THE ACCEPTANCE OF COMPLEXITY: EFFECTS ON PSYCHOLOGICAL WELL-BEING AND RESILIENCE

Paul M. Miceli

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Approved by:

Melanie C. Green

Barbara L. Fredrickson

B. Keith Payne

Sara B. Algoe

Abigail T. Panter

ABSTRACT

PAUL M. MICELI: The Acceptance of Complexity: Effects on Psychological Well-Being
and Resilience
(Under the direction of Melanie C. Green)

Struggling with complexity in the world can lead to depressed affect, rumination, and multiple other negative psychological and physical health outcomes (see Andrews & Thompson, 2009, for a review). This dissertation explores the other side of coping with complexity using a new construct termed the acceptance of complexity (AoC), which is defined as the willingness to experience complex situations without judgment or avoidance. It is hypothesized that AoC affects positive aspects of psychological well-being and resilience. The ultimate goal of this new program of research is to develop an intervention that increases AoC, and to demonstrate that this increase leads to better psychological well-being and resilience. Two studies focused on the beginning stages of this ultimate goal. Study 1 developed a 10-item scale measuring individual differences in AoC, and the scale was partially validated in Studies 1 and 2. AoC was conceptually and empirically distinct from similar constructs (e.g., Intolerance of Uncertainty, Psychological Acceptance, Need for Closure), and it was correlated with multiple aspects of positive psychological well-being and resilience (e.g., higher satisfaction with life and dispositional resilience; lower depression and anxiety symptoms). Study 2 attempted to manipulate AoC and tested the effects of the manipulation on state-level resilience. The manipulation failed to show significant differences between experimental groups. Methodological limitations that may have affected the test of the manipulation are discussed. Study 2 also identified ambiguity tolerance, which

is conceptually similar to AoC, as an important variable related to state-level resilience and other psychological well-being variables (e.g., ego-resiliency and positive emotionality), suggesting that future research in this area should also consider this construct in addition to AoC. This research began to illuminate the relationship between AoC and psychological well-being and resilience. With this foundation, future research can begin to develop short- or long-term interventions meant to increase AoC.

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This document represents so much more than the simple reporting of two studies from a new program of research. It represents the culmination of five years of graduate work that often went unseen: teaching undergraduate courses, taking classes, mentoring students, studying for comprehensive exams, and struggling with academic and personal challenges. The completion of this work was only made possible by the incredible support group that I had around me, starting, first and foremost, with my incredible wife, Dr. Melissa Miceli. Even three years apart at the beginning of this journey could not stifle my love and admiration for her.

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CHAPTER 1

INTRODUCTION

The world can be a very complex place. Many situations and problems involve multiple moving parts or points of view – issues that seemingly have no easy or clear cut solution and can often be hard to understand or fully explain. For example, what caused the economic crisis and how do we fix it? Why can't the Israelis and Palestinians come to a workable peace agreement after such a long conflict? Or how does any one person end up in a certain place at a certain point in time?

People are presented with complex problems and situations on a daily basis, and although complexity itself is not necessarily hypothesized to positively or negatively affect an individual's psychological well-being, it has been found that *struggling* with complexity in the world can lead to depressed affect, rumination, and multiple other negative psychological and physical health outcomes (see Andrews & Thompson, 2009, for a review). Specifically, people, particularly those in dysphoric moods, engage in ruminative behavior because they believe that it will give them new insight into the complex problems that they are struggling to resolve (Lyubomirsky & Holen-Hoeksema, 1993; Watkins & Baracaia, 2001). Increased rumination can then lead to a decreased focus on and greater inability to concentrate on other tasks or problems, making it less likely that one will engage in other activities that might actually increase their mood (Andrews & Thompson, 2009).

If struggling with complexity can lead to increased rumination and other potential negative consequences in an attempt to resolve this complexity, then, it seems fruitful to consider the other side of coping with complexity, namely, how people *accept* complexity in the world, in order to explore the positive effects or consequences related to complexity. It is hypothesized that acceptance of complexity in the world affects positive aspects of psychological well-being and resilience. The first main goal of this research is to develop a measure of individual differences in acceptance of complexity and explore its connection to constructs related to psychological well-being and resilience. Once these connections are established, the second goal is to manipulate acceptance of complexity and test the short-term effects for psychological well-being (e.g., increased resilience to negative events, momentary positive emotions). The two studies reported here act as the first steps for a new program of research with the aim of developing a quick, efficient intervention for increasing acceptance of complexity and, subsequently, the associated aspects of psychological well-being and resilience.

Simplifying a Complex World

The world can appear to be a very complex place, and at any given time humans are confronted with an almost infinite amount of information to process in order to make sense of the world. Our brains are hard-wired to break down all of this complex information into something that we can readily understand. We rely on schemas to aid in quick and efficient information processing in order to form expectations about social situations and make quicker inferences (Fiske & Linville, 1980; Fiske & Taylor, 1991; Mayer, Rapp, & Williams, 1993). These schemas also affect what we actually remember and how we use that information in the future (Sherman, Judd, & Park, 1989; Cano, Hopkins, & Islam, 1991;

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Higgins & Bargh, 1987). Furthermore, people simplify and summarize complex information into smaller, easier to understand segments (e.g., Gilovich, 1987; Inman, Reichl, & Baron, 1993). Although these types of effects show that it is a natural cognitive tendency for people to simplify complex information, they do not address how much an individual accepts and is comfortable coping with complexity. This dissertation focuses on these important individual differences in accepting complexity.

Biased Processing, Psychological Well-Being, & Acceptance of Complexity

It is no surprise that humans struggle to deal with complex situations, questions, and problems. We are generally motivated to find meaning and come up with accurate portrayals of the world, especially in ambiguous, uncertain, or crisis situations (Baron, Vandello, & Brunsman, 1996; Sherif, 1936), and complexity makes our search for accuracy much more difficult (Kaplan & Miller, 1987).

It is important to note, however, that accuracy is not always the most prominent motivator of human thought and behavior. In fact, human judgment is often based on biased information processing and cognitive heuristics (see Fiske & Taylor, 1991; Nisbett & Ross, 1980, for reviews). This type of processing can increase efficiency but can also lead to judgmental errors and biased conclusions, often influenced by prior expectations and conclusions that favor the self. These errors and biases are so prominent and important that researchers have argued that relying on them, especially ones that support individuals' self-esteem – defined as positive illusions – are an essential component to healthy psychological functioning (Taylor & Brown, 1988; Taylor & Brown, 1994), although others have argued this contention (Colvin & Block, 1994).

This analogy to the positive illusion literature serves to illustrate the theory that healthy psychological functioning, and the processes underlying it, is not simply based on a motivation for accuracy. In the case of healthy psychological functioning related to thinking about and coping with complexity, I posit that it is less about forming accurate portrayals of complex situations and more about *accepting* the complexity that exists. It is the willingness to experience complex situations without judgment or avoidance that should lead to healthy psychological functioning.

<div align="center">Acceptance of Complexity Compared to Related Constructs</div>

The acceptance of complexity shares conceptual links to three major literatures, namely, those focusing on intolerance of uncertainty, psychological acceptance, and mindfulness. For instance, a non-acceptance of complexity may lead people to feel uncertainty – uncertainty about how things work, why we are here, or what the best course of action is. There is ample literature suggesting that uncertainty, or more specifically, an intolerance of uncertainty, can lead to excessive worrying, anxiety, depression, and many other negative psychological health outcomes (see Koerner & Dugas, 2006, for a review).

Acceptance of complexity is not conceptualized as merely the opposite of intolerance of uncertainty, however. Complexity involves an intricate or complicated set of interconnected parts, but it does not require that the situation or problem be uncertain, indeterminate, or imprecise. Nevertheless, it is quite possible that the type of complexity that individuals have trouble accepting is partially conflated with uncertainty. For example, thinking about one's future career trajectory can be an anxiety producing exercise not only because it involves a complex interplay of many different variables (e.g., one's professional skills, family situation, job market) but also because it is an uncertain situation. Being able to

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accept complexity in the world and in one's own life avoids the negative repercussions of uncertainty. If it does not bother you that situations or problems may be complex, or that you may not be able to understand how it all works or will work, then you will be less likely to worry or ruminate about these situations.

Acceptance of complexity is also related to psychological acceptance and mindfulness. Acceptance of complexity, at its core, is a more specific and targeted form of the overall process of psychological acceptance. Psychological acceptance (or simply *acceptance*) has been defined as the "willingness to experience thoughts, feelings, and physiological sensations, especially those which are negatively evaluated (e.g., fear), without having to avoid them or let them determine one's actions" (Bond & Bunce, 2003, p. 1057). Thus acceptance of complexity can also be thought of as being willing to experience complex situations, and emotions arising from having to cope with these situations, without having to avoid them or have them determine one's actions.

This last idea about not having to avoid complex situations or letting them determine one's actions is a main component of mindfulness, or present moment awareness. The concept of mindfulness, historically based on Buddhist meditation practices, has been defined in various different ways (see Kabat-Zinn, 2003, for a discussion), but the operational definition for the purposes of this dissertation is a nonjudgmental or open-minded approach of focusing on or being aware of the present moment (Kabat-Zinn, 2003; Baer, 2003). Those more accepting of complexity can be seen as being more nonjudgmental or open-minded toward complex situations, although it is not a necessity to focus on present moment awareness. These last two concepts, acceptance and mindfulness, and their connections to acceptance of complexity will be discussed in greater detail below.

Resiliency

Resiliency is one component of psychological well-being that is hypothesized to be particularly related to the acceptance of complexity. Resiliency (or hardiness), defined here as an individual's ability to "bounce back" from negative events and positively adapt and adjust to changing situations, is an important factor in sustained positive well-being (Hull, Van Treuren, & Virnelli, 1987; Block & Kremen, 1996). It is related to better adjustment and effective functioning (Klohnen, 1996), faster cardiovascular recovery (Tugade & Fredrickson, 2004), and better social support and active coping (Eschleman, Bowling, & Alarcon, 2010), amongst various other positive constructs and outcomes (see Cohn, Fredrickson, Brown, Mikels, & Conway, 2009; Eschleman et al., 2010, for reviews).

Resiliency has been measured in various different ways. For example, trait-level resiliency has been assessed using measures of ego-resiliency and dispositional resilience. Ego-resiliency refers to an individual's ability to positively adapt and adjust to ever-changing situations in order to maintain personal stability and equilibrium, and it is measured by the ego-resiliency scale (Block & Kremen, 1996). This scale includes items such as *"I quickly get over and recover from being startled"* and *"I get over my anger at someone reasonably quickly."* Dispositional resilience refers to an individual's belief in a personal sense of purpose, personal sense of control, and to how an individual construes changes and challenges, and it measured by the dispositional resilience scale (Bartone, Ursano, Wright, & Ingraham, 1989). This scale includes three subscales with items such as "*By working hard you can always achieve your goals* (commitment subscale)," "*What happens to me tomorrow depends on what I do today* (control subscale)," and "*I like it when things are uncertain or unpredictable* (challenge subscale)." These two measures are included in the following

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studies in order to show the relationship between trait-level resiliency and acceptance of complexity.

In addition to these specific measures of resiliency, there are also multiple related variables that are frequently used as indicators for an individual's level of resiliency, such as acceptance (Siebert, 1996; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002), mindfulness (Thompson, Arnkoff, & Glass, 2011), positive emotions (Cohn et al., 2009; Tugade & Fredrickson, 2007), and optimism (Chang, Maydeu-Olivares, & D'Zurilla, 1997), amongst various others (see Southwick, Vythilingam, & Charney, 2005, for a review). Another common variable highly associated with resiliency and often used as an indicator of or proxy for resiliency is the ability to reappraise or reframe negative experiences, such as finding positive meaning in a difficult event (Southwick et al., 2005). For example, resilient individuals are more likely to reappraise potentially stressful events and think about them in less-threatening ways (Kobasa, 1979), and they are more likely to find positive meaning in a current problem that is troubling them (Tugade & Fredrickson, 2004). Measures of finding positive meaning in negative events act as good proxies for state-level resilience, showing how individuals are currently dealing with difficult situations. This type of measure is included in Study 2 in order to show the relationship between state-level resiliency and acceptance of complexity.

Additionally, it is useful to explore more about the variables related to positive meaning finding if this measure is going to be used as a proxy for state-level resilience in this study as well as in future studies. For example, Tugade and Fredrickson (2004) found that positive emotionality (a composite of general positive affect and specific positive emotions) mediated the relationship between ego-resiliency and positive meaning finding. A secondary

goal of Study 2 is to replicate this finding and identify other important constructs that might account for this particular relationship. Acceptance of complexity is hypothesized to be positively related to these aspects of psychological well-being, and it is thus a good construct to further explore in relation to these other variables.

As it pertains directly to the acceptance of complexity, the present research adds to the literature on resiliency and psychological well-being by, first, suggesting that this new construct of acceptance of complexity is positively related to trait-level resiliency (i.e., ego-resiliency and dispositional resilience). Second, and more importantly, this research aims to show that focusing more directly on acceptance of complexity can lead to positive changes in an individual's state-level resiliency (i.e., finding more positive meaning in negative events) and, subsequently, the positive aspects of psychological well-being associated with resiliency.

