mean.

*medium effect size, **large effect size.

APPENDIX E

Table of Expectancies for the Program and Table of Post-treatment and Follow-up Assessment of Skills Practice

Table E.1.

Extent Expectancies for the Program were Met Across Assessments for Each
Group

Extent distress from work-related stressors reduced						
Time	<i>U</i>	<i>p</i>	AT		ACT	
			<i>n</i>	<i>Mdn</i>	<i>n</i>	<i>Mdn</i>
Post	17.50	.934	6	4.50	6	4.00
1 st FU	23.50	.594	8	3.00	7	3.00
2 nd FU	14.00	.492	6	4.00	6	3.50
3 rd FU	4.00	.282	5	3.00	3	4.00
Extent distress from stressors outside of work reduced						
Post	12.00	.394	6	4.50	6	5.00
1 st FU	19.00	.282	8	3.50	7	2.00
2 nd FU	10.00	.167	6	4.00	6	4.50
3 rd FU	3.00	.167	5	2.00	3	4.00
Extent satisfaction or fulfillment in work increased						
Post	14.00	.589	6	3.50	6	4.00
1 st FU	23.50	.588	8	3.00	7	2.00
2 nd FU	17.00	.858	6	3.00	6	3.00
3 rd FU	2.00	.079	5	3.00	3	2.00

Table E.1. Continued

	Extent satisfaction or fulfillment in life increased					
Post	14.00	.589	6	4.00	6	4.00
1 st FU	26.50	.858	8	3.00	7	3.00
2 nd FU	12.00	.309	6	4.00	6	4.50
3 rd FU	4.50	.365	5	3.00	3	5.00

Table E.2.

Post-treatment and Follow-up Assessment of Skills Practice for each Group

Awareness of Your Experience, Your Mind on a Card, Tin Can Monster, or Observer Exercise?			
	AT	ACT	
Time	<i>n</i> Indicating Yes	<i>n</i> Indicating Yes	<i>p</i> (Fisher's Exact Test)
Post	7 of 8 (87.5%)	6 of 8 (75.0%)	1.000
1 st FU	4 of 8 (50.0%)	5 of 7 (71.4%)	.608
2 nd FU	4 of 6 (66.7%)	1 of 6 (16.7%)	.242
3 rd FU	2 of 5 (40.0%)	2 of 3 (66.7%)	1.000
Other acceptance/mindfulness practice(s) from program or other practice(s) made up or learned outside of the program?			
Post	4 of 8 (50.0%)	6 of 8 (75.0%)	.608
1 st FU	3 of 8 (37.5%)	4 of 7 (57.1%)	.619
2 nd FU	2 of 4 (33.3%)	3 of 6 (50.0%)	1.000
3 rd FU	2 of 5 (40.0%)	2 of 3 (66.7%)	1.000
Other stress reduction/management strategies?			
Post	2 of 8 (25.0%)	5 of 8 (62.5%)	.315
1 st FU	4 of 8 (50.0%)	4 of 7 (57.1%)	1.000
2 nd FU	3 of 6 (50.0%)	5 of 6 (83.3%)	.545
3 rd FU	0 of 5 (0.0%)	3 of 3 (100.0%)	.018

APPENDIX F**Working with Stress - Manual Adherence Checklist**

TAPE ID: _____

Rater ID: _____

Indicate whether or not each concept listed was discussed in this session and the extent the discussion followed the wording and actions specified in the manual:

	Concept	Discussed?	Adherence
1	Participants' experience of internal and external sources of stress	Y - N	Min Mod High
2	Aim of program is not to change the sources of stress, but how participants react to stressful events	Y - N	Min Mod High
3	What mind tells you to do to control external and internal stress, and how these solutions don't work	Y - N	Min Mod High
4	Mind's solutions to stress are actually the problem, paying attention to experience is the solution	Y - N	Min Mod High
5	Man in the Hole Metaphor	Y - N	Min Mod High
6	Distinguish blame from response-ability	Y - N	Min Mod High
7	Tug-of-War with a Monster Metaphor	Y - N	Min Mod High
8	Assignment of "How do you Struggle with Stress?" diary as homework	Y - N	Min Mod High

9	The Rule-of-Private Events: If you aren't willing to have it, you've got it	Y - N	Min Mod High
10	Polygraph Metaphor	Y - N	Min Mod High
11	Don't-Think-of-a-Chocolate-Cake Exercise	Y - N	Min Mod High
12	How the mind gets programmed with arbitrary rules	Y - N	Min Mod High
13	Rules of the Game of Life Exercise	Y - N	Min Mod High
14	Two Scales Metaphor	Y - N	Min Mod High
15	Willingness is an activity, an action, not a feeling or a thought; you can be willing even if you don't like the consequences	Y - N	Min Mod High
16	Quicksand Metaphor	Y - N	Min Mod High
17	Clean vs. Dirty Discomfort - Pain vs. Suffering	Y - N	Min Mod High
18	Box Full of Stuff Metaphor	Y - N	Min Mod High
19	Assigned "Rules of the Game of Life Exercise" homework	Y - N	Min Mod High
20	Assigned "Pain & Suffering Diary"	Y - N	Min Mod High
21	Your Mind is Not Your Friend Exercise	Y - N	Min Mod High
22	The problem with Reason-giving: Are you going to be right, or are you going to be happy?	Y - N	Min Mod High
23	And vs. But Exercise	Y - N	Min Mod High
24	Bad Bottle Metaphor – Confusing evaluation with description	Y - N	Min Mod High