Acceptance

As mention earlier, acceptance of complexity can be seen as a more specific or targeted form of acceptance. Acceptance is based on Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), which is a clinical therapy that emphasizes not trying to control internal behavior and, instead, focusing on controlling overt actions. This method of focusing on acceptance tends to promote mental health and is commonly found to achieve positive outcomes in psychotherapy (e.g., Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Interventions or training techniques based on ACT have proven to be successful in affecting indicators related to resilience (e.g., increased positive emotion, mindfulness, acceptance, and self-acceptance, among others, and decreased stress; Burton, Pakenham, & Brown, 2010) and reducing work stress (Bond & Bunce, 2003; Flaxman &

Bond, 2010). ACT has also been hypothesized to be an effective training technique to increase crisis-resiliency, or the ability to cope with and effectively handle negative or stressful situations during a crisis (Moran, 2010).

Acceptance-based therapies partly arose from the intention to develop a technique to counteract experiential avoidance. Experiential avoidance, the broad term that encompasses more specific concepts such as emotional avoidance and cognitive avoidance, refers to the practice of escaping, avoiding, or attempting to modify one's thoughts, feelings, and physiological sensations (Hayes et al., 1996). Unhealthy or overuse of this practice is seen as a key contributor to many psychopathologies and negative mental health outcomes. Contrary to traditional behavioral and cognitive therapies, which tended to focus on changing or controlling negative thoughts, feelings, and sensations, acceptance-based therapies have been theorized to achieve positive outcomes by focusing on acceptance of these negative experiences and having people treat them as simply normal sensations and reactions, and not necessarily important aspects of one's identity that must be avoided or controlled. Many modern therapies such as ACT, dialectical behavior therapy, and mindfulness-based cognitive therapy (MBCT; discussed below) incorporate an emphasis on acceptance (see Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hayes et al., 1996; for reviews).

The main goal of ACT is to increase psychological flexibility, or "the ability to contact the present moment more fully as a conscious human being, and to change or persist in behavior when doing so serves valued ends" (Hayes et al., 2006, p. 7). Psychological flexibility is theorized to be connected to six core processes: acceptance, cognitive defusion, contact with the present moment (mindfulness), values, self as context, and committed action. Thus, focusing on acceptance is just one aspect of the overall therapeutic technique

thought to increase psychological flexibility and, subsequently, to promote mental health. The Acceptance and Action Questionnaire (AAQ-II; Bond et al., 2011) measures the ACT's effectiveness, and it is the most widely used measure of acceptance. The AAQ-II is highly negatively correlated with measures of depression, anxiety, and stress (see Hayes et al., 2006, for a review). The connection between Acceptance of Complexity and acceptance more generally, measured by the AAQ-II, will be explored in the second study of this dissertation.

Promoting acceptance (and not avoidance) of thoughts and feelings appears to be a fruitful strategy that can encourage positive well-being. The present research builds on the acceptance literature and focuses on accepting specific types of difficult or complicated situations: complexity in the world. I posit that this specific acceptance of complexity will be particularly related, over and above that of general acceptance, to resilience in dealing with negativity and uncertainty resulting from complex, difficult situations.

Mindfulness and Other Meditation Practices

As described in the previous section, acceptance-based therapies such as the ACT include techniques focused on increasing acceptance as well as additional techniques focused on other core processes related to psychological flexibility. One such process, present moment awareness or *mindfulness*, has recently gained additional exposure and empirical support in the literature. Mindfulness meditation practices teach people how to better focus their attention on the present moment in this nonjudgmental way.

Recent reviews show that mindfulness meditation and mindfulness-based cognitive therapies (MBCT) can be an important factor in helping people regulate many negative experiences as well as increasing positive experiences (Baer, 2003; Kabat-Zinn, 2003; Segal, Williams, & Teasdale, 2002). For example, Teasdale and colleagues (2000) found that

MBCT reduced the risk of relapse/recurrence to major depression in recovered recurrently depressed patients. Additionally, MBCT have proven to be successful affecting indicators related to resilience in children (increased social-emotional resilience evidenced by decreases in attention problems, anxiety symptoms, and behavior problems; Semple, Lee, Rosa, & Miller, 2010) and adults with a life-time history of depression (increased momentary positive emotions and reward experience; Geschwind, Peeters, Drukker, van Os, & Wichers, 2011). Coholic (2011) also found promising preliminary qualitative evidence that arts-based methods employing mindfulness techniques can be a way to increase resilience in young people in need. Acceptance of complexity is thought to be connected to present moment awareness and mindfulness because of the close connection to overall psychological flexibility as well as the overlapping effects of interventions meant to increase acceptance and mindfulness. Although mindfulness was not measured in the following studies, implications for mindfulness meditation techniques are further elaborated in the general discussion.

Additionally, other related meditation techniques, such as loving-kindness meditation (LKM), are thought to be important to resilience, psychological well-being, and psychological flexibility as well. LKM is a practice that helps people increase and strengthen feelings of multiple positive emotions, such as love (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). It teaches people to direct their feelings towards oneself and others in an open-hearted way. Recent evidence has shown that LKM is also successful in affecting indicators related to resilience (e.g., increased daily positive emotions, mindfulness, and purpose in life, among others, and decreased illness symptoms, Fredrickson et al., 2008).

Overall, ACT, MBCT, LKM, and other similar therapies and interventions based on acceptance and mindfulness appear to promote many of the important indicators of resilience and psychological well-being that the acceptance of complexity is theorized to promote. All of these methods seem worthy of recommendation to not only those dealing with diagnosable psychopathologies but also to anyone seeking increased mental health and positive emotions. A drawback of these types of interventions, however, is the lengthy time and energy commitment normally required to observe long-term positive outcomes. For example, ACT-based interventions involve detailed workbooks and 11 weekly workshops over a 13-week period (Burton, Pakenham, & Brown, 2010), MBCT involve eight weekly workshops lasting 2.5 hours each and daily homework and meditation assignments (Geschwind, Peeters, Drukker, van Os, & Wichers, 2011), and LKM interventions involve at least seven weeks of meditation (at least three to five times per week) with weekly hour-long workshops (Fredrickson et al., 2008).

Therefore, one of the main purposes of this dissertation is to explore the possibility that targeting a more specific form of acceptance will provide an easier and more efficient avenue to these long-term outcomes. This goal will be accomplished by creating a measure of acceptance of complexity, manipulating it, and testing the immediate effects on resilience and positive well-being. With this foundation, future research could work to develop a short and efficient intervention meant to boost both short- and long-term acceptance of complexity.

The Present Research: Hypotheses and Goals

With this background, I posit that those more likely to accept complexity would be better able to cope with negative events in the world and in their own lives because they acknowledge that there are many ways to construe a situation and that some situations may

not have a readily available or easy explanation. This would lead people to be more resilient in the face of adversity and, subsequently, to experience less anxiety and depression. They will generally be more optimistic about themselves and the world and ruminate less about negative events because they accept that there is no easy answer or quick fix for difficult problems and situations. A de-emphasis on negative events, coupled with reduced negative health outcomes (e.g., anxiety and depression), should lead to a greater overall satisfaction with life and increased experience of positive emotions and positive affect.

The ultimate goal of this program of research is to develop an intervention that increases people's acceptance of complexity, and to demonstrate that this increase subsequently leads to greater resilience and better overall psychological functioning. The present research is focused on the beginning stages of reaching this goal. Namely, Study 1 develops a measure of acceptance of complexity and shows its correlations with important measures of psychological well-being (e.g., resilience, satisfaction with life, anxiety, depression). Study 2 attempts to manipulate acceptance of complexity and tests the effects of this manipulation on a state-level resilience measure (i.e., finding positive meaning in negative events). All of these objectives are important to the future development of a short- or long-term intervention that focuses on increasing acceptance of complexity.

CHAPTER 2

STUDY 1: DEVELOPING ACCEPTANCE OF COMPLEXITY SCALE

In order to eventually manipulate and implement an intervention meant to increase acceptance of complexity, a scale must first be developed to measure this construct. Additionally, the scale must predict important indicators of psychological well-being (e.g., positive correlations with satisfaction with life and resilience; negative correlations with anxiety and depression) and be distinct from similar constructs (e.g., intolerance of uncertainty and need for closure) if it is going to be a useful measure in future interventions. Thus, the main purpose of this study was to develop a short scale that measures how accepting an individual is of complexity in the world (AoC) and show its relationships with important psychological well-being measures as well as similar constructs. Common scale development techniques were used following the general recommendations outlined by DeVellis (2012).

Method

Participants

Participants were 177 (130 female, 46 male, 1 missing, 70.1% European-American/Caucasian, $M_{age} = 18.48$ years, $SD = 1.08$) undergraduates from the University of North Carolina at Chapel Hill who were enrolled in an introductory psychology course. Participants received credit toward partial fulfillment of their class research requirement.

Measures

Acceptance of Complexity Scale. A pool of 32 items was generated for the goal of eventually constructing a short (6-13 item) measure of acceptance of complexity. I first began generating the item pool by thinking deeply about the definition and conceptualization of the construct, discussed earlier, and writing items that epitomized that conceptualization. Then, I looked at multiple measures thought to be related to the acceptance of complexity (explained in greater detail below) and systematically went through them searching for items and concepts that were closely related to my definition. Many related items from these scales were selected and either paraphrased or rewritten as new items more consistent with the conceptualization of acceptance of complexity. A few redundant items were also included at this initial development stage in order to minimize the effect the wording of individual items may have on participant response.

I considered multiple different response formats modeled after similar measures and chose the following 6-point scale (with no explicit midpoint): *1 – Strongly disagree, 2 – Moderately disagree, 3 – Slightly disagree, 4 – Slightly agree, 5 – Moderately agree, 6 – Strongly agree*. Here are the instructions:

> Please read the following statements and rate how much you agree with each of them based on your own thoughts, feelings, and actions. There are no "right" or "wrong" answers. We are simply interested in how different people think and feel.

After the item pool was generated and the instructions and response format was set, the development scale was reviewed by Social Psychology graduate and undergraduate students familiar with the definition and conceptualization of acceptance of complexity in order get an outside perspective on the scale and items. Multiple items were revised or clarified in response to their comments and critiques, resulting in the 32-item development

scale used in this study (Appendix A).

   Construct and Criterion Validation Measures. Measures of well-being, resilience,

optimism, and cognitive preference were included as an initial test of construct and criterion

validity. Positive well-being was assessed using the 5-item Satisfaction with Life Scale

(SWLS, α = .84; e.g., *"In most ways my life is close to my ideal"*; Diener, Emmons, Larsen,

& Griffin, 1985). Negative well-being was assessed using the 9-item PHQ-9 depression scale

(α = .84; e.g., *"Over the last two weeks, how often have you been bothered by…feeling down,*

depressed, or hopeless?"; Kroenke, Spitzer, & Williams, 2001) and the 5-item Overall

Anxiety Severity and Impairment Scale (OASIS, α = .84; e.g., *"In the past week, how often*

have you felt anxious?"; Norman, Cissell, Means-Christensen, & Stein, 2006). Optimism was

assessed using the 6-item revised version of the Life Orientation Test (LOT-R, α = .78; e.g.,

"I'm always optimistic about my future"; Scheier, Carver, & Bridges, 1994).[1]

   Trait-level resiliency was assessed using two different measures. First, ego-resiliency

was assessed using the 14-item ER-89 (α = .78; Block & Kremen, 1996). Ego-resiliency

refers to an individual's ability to positively adapt and adjust to ever-changing situations in

order to maintain personal stability and equilibrium. Second, dispositional resilience was

assessed using the 30-item short form of the Dispositional Resilience Scale (DR, α = .72;

Bartone et al., 1989). This scale has three distinct 10-item subscales: Commitment (α = .68),

Control (α = .47), and Challenge (α = .65). The commitment subscale reflects an individual's

belief in a personal sense of purpose in their life and work. The control subscale reflects an

individual's belief in a personal sense of control over their life and actions. The challenge

subscale reflects how much an individual construes changes and challenges as opportunities

to learn and explore versus threats to one's safety or status quo.

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[1] The administered scale includes 10 items, four of which are filler items.

The 18-item Need for Cognition Scale (NfCog, α = .86; e.g., *"I find satisfaction in deliberating hard and for long hours"* and *"I really enjoy a task that involves coming up with new solutions to problems"*; Cacioppo, Petty, & Kao, 1984) measures how much an individual enjoys engaging in effortful thought. The 42-item Need for Closure Scale (NfClo, α = .86; Webster & Kruglanski, 1994) measures an individual's need to avoid uncertainty and have stable knowledge of concepts. The Need for Closure Scale has five aptly-named facets: Preference for Order (α = .80; e.g., *"I think that having clear rule and order at work is essential for success"*), Preference for Predictability (α = .77, e.g., *"I don't like to go into a situation without knowing what I can expect from it"*), Decisiveness (α = .80; e.g., *"I usually make important decisions quickly and confidently"*), Discomfort with Ambiguity (α = .68, e.g., *"I don't like situations that are uncertain"*), and Close-mindedness (α = .70, e.g., *"I do not usually consult many different opinions before forming my own views"*). Finally, the 27-item Intolerance of Uncertainty Scale (IUS, α = .93; e.g., *"Uncertainty makes life intolerable"* and *"Uncertainty makes me uneasy, anxious, or stressed"*; Buhr & Dugas, 2002) measures how much an individual deems uncertainty as being unacceptable and how much one is bothered by ambiguous or uncertain situations that may lead to negative outcomes. The IUS is highly positively correlated with excessive worrying and anxiety, and it has been used as a diagnostic tool for generalized anxiety disorder.

Additionally, a short version of the Marlowe-Crowne scale was used to assess social desirability (α = .55; participants responding *true* to the following statements score higher in social desirability: *"I never resent being asked to return a favor"* and *"I have never been irked when people expressed ideas very different from my own"*; Strahan & Gerbasi, 1972). Table 1 shows the predicted correlations between the resulting Acceptance of Complexity

Scale and the included validation measures. In short, those more accepting of complexity were expected to be more resilient in the face of negative events and adversity (positive correlations with the ER-89 and DR), which in turn would lead to overall greater satisfaction with life and higher levels of optimism for the future (positive correlations with the SWLS and LOT-R) and lower levels of depressive and anxiety symptoms (negative correlations with the PHQ-9 and OASIS). If complexity does not bother those high in AoC, they are also likely to enjoy and engage in effortful thought (positive correlation with NfCog) and not necessarily avoid uncertainty (negative correlation with NfClo). Finally, those more accepting of complexity should be more tolerant of uncertainty in general (negative correlation with IUS).

Instructional Manipulation Check. In order to detect and potentially avoid satisficing (Krosnick, 1991) by participants taking the study, an instructional manipulation check was included at the beginning of the survey. Participants were initially presented with the following instructions and task:

> Before you start the survey, we would like to give a brief description of "online academic research" and then simply ask you if you have ever been in an online academic research study before this one. Please read the entire description below before you move on.
> Online academic research studies are those in which researchers at an academic institution have a research question that they want the answer to, often requiring the perspective and experience of several (or several hundred) people from a cross-section of society. One straightforward way to ask a wide range of people questions is to post the survey (study) online. One drawback to this method is that a handful of people in these studies do not read instructions completely, and so to make sure that our results are valid, we have included this question. Please ignore (and do not answer) the question about whether you have participated and instead write in the text box that you have read these instructions. The consent form that you read when you clicked on the link to this study is a standard way to ensure that participants' best interests are taken into consideration during the conduct of this research study. Have you ever participated in an online academic research study prior to this one?

Participants were then presented with the option to choose either "Yes" or "No."

There was also a text box labeled "Additional Comments" in which participants were free to

write whatever they liked. Those who fully read the instructions above would eschew

answering the simple Yes/No question and instead write "I have read these instructions" in

the text box. Those who incorrectly answered the Yes/No question were directed to another

screen with the following statement:

> Thank you for your interest in participating in this study. Your
> response to this question indicates that you did not read the instructions
> completely.
> Unfortunately, this would typically cause us to not accept your work
> once we get the results. However, we want to be sure to give you another
> chance to read the text completely. The next page contains the same
> information and questions that you just saw.
> Please re-read the instructions completely before proceeding; we will
> ignore your previous response and accept your work once we get the results if
> it is clear that you read completely during the rest of the questionnaire,
> starting with this 2nd chance. Click on the arrow to start over.

These participants were then directed back to the original instructional manipulation

question with the same instructions and response options. Those who failed this instructional

manipulation check a second time, after the explicit statement detailing how and why they

had failed the manipulation check, were excluded from the analyses.

Procedure

All data were collected using the online Qualtrics research suite. Participants

first completed an informed consent form, and then they were immediately directed to the

instructional manipulation check measure. If they correctly answered the manipulation check,

they then began answering the 32-items included for the development of the Acceptance of

Complexity Scale. They then completed the remaining measures in the following order:

Satisfaction with Life Scale, Life Orientation Test-Revised, Ego-Resiliency, Dispositional

Resilience, PHQ-9 Depression Symptoms, Need for Cognition Scale, Overall Anxiety

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Severity and Impairment Scale, Need for Closure Scale, Intolerance of Uncertainty Scale, and the short Social Desirability Scale. All items within each scale were presented to participants in random order. Finally, participants completed demographic questions. After completion of the study, participants viewed an online debriefing form.

CHAPTER 3

STUDY 1 RESULTS

Eighty eight participants (49.7%) failed the initial instructional manipulation check, which is common in my experience for online studies using this manipulation check. A further 14 participants failed the instructional manipulation check twice in a row and were excluded from all reported analyses, leaving 163 participants (121 female, 41 male, 1 missing, 69.9% European-American/Caucasian, $M_{age} = 18.49$ years, $SD = 1.10$) included in the reported analyses.

Acceptance of Complexity Scale

Initial reliability for the full 32-item scale was $\alpha = .83$. To create an acceptable short scale, I first looked at individual bivariate correlations between the items. Items were excluded that did not have a significant positive correlation with the item that was the best face-valid example of the conceptualization of the scale, "I accept that the world is a complex place." The following items were excluded: 13, 14, 17, 18, 19, 21, 22, 24, 25, 27, 28, 29, 30, and 32. The resulting 18-item scale had a reliability of $\alpha = .84$. Next, I considered the item-scale correlations and the additional variance each individual item contributed to the scale and excluded items with low correlations and small additions in variance. The following items were excluded: 20 ($r = .17$), 26 ($r = .21$), and 31 ($r = .09$). The resulting 15-item scale had a reliability of $\alpha = .86$. The scale was then examined from a conceptual standpoint. Two items were excluded (4 – "I'm okay with the unknown in the world" and 7 – "The unknown

in the world doesn't bother me") that appeared to be more related to constructs of uncertainty as opposed to simply complexity, an important conceptual distinction. The resulting 13-item scale had a reliability of α = .82. Finally, I again looked at the item-scale correlation and variance components of the remaining items and excluded three items: 2 (r = .20), 15 (r = .31), and 8 (r = .35; minimal additional variance). To improve interpretability of the scale score, the final ten items were averaged together, resulting in a score ranging from 1-6, with a mean of 3.5. The final 10-item scale had a reliability of α = .83 with M_{scale} = 4.49, SD = 0.75 (Table 2 for final scale).

<div align="center">Factor Analysis of AoC Scale</div>

Factor Analytic Strategy

Exploratory factor analyses (EFAs) were conducted in order to determine the underlying factor structure of the 10-item AoC Scale. All analyses were conducted using the PROC FACTOR procedure in SAS.[2] Four items were severely negatively skewed ("I accept that the world is a complex place"; "I'm okay with situations that require analyzing multiple points of view"; "I accept that some things in the world will never be fully explained"; and "I acknowledge that some problems don't have a straightforward answer") so they were transformed using an exponential transformation in order to normalize the data. The transformed variables were used in all EFAs.

It was hypothesized that the items would load on a single factor. EFAs were conducted with squared multiple correlations (SMCs) used as the communality estimates. Using SMCs on the diagonals is a good, conservative communality estimate because they give the lower bound for the communality in the population. Factors were extracted using the

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[2] As an alternative, one could conduct similar factor analyses using more specialized statistical packages such as Mplus (Muthén & Muthén, 2008). These programs account for ordinal data and allow for the calculation of standard errors (see Wirth & Edwards, 2007, for a discussion).

maximum likelihood method. This method was chosen so as to estimate the population parameters from the sample data. This process was done by maximizing the likelihood that the discrepancies between the model and the data were due to sampling fluctuations. Elements in the residual matrix were minimized in this process. Maximum likelihood estimation is consistent, asymptotically unbiased, asymptotically efficient, and asymptotically normal.

Factors were retained based on five criteria: 1) observation of the scree plot, 2) eigenvalue > 1 rule, 3) proportion of variance explained by the factor, 4) Tucker-Lewis Index (TLI) > .90 and 5) interpretability of factors. Analyses that retained more than two factors were subsequently rotated using quartimin rotation criteria. Quartimin is an oblique rotation that allows the factors to be correlated, which affords much greater flexibility in the solutions.

Factor Structure and Interpretation

An initial EFA of the 10-items yielded one large eigenvalue (6.52) and two other eigenvalues greater than one (1.35 and 1.08). Observation of the scree plot (Figure 1) suggested the retention of either one or three factors. Analyses were then conducted looking at one-, two-, and three-factor solutions. None of these factor solutions yielded good fit criteria: one-factor TLI = .62; two-factor TLI = .74; three-factor TLI = .86. Therefore, retention of factors was determined by the other four criteria listed above. One factor was subsequently retained based on the large proportion of variance explained by the factor (82%) and ease of interpretability. The two- and three-factor solutions explained a small amount of variance (17% and 14%, respectively) and the resulting factors were difficult to

interpret. Table 3 displays the factor loadings for the one-factor solution. The one-factor solution appears to fit the conceptualization of an overall acceptance of complexity.

Additionally, an EFA was conducted retaining four factors (fourth eigenvalue = 0.43, accounting for 5% of the variance) in order to potentially improve model fit and observe the resulting factor solution. The four-factor solution fit well (TLI = .97). Table 4 displays the factor loadings for the four-factor solution. Although the retention of four factors is not warranted based on the retention criteria, it was useful to explore the closer connections amongst the items.

The resulting factor structure offered further insight into the items. The factors could be termed "Not bothered by complexity" (Factor 1), "Acceptance of complexity and complicated situations and problems" (Factor 2), "Not bothered that the world will never be fully explained" (Factor 3) "Not bothered that some things are imperfect" (Factor 4). The four factors could be seen as subscales in future analyses using the AoC scale. Alternatively, the four factors could act as a guide for discarding redundant items on the scale in order to make a more parsimonious scale.[3] Although the four factor solution is useful in exploring the individual elements leading to an individual's overall acceptance of complexity, and it will continue to be considered in future studies, based on the retention criteria, only the one-factor solution will be further discussed.

Construct and Criterion Validation Measures

Table 5 shows the means, standard deviations, and bivariate correlations among all the included validity measures. Table 1 shows the predicted and actual correlations between

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[3] Further analyses were conducted eliminating the (redundant) items with the smallest loading on each factor, resulting in a 6-item scale. This 6-item scale produced the same pattern of correlations with the validation measures (discussed in the following section), but the reliability of the overall scaled dropped to $\alpha = .74$. Thus, the 10-item scale, including potential redundancies, may be a slightly more consistent and reliable predictor of important psychological well-being measures.

the 10-item AoC scale and each measure. All correlations between AoC and the validity measures were in the predicted directions. Specifically, there was a significant positive correlation ($p < .05$) between AoC and important facets of positive well-being and psychological health including satisfaction with life ($r = .24$), ego-resilience ($r = .18$), dispositional resilience ($r = .25$), and optimism ($r = .13$, marginal, $p < .10$). Additionally, there was a negative correlation between AoC and anxiety ($r = -.24$, $p < .01$) and depression ($r = -.14$, $p < .08$). There was a significant negative correlation ($p < .05$) between AoC and intolerance of uncertainty ($r = -.34$) and need for closure ($r = -.23$). There was also a marginal positive correlation between AoC and need for cognition ($r = .13$, $p = .10$). The only correlation not in the hypothesized direction was between AoC and social desirability ($r = .23$, $p < .05$).

Due to the potential similarity between the constructs of AoC and intolerance of uncertainty, as well as the fact that both measures predicted many of the same constructs (see Table 5), a standardized residual of AoC was computed for each participant partialing out the effect of the IUS. This standardized residual was not significantly correlated with many measures (e.g., ego-resilience, dispositional resilience, or anxiety), but it was significantly correlated with satisfaction with life ($r = .23$, $p < .01$) and discomfort with ambiguity ($r = -.19$, $p < .05$), suggesting that the IUS cannot account for the relationship between AoC and these measures.

CHAPTER 4

STUDY 1 DISCUSSION

Development of Acceptance of Complexity Scale

The main goal of Study 1 was to construct a short measure of acceptance of complexity that predicts both positive and negative aspects of psychological well-being. A 10-item scale was constructed following the general scale development techniques outlined by DeVellis (2012). Additional measures were also included in the study to begin the assessment of construct and criterion validity. As expected, the 10-item AoC scale positively predicts healthy well-being measures assessing satisfaction with life, resiliency, and optimism and negatively predicts anxiety and depression symptoms and tendencies. Additionally, as expected, it was a strong negative predictor of intolerance of uncertainty and need for closure. Although it did not significantly predict enjoying and engaging in effortful thought (need for cognition), the correlation was in the expected (positive) direction.

Finally, the only correlation not in line with predictions was AoC's correlation with the short social desirability scale (CM10). The correlation ($r = .23$) indicates that as an individual's motivation to respond in a social desirable fashion increases, so does their response on the AoC scale. The correlation is puzzling, considering that in a pretest sample ($N = 94$) using the same population (UNC undergraduates enrolled in PSYC 101), a prior version of the AoC scale, which included many identical or paraphrased items as the 10-item

scale from the current study, had no significant correlation with the same Social Desirability scale ($r = -.004$). Furthermore, many of the other measures included in this study, which have previously shown nonsignificant correlations with the same or similar social desirability scales, also had significant correlations with the short social desirability scale (e.g., IUS, $r = -.20$; NfCog, $r = .25$). The reliability of the scale was also quite low ($\alpha = .55$). This leads me to conclude that it may be something unique about the particular sample in this study or the overall unreliability of the social desirability scale, and not something inherently wrong with the AoC scale, which led to this correlation.