25	Passengers on the Bus Metaphor	Y - N	Min Mod High
26	Milk, Milk, Milk Exercise	Y - N	Min Mod High
27	The Parade/Leaves on a Stream Exercise	Y - N	Min Mod High
28	What Mindful Acceptance is and is not	Y - N	Min Mod High
29	Assigned “Practicing Awareness of Experience” homework	Y - N	Min Mod High
30	Assigned “Your Mind on a Card” homework	Y - N	Min Mod High
31	Tin Can Monster Exercise	Y - N	Min Mod High
32	Chessboard Metaphor	Y - N	Min Mod High
33	Observer Exercise	Y - N	Min Mod High
34	Review of mindfulness components of program and their usefulness for work stress	Y - N	Min Mod High
35	Assigned “Observer Exercise” homework	Y - N	Min Mod High
36	Assigned “Tin Can Monster Exercise” homework	Y - N	Min Mod High
37	Emotions and thoughts as language-based barriers to living according to our values	Y - N	Min Mod High
38	Defining a “value” as a compass heading and “valuing” as taking action in that direction	Y - N	Min Mod High
39	Write Your Own Epitaph Exercise	Y - N	Min Mod High
40	Goals are concrete obtainable events, situations, or objects.	Y - N	Min Mod High
41	Following our values does not mean our paths are always straight and problems don’t come up, so	Y - N	Min Mod High

	taking perspective and making a commitment is needed		
42	My Work-Life Values Exercise	Y - N	Min Mod High
43	Work-Related Values, Goals, Actions, and Barriers Assessment	Y - N	Min Mod High
44	Assigned continued work on “My Work-Life Values” and “My Work-Life Values, Goals, Actions, and Barriers Assessment” as homework	Y - N	Min Mod High
45	Encouraged “What Do You Want Your Life to Stand For?” and “Full-Life Values Assessment” exercises as homework	Y - N	Min Mod High
46	Identify barriers to committed action	Y - N	Min Mod High
47	Willingness to observe and acknowledge barriers can support commitment	Y - N	Min Mod High
48	Joe the Bum Metaphor	Y - N	Min Mod High
49	Willingness to commit as the necessary first step toward your desired outcome	Y - N	Min Mod High
50	Three culprits that contribute to your failure to complete committed actions	Y - N	Min Mod High
51	The ACT on FEAR Card Exercise	Y - N	Min Mod High
52	Every single moment you are building behavioral patterns, think of your own ways to practice mindful acceptance	Y - N	Min Mod High

Indicate the extent to which the facilitator(s) ran the session in the manner specified:

1	Discussed homework from previous session at start of this one	Not at all	Min	Mod	High
2	Expressed idea that she is in the same boat as participants and spoke from an equal and genuine point of view	Not at all	Min	Mod	High
3	Was compassionate towards participants distress and avoided judgment	Not at all	Min	Mod	High
4	Encouraged participants to pay attention to their own experience	Not at all	Min	Mod	High
5	Argued or attempted to convince the participants of things	Not at all	Min	Mod	High
6	Explained the meaning of metaphors rather than having group figure them out <i>[leave blank if no metaphors presented]</i>	Not at all	Min	Mod	High
7	Disclosed personal experiences or issues appropriate to the discussion	Not at all	Min	Mod	High

BIOGRAPHY OF THE AUTHOR

Barbara Hermann was born Barbara Wszola in Wadowice, Poland, on October 9, 1974. She immigrated to the United States with her parents and brother in 1981 and resided in Portland and South Portland, Maine, graduating from South Portland High School in 1992. She attended the Pennsylvania State University, graduating with a Bachelor's of Science degree in Psychology in 1996 and with a Master's of Science degree in Kinesiology in 2000. Barbara returned to Maine and after working as a clinical trials coordinator at St. Joseph's Hospital in Bangor, she entered the Psychology doctoral program at the University of Maine in the fall of 2002.

During her graduate career, Barbara first authored two and co-authored seven professional publications. She also presented eight first-author professional presentations and contributed to eight others. Barbara has also been the recipient of several academic honors, including the University of Maine Provost Fellowship during her initial year of doctoral study, a University of Maine Summer Graduate Research Fellowship in 2005, and a Graduate Trustee Tuition Scholarship in 2006.

After completing her doctoral degree requirements, Barbara will be working as a Postdoctoral Fellow in Clinical Psychology at the Togus VA Medical Center in Togus, Maine. She is a candidate for the Doctor of Philosophy degree in Psychology from The University of Maine in December, 2008.