An additional important note about the development of the scale is that out of the ten items in the AoC scale, nine of them are positively worded. Multiple negatively worded items were included in the initial pool of 32 items, but all except for one were discarded in the scale development process. It has been found that scales and measures that share common method variance tend to be correlated (see Jaccard, Weber, & Lundmark, 1975). Thus, it is possible that a portion of the correlation between the AoC scale and some of the positive psychological well-being scales that shared similar method structure (e.g., satisfaction with life scale) could be attributed to this common method variance. Future research should consider developing an AoC scale that includes more negatively worded items to avoid this alternative explanation.

Overall, consistent with the main goal of Study 1, the 10-item AoC scale appears to be a good measure to assess the acceptance of complexity as originally conceptualized.

Acceptance of Complexity versus Intolerance of Uncertainty

One intriguing finding from Study 1 involved the Intolerance of Uncertainty Scale. The IUS predicted the same outcomes as the AoC scale, just in the opposite direction with

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stronger correlations: negative correlations with satisfaction with life, resilience, and optimism, and positive correlations with anxiety and depression symptoms. There is extensive research exploring the role of intolerance of uncertainty on worrying and anxiety, and it has been widely connected to the diagnosis and treatment of generalized anxiety disorder (see Koerner & Dugas, 2006, for a review). Most of the extant research takes a clinical focus, however, and looks at and measures negative emotions and negative aspects of psychological well-being (e.g., anxiety and depression).

The current research differs from the intolerance of uncertainty literature in two important ways. First, acceptance of complexity is defined as being conceptually different than intolerance of uncertainty. Instead of focusing solely on the unknown and the negative emotions and cognitions elicited from a lack of certainty, acceptance of complexity focuses not only on the positive aspects of acceptance (versus rejection) and *tolerance* of uncertainty but also on this broader notion of complexity, which doesn't presume a lack of confidence, precision, or non-ascertainable outcome. Complexity, alternatively, simply involves many interconnected parts that can be intricate or complicated, but not necessarily uncertain.

Second, this research is considering the effects of the constructs on positive aspects of psychological well-being, such as satisfaction with life, resiliency, and optimism. Despite the intended conceptual and empirical difference (only moderate correlation of $r = -.34$ between the two constructs, plus AoC still predicts some important measures after partialing out the shared variance with IUS), many people may link complexity with uncertainty, and thus the IUS may be an equivalent or even slightly better measure to investigate the goals of this research. Therefore, the following study also includes both the AoC scale and the IUS in order to determine if both constructs have similar or divergent effects, and if one construct is

a better predictor of important aspects of psychological well-being (both positive and

negative).

CHAPTER 5

STUDY 2: MANIPULATING ACCEPTANCE OF COMPLEXITY

Study 1 successfully developed a measure of individual differences in the acceptance of complexity that both predicted important measures of psychological well-being and was conceptually and empirically different from related measures. Study 2 builds on the first study and has four specific goals.

First, Study 2 aims to manipulate acceptance of complexity by using instructions telling participants to directly focus either on the acceptance of complexity or the acceptance of simplicity. It is hypothesized that those focusing more directly on accepting complexity in their lives will show increased state-level resilience, indexed by how much positive meaning participants find in a difficult negative event that they are currently dealing with.

Secondly, Study 2 aims to further validate the acceptance of complexity scale by observing correlations with related constructs not included in Study 1, such as general acceptance and ambiguity tolerance. Also, measures of ego-resiliency and intolerance of uncertainty are included to replicate the findings from Study 1. Additional analyses will build on Study 1 by observing the unique contribution of acceptance of complexity in explaining important measures of psychological well-being and resilience over and above that of related constructs (e.g., acceptance and intolerance of uncertainty).

The third goal of Study 2 is to identify further characteristics of and important variables related to state-level resilience, as measured by the positive meaning finding measure. Tugade and Fredrickson (2004) found that ego-resiliency was positively correlated with this measure, and positive emotionality (a composite of general positive affect and specific positive emotions) mediated the relationship between ego-resiliency and positive meaning finding. I will attempt to replicate these results and also go further by identifying any additional variables, such as acceptance of complexity or ambiguity tolerance, which may help to further account for or explain this important relationship. This is particularly important so that future research may better target the variables (through different manipulations or interventions) that are most likely to produce the expected results (e.g., increased state-level resilience through greater positive meaning finding).

The fourth and final goal of Study 2 is to explore the characteristics of participants' responses to the writing task (described below) that is the basis for the measure of state-level resilience. In this task, participants identify and write about their most important current personal problem. Tugade and Fredrickson (2004) briefly mentioned a couple characteristics of participants' responses to this task (e.g., the most frequent problem domain was romantic relationships; 74% of the sources of the problem occurred within the past month), but not much else is known about the emotional impact of the problem, seriousness of the problem, or linguistic characteristics of the written responses (e.g., word count, percentage of positive and negative words used). In Study 2, participants are asked directly about the domain of their writing as well as the emotional effect and seriousness of their problem. Textual analysis using word-count software is also used to identify additional linguistic characteristics. The data on these additional characteristics will help to inform future research

that uses this task. For example, a construct, such as acceptance, might be found to be positively correlated with the percentage of positive words used. Future research could then focus more directly on manipulations or interventions specifically related to these relevant constructs.

Method

Participants

Participants were 116 (81 female, 31 male, 4 missing, 69.6% European-American/Caucasian, $M_{age} = 20.31$ years, $SD = 4.14$) undergraduates from the University of North Carolina at Chapel Hill who were enrolled in either introductory psychology or introductory social psychology courses. Participants received credit toward partial fulfillment of their class research requirement or extra credit.

Pre-Manipulation Measures

Acceptance of Complexity. The 10-item Acceptance of Complexity (AoC, $\alpha = .87$) scale developed in Study 1 was used to assess acceptance of complexity.

Individual Difference Measures. Tolerance of ambiguity was assessed using the 13-item Multiple Stimulus Types Ambiguity Tolerance Scale (MSTAT-II, $\alpha = .84$; e.g., *"I am tolerant of ambiguous situations"*; McLain, 2009). This measure assesses overall tolerance of situations and stimuli that are unfamiliar, complex, or uncertain. Acceptance was assessed using the 7-item Acceptance and Action Questionnaire (AAQ-II, $\alpha = .85$; *"I worry about not being able to control my worries and feelings* <reverse-scored>*"*; Bond et al., 2011). AoC is hypothesized to be positively correlated with both the MSTAT-II and AAQ-II.

Affect. An affect grid was used to quickly assess participants' overall baseline emotional state. The affect grid (Russell, Weiss, & Mendelsohn, 1989) consists of a nine-by-

nine matrix differentiated by dimensions of valence and arousal with higher scores indicating

more positive valence and more arousal. A second affect grid was also used later on in the

experiment to quickly assess global affect immediately after participants wrote about an

important problem in their lives (task discussed below). In Study 1, AoC was found to be

positively correlated with satisfaction with life. Similarly, AoC is hypothesized to be

positively correlated with baseline affective valence (i.e., higher AoC, higher baseline

positive affect). Also, AoC is expected to be positively correlated with affective valence after

the writing task (i.e., those higher in AoC experience less negative or more positive affect as

a result of the task).

Manipulation

        Task. Acceptance of complexity was manipulated using a short task asking

participants to focus on either accepting complexity or accepting simplicity in the world.

Participants in the "complexity" condition read the following instructions before watching a

short video:

> For the remainder of the study we'd like you to think about the complexity of
> the world. Although the world can sometimes appear to be quite simple, most
> things in the world involve issues that seemingly have no easy or clear cut
> solution and can often be hard to understand or fully explain. For example,
> although we typically can quickly and easily categorize an individual as being
> simply either an introvert or an extrovert, people may actually fall somewhere
> along a complicated, fluctuating continuum from introverts to extroverts.
>
> People may have different reactions to the complexity of the world. For
> example, people may sometimes think that complexity is overwhelming or
> difficult, but at other times, people may accept and appreciate complexity.
>
> For today's study, we would like you to focus on taking an accepting attitude
> toward complexity.
>
> As a practice task in accepting the complexity of the world, please watch the
> following short video. It depicts an image called a *fractal*. "A fractal is a
> rough or fragmented geometric shape that can be subdivided in parts, each of
> which is (at least approximately) a smaller copy of the whole. Fractals are

generally self-similar (bits look like the whole) and independent of scale (they look similar, no matter how close you zoom in)("Fractal," 2011)." As you're watching the video, think about the complexity of the image and how it relates to your own life and the rest of the world.

Participants then completed a short three minute writing exercise with the following

instructions:

> Please take a few minutes and write about how you can accept the complexity of the world.

Participants in the "simplicity" condition read the following instructions before

watching a short video:

> For the remainder of the study we'd like you to think about the simplicity of the world. Although the world can sometimes appear to be quite complex, most things in the world can be broken down and thought about in a very simple way. For example, although people may actually fall somewhere along a complicated, fluctuating continuum from introverts to extroverts, we typically can quickly and easily categorize an individual as being simply either an introvert *or* an extrovert.

> People may have different reactions to the simplicity of the world. For example, people may sometimes think that simplicity is overwhelming or difficult, but at other times, people may accept and appreciate simplicity.

> For today's study, we would like you to focus on taking an accepting attitude toward simplicity.

> As a practice task in accepting the simplicity of the world, please watch the following short video. It depicts an image called a *fractal*. "A fractal is a rough or fragmented geometric shape that can be subdivided in parts, each of which is (at least approximately) a smaller copy of the whole. Fractals are generally self-similar (bits look like the whole) and independent of scale (they look similar, no matter how close you zoom in) ("Fractal," 2011)." As you're watching the video, think about the simplicity of the image and how it relates to your own life and the rest of the world.

Participants then completed a short three minute writing exercise with the following

instructions:

> Please take a few minutes and write about how you can accept the simplicity of the world.

Reinforcement Questions. Participants were asked the following questions before completing the three minute writing exercise following the short video (Instructions: *Please verify that you understand the instructions*): *"True or False: You are instructed to write about accepting complexity in the world."; "True or False: You are instructed to write about accepting simplicity in the world."* Participants who answered incorrectly were redirected to the task instructions and given the reinforcement questions again.

Comprehension Checks. Participants were asked the following questions as comprehension checks: *"What were you told to do in the previous task that you just completed?" <Write about accepting complexity in your life; Write about accepting simplicity in your life; Write about rejecting complexity in your life; Write about rejecting simplicity in your life; Write about fractals; Don't remember>; "True or False: You wrote about accepting complexity in your life."; "True or False: You wrote about accepting simplicity in your life.".*

Manipulation Reinstatement. The effects of the manipulations may be fleeting, so in order to maximize the effect on important dependent measures assessed later on in the experiment, there was a quick manipulation reinstatement included in the instructions for the positive meaning measure (described below). The reinstatement simply reminded participants of the manipulation task that they completed:

> … keeping in mind the video you watched earlier and your goal of focusing on accepting complexity/simplicity in the world and your life.

Positive Meaning Measure

One important measure of resilience and psychological well-being is how much an individual finds positive meaning in both negative as well as commonplace situations (Affleck & Tennen, 1996; Folkman, 1997). Finding positive meaning, especially in negative

events, buffers individuals from experiencing overwhelming negative emotions and allows them to move on with their lives. The positive meaning measure (Tugade & Fredrickson, 2004) has been used to assess this construct and acts as a state-level proxy for resilience. In this task participants identify and describe the most important personal problem in their lives. In order to make sure that the manipulation did not affect participants' choice of problem, they identified their problem earlier in the study before the manipulation. They were simply told to identify the most important personal problem that they are currently facing in their life. After the manipulation, participants were presented with the problem that they had identified earlier, and they read the following instructions:

> Next, we would like you to spend a few minutes writing about an important issue in your life, keeping in mind the video you watched earlier and your goal of focusing on accepting complexity/simplicity in the world and your life. Above is the most important personal problem that you are currently facing in your life, which you identified earlier. Please take about 8 minutes to write about this problem. Write about the experience in as much detail as you can. Really get into it and freely express any and all emotions or thoughts that you have about the experience. As you write, do not worry about punctuation or grammar; just really let go and write as much as you can about the experience.

After writing about their important personal problem, participants answered the following questions in reference to their problem (Instructions: *We'd like you to answer a few questions in reference to your personal problem*): *"Compared to other problems you've faced in your life, how serious is this problem?" <1 – Not serious at all; 7 – Most serious problem of my life>, "How much is this problem affecting you emotionally?" <1 – Not at all; 7 – Extremely>, "Which of the following categories best describes the domain of your problem?" <Relationship, Family, Friends, Academics, Work, Other (Please Specify)>.*

The positive meaning index (PMI, $\alpha = .68$), used in all reported analyses, is the sum of the standardized ratings on the following six questions (first four questions originally

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taken from Moos's, 1988, Coping Responses Inventory; Instructions: *People have many ways of responding to challenging situations. We are interested in how much you have done the following things with regard to this situation.*): *"Have you reminded yourself how much worse things could be?"; "Have you thought about how you are much better off than other people with similar problems?"; "Have you thought about how this event could change your life in a positive way?";* and *"Can you envision anything good coming out of dealing with this problem?"*. Participants responded using this scale: *No, Yes (once or twice), Yes (sometimes), Yes (fairly often), Not applicable*. Additionally, participants responded to the following two questions from *1 (Not at all)* to *7 (Extremely)*: *"To what extent do you feel that you might find benefit in this situation in the long-term?"* and *"How likely is it that there is something to learn from the experience?"*. Responses of "*not applicable*" were treated as missing data. For this study, higher scores on the positive meaning index represent greater state-levels of resilience in thinking about and dealing with participants' current problems.

Additional Measures

       Specific Emotions Measure. A modified version of the differential emotions scale (mDES; Fredrickson, Tugade, Waugh, & Larkin, 2003) was used to assess 25 specific emotions felt during or as a result of the manipulation (Instructions: *Please take a moment to recall your thoughts and feelings while you were writing about your personal problem, and then answer the following questions. To what extent did you experience any of the following feelings as a result of (or during) the writing task, if at all? If you felt none of the particular emotions, simply indicate zero. If you felt some of those emotions, indicate the degree by choosing a number from 1-4.*). Participants respond using this scale: *0 (Not at all); 1 (A little bit); 2 (Somewhat); 3 (Moderately); 4 (Extremely).* A *positive emotionality* variable was

computed by averaging standardized scores of general pleasantness (from the affect grid) and specific positive emotions from the mDES (this variable is further described in the Results section below).

Rumination Questionnaire. An 11-item modified version of the Rumination-Reflection Questionnaire (Trapnell & Campbell, 1999) was used to assess the extent participants ruminate about their current personal problem that they wrote about (mRRQ, α = .91; Appendix B). Some of the statements included: *"I tend to 'ruminate' or dwell over this problem for a really long time"; "I often find myself re-evaluating this problem"; "I spend a great deal of time thinking back over this problem";* and *"It is easy for me to put unwanted thoughts about this problem out of my mind* <reverse-scored>*"*. Participants responded on a scale from *1 (Strongly Disagree)* to *5 (Strongly Agree)*.

Individual Difference Measures. The same 14-item ER-89 (α = .79) used in Study 1 was used to assess ego-resiliency. This scale was included for two reasons. First, replication of the correlation between ego-resiliency and acceptance of complexity would be further evidence for the validation of the acceptance of complexity scale. Second, the relationship between ego-resiliency and positive meaning finding will be assessed. Analyses will attempt to replicate Tugade and Fredrickson's (2004) finding that positive emotionality mediates this relationship.

Finally, the 12-item short form of the Intolerance of Uncertainty scale (IUS-12, α = .88; Carleton, Norton, & Asmundson, 2007) was used to assess intolerance of uncertainty. The IUS-12 has two subscales: Prospective Anxiety (α = .82; e.g., *"Unforeseen events upset me greatly"*) and Inhibitory Anxiety (α = .89; e.g., *"Uncertainty keeps me from living a full*

life"). As was found in Study 1 with the longer scale measuring intolerance of uncertainty, IUS-12 and its two subscales are expected to be negatively correlated with the AoC scale.

Procedure

All data were collected using the online Qualtrics research suite. Participants first completed an informed consent form. Then they completed a baseline affect grid, the AoC scale, MSTAT-II, and AAQ-II. As part of the positive meaning measure, which they completed later in the experiment, participants identified their most important personal problem that they were currently facing. They were then randomly assigned to either the acceptance of *complexity* or *simplicity* condition, after which they watched the short video and completed the three minute writing task as well as the reinforcement and comprehension check questions. After the manipulation, participants were presented with their previously identified personal problem, and they wrote about their problem before completing a second affect grid followed by the positive meaning measure. Finally, participants completed the mDES, mRRQ, ER-89, IUS-12, and demographic questions. After completion of the experiment, participants viewed an online debriefing form and were given the number of the university counseling service in case they needed it.

CHAPTER 6

STUDY 2 RESULTS

Reinforcement and Comprehension Check Questions

Twenty-two participants (19.1%) failed the initial reinforcement questions.[4] A further 11 participants (9.6%) failed the reinforcement questions twice in a row. None of these participants were excluded from the analyses, however, because the purpose of the reinforcement questions was to maximize the likelihood that participants would read the manipulation instructions, not to exclude participants. Seven participants (6.2%) subsequently failed the comprehension check questions after the manipulation task and were initially excluded from all analyses.[5] Exclusion of these participants did not affect any of the analyses, thus all reported analyses include the full sample of 116 participants.

Characteristics of Current Problem

The highest percentage of participants identified *Academics* (31%) as the domain of their current problem followed by *Relationships* (19.5%), *Friends* (14.2%), *Family* (10.6%), and *Work* (10.6%), with the remaining participants indicating *Other* (14.2%) as the domain.[6]

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[4] "Failed" was defined by incorrectly answering either of the two reinforcement questions.

[5] "Failed" was defined by incorrectly answering any of the three comprehension check questions.

[6] Data for three participants were missing.

Domain of current problem did not differ by gender, $\chi^2(5, N = 112) = 2.67$, $p = .17$.[7] Participants reported that their current problem was quite serious compared to other problems that they had faced in their lives ($M = 4.85$, $SD = 1.43$). There was no effect of condition, $F(1, 111) = 0.13$, $p > .72$, or gender, $F(1, 110) = 0.20$, $p > .65$, on problem seriousness ratings. Participants also reported that their current problem was greatly affecting them emotionally ($M = 4.86$, $SD = 1.44$). There was no effect of condition, $F(1, 110) = 0.01$, $p > .92$, but there was an effect of gender, $F(1, 109) = 7.22$, $p < .01$, such that females ($M = 5.07$) were more emotionally affected than males ($M = 4.27$).

<center>Computing Global Affect and Composite Emotion Variables</center>

Acceptance of complexity (AoC) was positively correlated with satisfaction with life in Study 1, suggesting that AoC was particularly related to overall measures of positive psychological well-being. It was hypothesized that AoC would be similarly related to general experiences of affective valence (e.g., global affect).

Global affect was assessed using the Affect Grid at two times: baseline and immediately after participants wrote about their important problem. Each affect grid consists of two dimensions: pleasantness and arousal (higher scores indicate more pleasant feelings and higher arousal, respectively). Specific emotions were assessed using the mDES after participants completed the positive meaning measure. Participants reported the amount of each of 25 different emotions felt during or as a result of writing about their important problem. There are multiple methods for computing composites of emotions based on measures like the mDES, but I followed a similar method as Tugade and Fredrickson (2004)

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[7] Participants identified their current problem before the manipulation; therefore no analysis was conducted looking at the difference between the two conditions.

because one of the main goals of Study 2 was to replicate their finding that positive

emotionality mediates the relationship between ego-resiliency and positive meaning finding.

Tugade and Fredrickson (Study 3; 2004) created a measure of *positive emotionality,*

which consisted of a composite of the standardized scores of their positive mood measure

(sum of 19 positive affective terms) and four specific self-reported emotions that were

significantly positively correlated with ego-resiliency (eagerness, excitement, happiness, and

interested).[8] Following this method, a conceptual composite of this positive emotionality

measure (*PEt&f2004*, $\alpha = .72$) was computed using the standardized scores of participants'

second affect grid (pleasantness dimension) and self-reported excitement, happiness, and

interest.[9] A second positive emotionality composite (*PEm2012*, $\alpha = .83$) was also computed

using the standardized scores of participants' second affect grid (pleasantness dimension) and

the self-reported specific emotions that were significantly (excitement, content; $p < .02$) or

marginally (hopeful, happiness; $p < .06$) correlated with ego-resiliency in this particular

study, which is consistent with Tugade and Fredrickson's (2004) original selection method.[10]

Additionally, a general positive emotion measure (*PE10*, $\alpha = .90$) was computed by

averaging together the 10 positive emotion items included in the mDES (amused, awe,

excitement, grateful, hopeful, inspired, happiness, love, proud, and content). A negative

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[8] Tugade and Fredrickson ended up excluding *interested* from their positive emotionality variable because it was found to be a related factor of ego-resiliency. All analyses in Study 2 were conducted both including and excluding *interested* in the positive emotionality variable, and no differences were found, thus *interested* was included in all reported analyses in order to remain consistent with the original criteria for selecting each included variable (i.e., any specific positive emotion item that was significantly correlated with ego-resiliency).

[9] This is a conceptual composite because the exact same measures used by Tugade and Fredrickson (2004) were not included in this study. Instead, the pleasantness dimension of the second affect grid was substituted for their positive mood measure and three emotion items (labeled "excited, eager, enthusiastic", "joyful, glad, happy", and "interested, alert, curious") were substituted for their specific emotion items.

[10] *Interested* was also included in order to stay consistent with the previous measures although it was not marginally correlated with ego-resiliency ($r = .12$, $p = .21$). All analyses were again conducted both including and excluding *interested*, and no differences were found.

emotion measure (*NE12*, α = .84) was computed by averaging together the 12 negative

emotion items included in the mDES (angry, ashamed, bored, scorned, disgust, embarrassed,

guilty, hatred, rejected, sad, scared, and stressed).

Testing Effects of Manipulation

The manipulation did not significantly affect the amount of positive meaning found

after the writing task, $F(1, 111) = 0.03$, $p = .86$, the amount of reported rumination about the

problem, $F(1, 110) = 0.60$, $p = .44$, positive emotionality (PEt&f2004), $F(1, 111) = 0.11$, $p =$

.74, positive emotionality (PEm2012), $F(1, 111) = 0.12$, $p = .73$, general positive emotions

felt during the writing task (PE10), $F(1, 110) = 0.46$, $p = .50$, negative emotions felt during

the writing task (NE12), $F(1, 110) = 0.05$, $p = .83$, pleasantness (measured by the Affect

Grid) immediately after the writing task, $F(1, 110) = 0.30$, $p = .59$, or arousal (measured by

the Affect Grid) immediately after the writing task, $F(1, 110) = 0.34$, $p = .56$. In short, the

manipulation (i.e., focusing on the acceptance of complexity vs. acceptance of simplicity) did

not affect any of the dependent variables.[11]

Additionally, the ER-89 and IUS-12 were administered after the manipulation, but

neither was affected by the manipulation (Fs < 0.94, ps $> .33$); thus these scales were

included in all subsequent analyses with the assumption that they measured trait-level

characteristics, which is how the scales are conceptualized and have been used in previous

research.

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[11] Additional analyses were conducted looking at effects across each domain of participants' problems (e.g., Academics vs. Relationships). No significant effects were found for the main dependent variables, although this lack of significance could be due to a lack of power to detect effects because ns < 20 for all individual cells in these analyses. The same analyses were conducted looking at the more *social* domains (Relationships, Family, and Friends; $n = 50$) compared to the more *non-social* domains (Academics and Work; $n = 47$). Once again no differences were found, and there were also no significant interactions between social/non-social domains and experimental condition.

Further Validation of Acceptance of Complexity Scale

Table 8 shows the means, standard deviations, and bivariate correlations amongst the variables of interest, including the acceptance of complexity scale. AoC was not significantly correlated with ego-resiliency ($r = .09$, $p = .38$), failing to replicate Study 1. AoC was significantly correlated ($p < .05$) with the other validation measures: AAQ-II ($r = .28$), MSTAT-II ($r = .29$), and IUS-12 ($r = -.28$). Additionally, AoC was significantly correlated ($p < .05$) with baseline pleasantness ($r = .21$), pleasantness immediately after the writing task ($r = .26$), and negative emotions felt during the writing task ($r = -.24$).

One of the main goals of this study was to further explore the properties of the AoC scale in relation to other relevant scales such as the AAQ-II, MSTAT-II, and IUS-12 (as was done in Study 1 as well). For example, I had posited that AoC would predict resiliency over and above the effect of general acceptance (measured by the AAQ-II). However, the AoC scale and the AAQ-II were not correlated with either ego-resiliency or positive meaning finding (rs $< .14$, ps $> .17$); thus no further analysis was necessary to test this hypothesis.

Nevertheless, the AoC scale and the AAQ-II were both significantly correlated with multiple other related measures. A standardized residual of AoC was computed for each participant partialing out the effect of the AAQ-II. This standardized residual was significantly correlated ($p < .05$) with the MSTAT-II ($r = .21$), the Prospective Anxiety Subscale of the IUS-12 ($r = -.21$), baseline pleasantness ($r = .19$), and pleasantness immediately after the writing task ($r = .21$), suggesting that the AAQ-II cannot fully account for the relationship between AoC and these measures.

Similar variables were also computed partialing out the effects of the IUS-12 and MSTAT-II, respectively. After partialing out the effect of the IUS-12, the AoC residual was

correlated with baseline pleasantness ($r = .18$, $p < .06$) and pleasantness immediately after the writing task ($r = .23$, $p < .02$). After partialing out the effect of the MSTAT-II, the AoC residual was significantly correlated ($p < .05$) with the AAQ-II ($r = .20$), the Prospective Anxiety Subscale of the IUS-12 ($r = .-.20$), baseline pleasantness ($r = .20$), and pleasantness immediately after the writing task ($r = .26$).

<div align="center">Correlates of Positive Meaning Finding</div>

Positive meaning finding, measured by the positive meaning index[12] (PMI), was not correlated with many of the other scales included in the study. In fact, ego-resiliency was the only significant predictor ($r = .24$, $p < .02$), although ambiguity tolerance did marginally predict PMI ($r = .18$, $p = .06$). Consistent with past research, positive meaning finding was significantly correlated ($p < .05$) with positive emotionality (both PEt&f2004 and PEm2012).

<div align="center">Mediational Analyses (Attempted Replication of Tugade & Fredrickson, 2004)</div>

Another main goal of this study was to identify further characteristics of and important variables related to positive meaning finding. Specifically, past research (Tugade & Fredrickson, 2004) found that ego-resiliency was positively correlated with positive meaning finding, and this relationship was mediated by positive emotionality. The following analyses attempt to replicate this previous finding and then take it further by identifying another variable that may help explain more about the properties of this measure.

I tested mediation within models using Preacher and Hayes's (2008) method of calculating standard errors and 95% confidence intervals. This method uses 5,000 bootstrapped samples to estimate the indirect effect in each resampled dataset, allowing for the construction of confidence intervals for the bias corrected effect. Results indicated that positive emotions/positive emotionality did not mediate the relationship between ego-

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[12] There was no effect of gender on PMI, $F(1, 110) = 0.05$, $p > .82$.

resiliency and positive meaning finding, regardless of whether it was measured by PE10

(Mediated Effect = .0025, *SE* = .0033, 95% *CI*: Lower = -.0035, Upper = .0098), PEt&f2004

(Mediated Effect = .0027, *SE* = .0042, 95% *CI*: Lower = -.0056, Upper = .0114), or

PEm2012 (Mediated Effect = .0043, *SE* = .0044, 95% *CI*: Lower = -.0036, Upper = .0134). I

concluded that there was not a significant mediational effect because the confidence intervals

contain zero and the relationship between ego-resiliency and positive meaning finding

remained significant when each tested variable was included in the model, thus failing to

replicate Tugade and Fredrickson's (2004) finding.

Ambiguity tolerance (MSTAT-II) was the only other marginal predictor of both ego-

resiliency (*r* = .22, *p* = .02) and positive meaning finding (*r* = .18, *p* = .06). However, it also

did not individually mediate the relationship between ego-resiliency and positive meaning

finding (Mediated Effect = .0041, *SE* = .0030, 95% *CI*: Lower = -.0002, Upper = .0113).

Nevertheless, both positive emotionality, especially indexed by PEm2012, and

ambiguity tolerance did reduce the relationship between the two variables of interest and the

analyses were close to being significant. Thus another analysis was conducted, this time

including both positive emotionality (PEm2012) and ambiguity tolerance as simultaneous

mediators (see Figure 2).

Although positive emotionality and ambiguity tolerance as a set do not significantly

mediate the relationship between ego-resiliency and positive meaning finding (Total

Mediated Effect = .0081, *SE* = .0051, 95% *CI*: Lower = -.0012, Upper = .0189)[13], including

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[13] The specific indirect effect of positive emotionality (Mediated Effect = .0041, *SE* = .0043, 95% *CI*: Lower = -.0040, Upper = .0131) did include zero (suggesting it was not a significant mediator), but the specific indirect effect of ambiguity tolerance (Mediated Effect = .0040, *SE* = .0030, 95% *CI*: Lower = .0000, Upper = .0123) had zero as its lower bound, suggesting that ambiguity tolerance was close to being a significant mediator, and thus it is accounting for more of the overall relationship between ego-resiliency and positive meaning finding compared to positive emotionality.

both in the model does bring the direct effect of ego-resiliency on positive meaning finding to nonsignificance ($b = .02$, $p > .09$), suggesting that the these two variables are accounting for a portion of the overall relationship.

Further evidence also suggests that positive emotionality and ambiguity tolerance account for most of the relationship between ego-resilience and finding positive meaning in current difficult problems. A standardized residual of ego-resiliency was computed for each participant partialing out the shared variance with both positive emotionality and ambiguity tolerance. This standardized residual was not significantly correlated with the positive meaning index ($r = .155$, $p = .11$). Thus, Tugade and Fredrickson's (2004) previous finding that individuals' levels of positive emotionality accounts for the relationship between ego-resiliency and positive meaning finding may be qualified by the degree to which they tolerate ambiguity.[14]

<center>Linguistic Characteristics of Writing about Current Problem</center>

In addition to the general characteristics of participants' current problems reported above, it is also potentially useful to further probe participants' actual writing during the main task. Identifying linguistic characteristics, such as word count and percentage of positive words used, could reveal important aspects of the writing task which can be used to develop more targeted manipulations and interventions for future research. Therefore, exploratory analyses were conducted on all participants' writing samples using the LIWC2007 program (Pennebaker, Booth, & Francis, 2007). This linguistic inquiry and word count (LIWC) program analyzes the linguistic makeup of text, identifying various linguistic

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[14] In fact, ambiguity tolerance moderates the relationship amongst ego-resiliency, positive emotionality, and positive meaning finding. Specifically, for those low in ambiguity tolerance (below the mean), ego-resiliency is strongly correlated with positive meaning finding ($r = .33$, $p < .02$) while positive emotionality is not ($r = .18$, $p = .18$), but for those high in ambiguity tolerance (above the mean), positive emotionality is strongly correlated with positive meaning finding ($r = .32$, $p < .02$) while ego-resiliency is not ($r = .08$, $p = .56$).

processes (e.g., word count, past tense, future tense), psychological processes (e.g., positive emotion, cognitive processes), and personal concerns (e.g., work, money). There was no effect of condition, $F(1, 110) = 0.02$, $p > .90$, on the length of narratives[15], but there was an effect of gender, $F(1, 109) = 5.89$, $p < .05$, such that females ($M = 304.29$) wrote more than males ($M = 215.45$). Table 7 reports the means and standard deviations of each relevant LIWC dimension.

In exploratory analyses considering correlations between individual LIWC dimensions and the relevant individual difference measures, AoC was found to be marginally correlated with length of writing ($r = .17$, $p = . 08$) and significantly correlated with the LIWC cognitive processes dimension *insight* ($r = .29$, $p < . 01$), which includes words such as *think, know,* and *consider*.[16] Positive meaning finding was significantly negatively correlated ($p < .05$) with the LIWC dimensions of *anger* words ($r = -.20$) and *inhibition* ($r = -.20$), which includes words such as *block, constrain,* and *stop*. It was not correlated with other related LIWC dimensions, such as *anxiety* or *sadness* words, or the negative emotion composite (NE12), so it is difficult to make much out of the correlation with *anger* words without additional research.

Overall, the modified rumination and reflection questionnaire (mRRQ) was correlated with the most individual dimensions, suggesting that rumination is the most directly related construct to participants' writing during the task. Table 8 shows the marginal and significant bivariate correlations between the mRRQ and LIWC dimensions.

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[15] There was also no effect of condition on any of the other LIWC dimensions, Fs < 1.77, ps $> .18$.

[16] Further exploratory analysis found that use of *insight* words partially accounted for the relationship between Acceptance of Complexity and baseline pleasantness, Mediated Effect = .0852, SE = .0616, 95% CI: Lower = -.0068, Upper = .2285). This suggests that the strong correlation between acceptance of complexity and global affect can be partially explained through more of a cognitive (as opposed to affective) mechanism.

CHAPTER 7

STUDY 2 DISCUSSION

Effects of the Manipulation

There were no significant differences between conditions (instructed to focus on the acceptance of complexity versus focusing on the acceptance of simplicity) on any of the relevant measures. There are four main possibilities for this lack of differences. First, the null hypothesis could be true. That is, manipulating acceptance of complexity does not influence finding positive meaning or rumination. This explanation is certainly possible, especially considering the nonsignificant correlations between acceptance of complexity and these measures.

Second, it could be that the manipulation simply failed or that it was not strong enough to produce any measureable differences between groups. One of the main goals of the study was to test a very quick manipulation with the hopes of achieving important gains in psychological well-being and resilience without the time commitment and energy investment of related interventions (e.g., ACT, MBCT). It is quite possible that this manipulation was too short and simple, and that future attempts focusing on longer or more involved interventions could be fruitful and provide the types of psychological gains that were expected.

Third, it is also possible that the manipulation did, in fact, work, meaning that the manipulation tasks actually affected participants and their subsequent responses on the relevant measures, but that both tasks affected participants in the same way. All participants were instructed to focus on acceptance; the true independent variable here was if they did this toward complexity or simplicity. Due to the lack of a control group not instructed to focus on acceptance, it is possible that the general practice of focusing on acceptance actually did produce the expected salubrious effects on the important dependent variables, such as positive meaning finding. Further research must overcome this methodological limitation by including better control groups.

Finally, the main post-manipulation dependent variables (positive meaning finding and rumination) might have been too focused on past thoughts and behaviors as opposed to the potential good that could have been gained by completing the writing task with a focus on accepting complexity. For example, participants might have interpreted the question *"Can you envision anything good coming out of dealing with this problem?"* and the statement *"I spend a great deal of time thinking back over this problem"* as referring to their thoughts and ruminations *before* the writing task instead of construing the writing task as a way to *gain* positive meaning or *decrease* rumination in the future by focusing on the acceptance of complexity. Future research could include more targeted questions that assess participants' thoughts about the problem as a result of the writing task, as opposed to their overall thoughts and ruminations that might have taken place beforehand. Also, task instructions could prompt participants to consider these same types of positive meaning and ruminations questions with a focus on the future as well as the acceptance of complexity. These changes could help better identify true changes caused by the manipulation.

Further Validation of Acceptance of Complexity Scale

Further properties of the acceptance of complexity scale were identified. Specifically, moderate positive correlations were found with acceptance (AAQ-II) and ambiguity tolerance (MSTAT-II), and a moderate negative correlation was found with intolerance of uncertainty (IUS-12). AoC was also found to be positively related to baseline affect and affect immediately after writing about a difficult problem. Further analysis found that these correlations with affect remained after individually controlling for the effects of general acceptance, ambiguity tolerance, and intolerance of uncertainty. Additionally, separate analyses found that these three related constructs could not individually account for all of the correlations between AoC and other measures (e.g., AoC still predicted the MSTAT-II and prospective anxiety subscale of the IUS-12 after controlling for the effects of the AAQ-II, AoC still predicted the AAQ-II and prospective anxiety subscale of the IUS-12 after controlling for the effects of the MSTAT-II, etc.).

These analyses suggest that AoC is measuring a different construct than the AAQ-II, MSTAT-II, and IUS-12. Moreover, the most informative piece of evidence is possibly the consistent correlation between AoC and affect (both baseline and after the writing task), even after controlling for the other measures. This finding is consistent with Study 1, which found that AoC significantly predicted satisfaction with life even after partialing out the effect of intolerance of uncertainty. It appears to be that acceptance of complexity is most closely tied (compared to the other related constructs) to general levels of affect and satisfaction. This is important for future research because it may be worthwhile to focus more on increasing acceptance of complexity if the ultimate goal is to increase affect and overall satisfaction. Conversely, if the ultimate goal is to increase resiliency, it may be worthwhile to focus more

on other constructs instead (e.g., increasing ambiguity tolerance or decreasing intolerance of uncertainty).

Analysis also revealed a failure to replicate the significant correlation between AoC and ego-resiliency found in Study 1, although the correlation was in the predicted direction. This lack of replication may speak to a larger property of the AoC scale. Instead of measuring the type of resiliency that ego-resiliency is conceptualized to do (i.e., an individual's ability to positively adapt and adjust to ever-changing situations in order to maintain personal stability and equilibrium), the AoC scale may be getting more at an aspect of resiliency best captured by the challenge subscale of the dispositional resilience scale. The challenge subscale reflects how much an individual construes changes and challenges as opportunities to learn and explore as opposed to threats to one's safety or the status quo. AoC was more strongly correlated with this aspect of resilience (in Study 1) than any of the other subscales of dispositional resilience or ego-resiliency. The main difference between the challenge subscale and other aspects of resiliency has to do with a more cognitively-based view of the world that involves interpreting situations, especially difficult ones, in a positive way. Due to a concern of overloading participants with too many measures, the dispositional resilience scale was not included in Study 2. However, future research involving the AoC, particularly ones concerned about increasing AoC, should include a greater focus on the challenge subscale of dispositional resilience.

Properties of Positive Meaning Finding

Consistent with past research, positive meaning finding was most related to ego-resiliency and positive emotionality. Although I was unable to directly replicate Tugade and Fredrickson's (2004) finding that positive emotionality mediates the relationship between

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ego-resiliency and positive meaning finding, I did identify ambiguity tolerance (along with a similar measure of positive emotionality) as another important measure that can help account for this relationship. It seems worthwhile to focus future attempts at manipulations or interventions meant to increase overall resiliency on not only those processes related to increasing the experience of positive emotions but also those on increasing tolerance of ambiguous situations. Manipulations and interventions with this dual focus should produce the largest effect on positive meaning finding, and, hopefully, on other forms of state-level resilience.

<div align="center">Characteristics of Participants' Responses to Writing Task</div>

A final goal of Study 2 was to explore more about the characteristics of participants' responses to the writing task that was the basis for the measure of state-level resilience (positive meaning finding). More information about the task may help to inform future research on how best to design manipulations and interventions meant to directly affect individuals' responses and thoughts about this task.

First, there were differences based on gender. Specifically, females were more emotionally affected by the problems they wrote about and they also wrote more overall (i.e., greater word count). Thus this task may be more engaging for females than for males, though this was not directly measured in the current study.

Analysis using the LIWC program revealed that participants used more positive emotion words compared to negative emotion words, although the ratio was not close to the optimal 3:1 ratio found by Fredrickson and Losada (2005) to be important for human flourishing. This finding is not that surprising, however, because the participants' task was to write about the most difficult problem that they were currently facing.

Analyses involving the LIWC dimensions may be most useful in observing correlations between the individual dimensions and constructs of interest. The modified rumination and reflection questionnaire (mRRQ) was correlated with the most individual LIWC dimensions. Specifically, those higher in rumination wrote more, used more past tense, and expressed less positive emotion and more negative emotion (including anxiety, anger, and sadness). All of these findings are consistent with past research on rumination (e.g., Trapnell & Campbell, 1999). It is also pertinent to note that greater rumination was related to less general acceptance, positive emotionality, and positive affect and to more intolerance of uncertainty and negative emotions. These findings suggest that future research using this task might want to focus on decreasing rumination more directly. This could be done with more established interventions such as acceptance-based therapies and mindfulness training programs, both of which focus on curbing rumination.

CHAPTER 8

GENERAL DISCUSSION

The overall goal of this dissertation was to begin a program of research with the ultimate aim of developing a quicker and more efficient intervention meant to increase individual levels of a new construct, acceptance of complexity (AoC). In accordance with this goal, the first study developed a short scale measuring acceptance of complexity. A one-factor solution was suggested by the factor retention criteria, and the scale displayed excellent reliability across Study 1 ($\alpha = .83$) and Study 2 ($\alpha = .87$). The scale was partially validated by comparing it to multiple psychological well-being and resilience measures as well as conceptually-related constructs. As hypothesized, the scale was found to be correlated with indicators of positive psychological well-being such as satisfaction with life and resiliency, and it was found to be conceptually and empirically distinct from related constructs such as intolerance of uncertainty and need for closure.

The second study manipulated acceptance of complexity and tested its effects on state-level resilience. Unfortunately the manipulation did not produce any significant effects, but much was still learned about the construct of acceptance of complexity and the state-level resilience measure used as the main dependent variable. Specifically, Study 2 helped further differentiate the acceptance of complexity scale from the related constructs of intolerance of uncertainty, acceptance, and ambiguity tolerance, leading to the conclusion that acceptance

of complexity is most uniquely predictive of the experience of overall positive affect (and overall satisfaction with life), compared to other important psychological well-being and resilience measures.

This study also identified ambiguity tolerance as an additional potential mediator that explains the relationship between ego-resiliency and finding positive meaning in difficult events (in addition to the research that had previously identified positive emotionality as a mediator of this relationship; see Tugade & Fredrickson, 2004). This finding will help inform future research that seeks to manipulate constructs related to positive meaning finding. Finally, Study 2 began to reveal more about the overall writing task (recounting the most difficult current problem) that is the basis for the positive meaning finding measure. Textual analysis was used to bring a new level of specificity and understanding to what participants write about. One specific finding from this analysis illuminated the importance of rumination in relation to what participants wrote. Future research could focus more directly on manipulating or attempting to curb rumination when participants complete this task.

<center>The Acceptance of Complexity</center>

Acceptance of complexity is conceptualized as a willingness to experience complex situations without judgment or avoidance. It involves being aware of the complexity in the world and in one's life without becoming overwhelmed by it. The acceptance of complexity scale was developed to measure this new construct using items such as *"It doesn't irritate me that there are some things in the world that will never be fully explained," "I am at peace with the complexity of the world,"* and *"Complexity in the world doesn't bother me."* As hypothesized, the scale predicted important indicators of psychological well-being such as

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higher satisfaction with life, positive affect, and aspects of resiliency (e.g., challenge subscale of dispositional resilience) and lower anxiety and depression symptoms.

Additionally, it shares conceptual and empirical links to intolerance of uncertainty, ambiguity tolerance, acceptance, and need for closure. Further analyses explored deeper connections between acceptance of complexity and these related constructs. Specifically, acceptance of complexity uniquely predicted satisfaction with life, general (baseline) affective valence, and affective valence after writing about a difficult problem, above and beyond the individual effects of the related constructs.

Conflicting evidence was found for the relationship between AoC and ego-resiliency. Study 1 found a significant positive correlation between the two variables while Study 2 did not, although the correlation was in the predicted direction. These results may illuminate a more general property of the AoC scale. Specifically, although AoC was hypothesized to be positively related to an individual's ability to positively adapt to ever-changing situations (ego-resiliency), it might be more related or indicative of the construct measured by the challenge subscale of the dispositional resilience scale. The challenge subscale measures how much an individual construes changes and challenges as opportunities to learn and explore versus as threats to one's safety or the status quo (Bartone et al., 1989). These results are consistent with the more cognitively-based conceptualization of acceptance of complexity as being about construing the world, especially difficult or complex situations, in positive (or at least *non-negative*) ways.[17] Future research that successfully increases AoC might be useful for also increasing individuals' construal of challenging situations, possibly causing them to approach these situations instead of avoid them.

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[17] This interpretation is further supported by the exploratory analysis showing that use of cognitive *insight* words partially accounted for the relationship between AoC and baseline pleasantness in Study 2.

Overall, the acceptance of complexity scale appears to measure what it has been hypothesized to measure, and it can be used in future research concerning psychological well-being and resilience. It is one of the first measures of its kind to focus much more explicitly on positive aspects of psychological well-being (e.g., satisfaction with life and general levels of affect) as opposed to negative aspects (e.g., depression and anxiety). It may be especially useful to researchers looking for a construct (compared to related constructs such as intolerance of uncertainty, acceptance, and tolerance ambiguity) that best predicts overall satisfaction with life, general levels of affect, and "challenge" aspects of resiliency.

Effectiveness of Manipulation

One of the main goals of this dissertation was to explore a short and efficient manipulation or intervention meant to increase the acceptance of complexity in the hope that it would lead to similar salubrious effects as longer and more involving interventions used in other research (e.g., ACT-based interventions, MBCT, and LKM). In accordance with this goal, Study 2 attempted to manipulate acceptance of complexity by having participants directly focus on it (compared to focusing directly on the acceptance of simplicity). Unfortunately the manipulation did not show significant differences between conditions.

These null results may have occurred for one of four reasons. First, the null hypothesis could be true. Second, the manipulation may have failed or been too weak to produce any significant changes. Third, the manipulation could have been effective, but it caused similar changes for both those directed to focus on accepting complexity and those directed to focus on accepting simplicity. This possibility would be indicative of a larger "acceptance" effect, which cannot be detected because the lack of an appropriate control group not directed to focus on accepting something. Finally, the relevant post-manipulation

dependent variables (e.g., positive meaning finding and rumination) might have assessed participants' past behavior and thoughts (before the manipulation) instead of their behavior and thoughts as a result of the manipulation. These limitations, as well as possible recommendations to overcome them in future research, are discussed more below.

<center>Implications for Resiliency and Positive Meaning Finding</center>

Resiliency is a key aspect of psychological well-being, and it was hypothesized that acceptance of complexity would be positively related to it. Although the studies found mixed evidence for the correlation between acceptance of complexity and ego-resiliency, acceptance of complexity was found to be positively correlated with dispositional resilience, particularly the challenge subscale. Further research using different populations must be done to in order to fully understand the connection between acceptance of complexity and the different aspects of resiliency, but this research does suggest that accepting complexity is a key component of construing changes and challenges in a positive way.

Beyond exploring the connection between resiliency and acceptance of complexity, the current research also identified two other constructs (intolerance of uncertainty and ambiguity tolerance) that are predictive of resilience. Future research might focus more on manipulating these particular constructs (e.g., increasing ambiguity tolerance or decreasing intolerance of uncertainty) in order to ultimately increase resilience.

Study 2 also explored more about a construct often used as an indicator of or proxy for resiliency: finding positive meaning in negative or troubling events. It is important to further probe the variables and concepts most related to this measure because it can be easily used as an indicator for increases or decreases in short-term resilience, making it an excellent measure for this, as well as future, research that attempts to accomplish that goal. Tugade and

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Fredrickson (2004) had previously found that positive emotionality (a composite of overall positive mood and specific emotions significantly correlated with ego-resiliency such as excitement, enthusiastic, and joy) fully mediated the relationship between ego-resiliency and positive meaning finding. Study 2 failed to replicate this past finding, but it did identify ambiguity tolerance, in addition to positive emotionality, as an important variable that accounts for some of the relationship between these two key constructs.

Textual analysis also revealed important linguistic characteristics of the writing task that is used as the basis for the positive meaning finding measure. Specifically, rumination was identified as being related to many of the individual linguistic dimensions measured by the textual analysis program. Instead of focusing on manipulating acceptance of complexity, which was not found to be related to positive meaning finding, future research using the positive meaning finding measure might focus more directly on constructs identified here as being most related positive meaning finding (i.e., ambiguity tolerance, positive emotionality, and rumination).

Implications for Acceptance, Mindfulness, and Similar Interventions

Acceptance of complexity is clearly related to the broader concept of psychological acceptance (or simply acceptance). It is, at its core, a more specific and targeted form of acceptance, and acceptance of complexity can be thought of as the willingness to experience complexity without avoiding it or having it determine one's actions. Study 2 explored the relationship between acceptance of complexity and acceptance. It was hypothesized that acceptance of complexity would predict ego-resiliency and positive meaning finding over and above what acceptance predicted. Unfortunately, neither acceptance of complexity nor acceptance was significantly correlated with either of these two constructs in Study 2.

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However, acceptance of complexity and acceptance were both significantly correlated with other related measures. It was found that acceptance of complexity still predicted baseline affective valence, affective valence immediately after writing about a difficult problem, ambiguity tolerance, and prospective anxiety even after controlling for acceptance. These results suggest that more specific or targeted forms of acceptance (such as of complexity) can be useful in understanding how acceptance and acceptance-based therapies are related to and can be used for increasing positive psychological well-being.

Acceptance-based therapies, such as Acceptance and Commitment Therapy (ACT), have focused on increasing positive psychological well-being by targeting psychological flexibility, which can be defined the as the ability to remain in the present moment and engage in behaviors that lead to the accomplishment of valued goals (Hayes et al., 2007). A core concept related to psychological flexibility is mindfulness, defined as a nonjudgmental or open-minded approach of focusing on or being aware of the present moment (Kabat-Zinn, 2003; Baer, 2003). Mindfulness was not directly measured in this research, but acceptance of complexity is thought to also be positively correlated with it. Much research has recently focused on mindfulness interventions to increase positive psychological well-being, with positive results (e.g., Teasdale et al., 2000; Semple et al., 2010; Geschwind et al., 2011). Similarly, other meditation techniques (e.g., loving-kindness meditation) have successfully affected multiple indicators related to psychological well-being and resilience (Fredrickson et al., 2008).

One main downside to these effective interventions and techniques is the lengthy time and energy commitment involved. Manipulating acceptance of complexity was expected to achieve similar results as these other interventions, so another main goal of this research was

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to explore an easier and more efficient intervention. Unfortunately the manipulation of acceptance of complexity in Study 2 failed to yield significant differences between conditions. Future research must be done with better control groups and potentially longer and more involved acceptance of complexity manipulations in order to better achieve the goal of a shorter, less effortful intervention. Therefore, without further research, the established acceptance and meditation-based interventions remain the best avenue to increase psychological well-being.

It is also important to note that even if shorter, more efficient manipulations did produce the expected momentary changes (e.g., increased state-level resilience and positive emotions), this is not definitive evidence that these manipulations could replace longer, more involved interventions (e.g., ACT, MBCT). Positive short-term changes do not necessarily lead to salubrious long-term benefits. Future research, potentially using longitudinal methods, must explore the steps involved in turning momentary effects into lasting changes. For example, short three-minute manipulations, such as the one used in Study 2, may, in fact, lead to momentary changes in psychological resilience, but this effect may not lead to any long-lasting changes. Instead of a one-time manipulation, it may be necessary for one to do such tasks multiple times a week for a substantial period of time in order to obtain the long-term benefits.

CHAPTER 9

LIMITATIONS

Despite the fact that the current research illuminated many intriguing aspects of the new construct acceptance of complexity, there were a couple limitations, particularly regarding the attempted manipulation of acceptance of complexity in Study 2. No significant differences were found between the two experimental conditions (focusing on acceptance of complexity versus acceptance of simplicity), but it cannot be fully concluded that the manipulation failed for two main reasons. First, there was no distinct control group that was not instructed to focus on acceptance of some concept (such as complexity or simplicity). Therefore it is quite possible that the manipulation did, in fact, cause expected changes in positive meaning finding but that the effects occurred for both experimental conditions. This possibility would reflect a broad, undifferentiated effect of focusing on acceptance. Future research can rule out this possible explanation by including additional control groups not instructed to focus on acceptance.

Secondly, participants may not have construed the main dependent variables expected to be affected by the manipulation (positive meaning finding and rumination) in the way that they were originally intended to be. Specifically, these dependent variables were expected to measure positive meaning finding and rumination in the moment or expected in the future, although they may have been construed of as behaviors or thoughts that occurred in the past.

For example, participants may have been reporting the amount of positive meaning that they found *before* they participated in the study, as compared to as a result of the study. Similarly, reported rumination may have been for the overall amount of rumination about the problem up until that point, and not for the expected amount of rumination in the future. The manipulation was not expected to affect memory of positive meaning finding and rumination; instead it was expected to affect current or future positive meaning finding and rumination. Thus future research needs to include clearer measures that specify the time frame (e.g, presently or in the future) of positive meaning finding and rumination.

CHAPTER 10

FUTURE DIRECTIONS

The ultimate goal of this new program of research is to develop a shorter and more efficient intervention that increases psychological well-being and resilience. The acceptance of complexity appears to be a good construct to further pursue in order to accomplish this goal, but there are multiple aspects of the scale as well as additional attempts to manipulate acceptance of complexity that must be further explored. First, further validation of the acceptance of complexity scale is needed, especially using different populations and directly involving other important psychological well-being measures such as mindfulness. It is also important to consider the inclusion of more negatively worded items in the AoC scale to rule out the possibility that common method variance explains the scale's correlation with measures sharing similar method structure (e.g., satisfaction with life scale).

Secondly, manipulations of acceptance of complexity must be tested in experimental settings with appropriate control groups (i.e., not instructed to focus on acceptance) and with dependent variables that clearly measure current or future thoughts and behaviors ostensibly affected by the actual manipulation. The results of these types of experiments will allow researchers to be better able to conclude that shorter, more efficient interventions or manipulations, such as the one attempted in Study 2, are a fruitful area of research. It is also important to experimentally test short manipulations and interventions of acceptance or

mindfulness against the short manipulations of acceptance of complexity in order to determine if acceptance of complexity is the best avenue to explore out of these related constructs.

In may not be the case, however, that this type of very short intervention can lead to the same type of salubrious effects found by the longer and more involved interventions used in previous research (e.g., acceptance- and mindfulness-based therapies and interventions). Therefore, future research could also consider slightly longer interventions (e.g., one day workshops) meant to increase acceptance of complexity.

CHAPTER 11

CONCLUSION

The main goal of this dissertation was to begin a program of research centered on the new construct acceptance of complexity. The two studies reported here successfully began to illuminate the relationship between acceptance of complexity and multiple other important constructs (e.g., psychological well-being, resilience, intolerance of uncertainty, psychological acceptance). The 10-item acceptance of complexity scale developed in Study 1 appears to be a good measure of the construct, and it can be used by other researchers interested in looking at more targeted forms of psychological acceptance.

Although the effectiveness of the acceptance of complexity manipulation in Study 2 was inconclusive, manipulation of the construct still seems to be a useful avenue of research to pursue in the future. Even with this foundation, much further research must be done in order to not only better understand the acceptance of complexity but also to explore shorter and more efficient manipulations and interventions meant to increase acceptance of complexity and, subsequently, improve psychological well-being and resilience.

Table 1.

Predicted and actual correlations between the 10-item Acceptance of Complexity Scale and

Validation Measures in Study 1

	SWLS	ER-89	DR	LOT-R	PHQ-9	OASIS	IUS	NfCog	NfClo	CM10
Predicted Correlation	+	+ +	+ +	+	-	- -	- -	+	- -	0
Actual Correlation	*.24*	**.18**	*.25*	.13	*-.14*	**-.24**	**-.34**	.13	**-.23**	***.23***

Note. ++ = High Positive Correlation; + = Low Positive Correlation, 0 = No Correlation;
- = Low Negative Correlation; - - = High Negative Correlation.

Italics = $p < .08$ **Bold** = $p < .05$ ***Bold & Italics*** = $p < .01$

Table 2.

Means, Standard Deviations, and Item-Scale Correlations for 10-item Acceptance of

Complexity Scale in Study 1 (α = .83)

	Item Mean	*Standard Deviation*	*Item-Scale Correlation*
I am at peace with the complexity of the world.	4.35	1.05	.58
Sometimes things are imperfect, but I'm okay with that.	4.40	1.31	.54
I accept that the world is a complex place.	5.32	0.89	.41
It doesn't bother me that some things will never be perfect.	4.00	1.38	.58
I'm okay with situations that require analyzing multiple points of view.	5.13	0.943	.43
It doesn't irritate me that there are some things in the world that will never be fully explained.	3.80	1.47	.62
Complexity in the world doesn't bother me.	4.15	1.25	.59
I accept that some things in the world will never be fully explained.	4.68	1.28	.49
I acknowledge that some problems don't have a straightforward answer.	5.07	0.92	.41
I hate that the world will never be fully explained.[R]	3.97	1.33	.56

Note. N = 161.

[R] *Item is reverse-scored*

Table 3.

Factor Loadings from One-Factor Solution for the 10 items in the Acceptance of Complexity

Scale using Maximum Likelihood Extraction (Study 1)

	Factor Loading
I am at peace with the complexity of the world.	.68
Sometimes things are imperfect, but I'm okay with that.	.60
I accept that the world is a complex place.	.41
It doesn't bother me that some things will never be perfect.	.64
I'm okay with situations that require analyzing multiple points of view.	.43
It doesn't irritate me that there are some things in the world that will never be fully explained.	.65
Complexity in the world doesn't bother me.	.70
I accept that some things in the world will never be fully explained.	.50
I acknowledge that some problems don't have a straightforward answer.	.39
I hate that the world will never be fully explained.[R]	.60

Note. N = 161.

[R] *Item is reverse-scored*

Table 4.

Factor Loadings from Four-Factor Solution for the 10 items in the Acceptance of Complexity

Scale using Maximum Likelihood Extraction with Quartimin Rotation (Study 1)

	Factor 1	Factor 2	Factor 3	Factor 4
I am at peace with the complexity of the world. (Factor 1)	**.68**	.11	.04	.04
Sometimes things are imperfect, but I'm okay with that. (Factor 4)	-.01	.02	.00	**.84**
I accept that the world is a complex place. (Factor 2)	-.01	**.74**	.07	-.08
It doesn't bother me that some things will never be perfect. (Factor 4)	.14	-.03	.11	**.63**
I'm okay with situations that require analyzing multiple points of view. (Factor 2)	.15	**.57**	-.03	-.02
It doesn't irritate me that there are some things in the world that will never be fully explained. (Factor 3)	.10	-.12	**.92**	.03
Complexity in the world doesn't bother me. (Factor 1)	**1.01**	-.05	.00	.02
I accept that some things in the world will never be fully explained. (Factor 3)	-.01	.37	**.40**	-.02
I acknowledge that some problems don't have a straightforward answer. (Factor 2)	-.01	**.47**	-.04	.15
I hate that the world will never be fully explained.[R] (Factor 3)	-.01	.15	**.45**	.21

Note. Largest loadings bolded. Factor that each item has the highest loading on is in parentheses. $N = 161$.

[R] *Item is reverse-scored*

Table 5.

Means, Standard Deviations, and Bivariate Correlations among Variables in Study 1

	M (SD)	1	2	3	4	5	6	7	8
1. AoC	4.07 (0.68)	--							
2. SWLS	25.80 (6.20)	*.24*	--						
3. ER-89	41.23 (6.18)	**.18**	*.37*	--					
4. DR	86.83 (7.72)	*.25*	*.28*	*.53*	--				
5. DR Commit	30.91 (3.89)	.08	*.33*	*.30*	*.75*	--			
6. DR Control	29.53 (3.21)	.14	*.32*	*.37*	*.74*	*.50*	--		
7. DR Chall	26.48 (3.95)	*.27*	-.03	*.44*	*.61*	.07	*.15*	--	
8. LOT-R	20.82 (3.95)	.13	*.60*	*.31*	*.46*	*.48*	*.45*	.04	--
9. PHQ-9	14.96 (4.72)	*-.14*	**-.46**	**-.17**	**-.41**	**-.40**	**-.36**	-.12	**-.46**
10. OASIS	9.23 (3.12)	**-.24**	**-.35**	**-.25**	**-.39**	**-.32**	**-.31**	**-.19**	**-.40**
11. IUS	83.22 (25.24)	**-.34**	**-.24**	**-.31**	**-.48**	**-.23**	**-.22**	**-.54**	**-.38**
12. NfCognition	59.53 (11.59)	.13	.09	*.53*	*.40*	.13	*.23*	*.48*	.02
13. NfClosure	155.69 (19.64)	**-.23**	.11	**-.28**	**-.28**	.11	.01	**-.64**	.04
14. Pre f Order	42.01 (7.54)	**-.16**	*.15*	*-.16*	**-.17**	*.21*	.08	**-.58**	*.16*
15. Pre f Predic	28.87 (6.05)	**-.24**	-.09	**-.50**	**-.41**	-.08	-.08	**-.67**	**-.16**
16. Decisive	23.09 (6.36)	**.18**	*.21*	*.22*	*.27*	*.28*	*.21*	.10	**.20**
17. Dis w Amb	37.07 (5.73)	**-.29**	-.08	-.12	**-.28**	-.09	-.07	**-.36**	**-.17**
18. ClosedMind	24.76 (5.23)	**-.26**	.08	**-.40**	*.35*	.01	**-.17**	**-.53**	.06
19. MC10	4.26 (1.96)	*.23*	*.17*	*.29*	*.23*	*.18*	.13	**.18**	.13
20. AoC Resid	0.00 (1.00)	*.94*	*.23*	.08	.08	-.01	.04	.10	.04

Table 5 (continued).

Means, Standard Deviations, and Bivariate Correlations among Variables in Study 1

Note. 1. AoC = Acceptance of Complexity; 2. SWLS = Satisfaction with Life Scale; 3. ER-89 = Ego-Resiliency, 4. DR = Dispositional Resilience; 5. DR Commit = Commitment Subscale of DR; 6. DR Control = Control Subscale of DR; 7. DR Chall = Challenge Subscale of DR; 8. LOT-R = Life Orientation Test; 9. PHQ-9 = PHQ Depression Inventory; 10. OASIS = Overall Anxiety Severity and Impairment Scale; 11. IUS = Intolerance of Uncertainty Scale; 12. NfCognition = Need for Cognition; 13. NfClosure = Need for Closure; 14. Pre f Order = Preference for Order Subscale of NfClosure; 15. Pre f Predic = Preference for Predictability Subscale of NfClosure; 16. Decisive = Decisiveness Subscale of NfClosure; 17. Dis w Amb = Discomfort with Ambiguity Subscale of NfClosure; 18. ClosedMind = Closed-Mindedness Subscale of NfClosure; 19. MC10 = Marlowe-Crowne 10-item Short Scale; 20. AoC Resid = Acceptance of Complexity Residual (Partialing out IUS); Ns range from 149-163.

Italics = p < .08   **Bold = p < .05**   ***Bold & Italics = p < .01***

Table 5 (continued).

Means, Standard Deviations, and Bivariate Correlations among Variables in Study 1

	9	10	11	12	13	14	15	16	17	18	19	20
9	--											
10	*.65*	--										
11	*.38*	*.48*	--									
12	-.09	-.08	**-.21**	--								
13	-.04	.05	*.33*	*-.38*	--							
14	-.06	.08	*.27*	*-.28*	*.81*	--						
15	.05	*.15*	*.51*	*-.37*	*.76*	*.56*	--					
16	*-.14*	*-.26*	**-.34**	.12	*.33*	.14	-.06	--				
17	.14	*.22*	*.44*	**-.19**	*.61*	*.39*	*.50*	**-.17**	--			
18	-.03	.02	*.21*	*-.56*	*.63*	*.33*	*.40*	.07	*.25*	--		
19	-.07	-.13	**-.20**	*.25*	*-.15*	-.03	**-.17**	*.15*	*-.23*	*-.28*	--	
20	-.05	-.10	.00	.05	-.12	-.07	-.06	.07	-.14	**-.19**	**.18**	--

Note. 1. AoC = Acceptance of Complexity; 2. SWLS = Satisfaction with Life Scale; 3. ER-89 = Ego-Resiliency, 4. DR = Dispositional Resilience; 5. DR Commit = Commitment Subscale of DR; 6. DR Control = Control Subscale of DR; 7. DR Chall = Challenge Subscale of DR; 8. LOT-R = Life Orientation Test; 9. PHQ-9 = PHQ Depression Inventory; 10. OASIS = Overall Anxiety Severity and Impairment Scale; 11. IUS = Intolerance of Uncertainty Scale; 12. NfCognition = Need for Cognition; 13. NfClosure = Need for Closure; 14. Pre f Order = Preference for Order Subscale of NfClosure; 15. Pre f Predic = Preference for Predictability Subscale of NfClosure; 16. Decisive = Decisiveness Subscale of NfClosure; 17. Dis w Amb = Discomfort with Ambiguity Subscale of NfClosure; 18. ClosedMind = Closed-Mindedness Subscale of NfClosure; 19. MC10 = Marlowe-Crowne 10-item Short Scale; 20. AoC Resid = Acceptance of Complexity Residual (Partialing out IUS); Ns range from 149-163.

Italics = $p < .08$ **Bold** = $p < .05$ ***Bold & Italics*** = $p < .01$

Table 6.

Means, Standard Deviations, and Bivariate Correlations among Variables in Study 2

	M (SD)	1	2	3	4	5	6	7	8
1. AoC	4.45 (0.77)	--							
2. AAQ	5.05 (0.89)	*.28*	--						
3. MSTAT	4.18 (0.79)	*.29*	*.31*	--					
4. PMI	-0.00 (.65)	.02	.01	*.18*	--				
5. ER-89	41.64 (6.13)	.09	.13	*.22*	*.24*	--			
6. mRRQ	3.61 (0.74)	-.13	*-.38*	-.12	-.10	-.10	--		
7. IUS-12	2.64 (0.66)	*-.28*	*-.46*	*-.42*	-.08	*-.20*	*.42*	--	
8. Pro Anxiety	2.96 (0.69)	*-.29*	*-.28*	*-.34*	.01	-.12	*.34*	*.89*	--
9. Inh Anxiety	2.18 (0.85)	*-.20*	*-.55*	*-.39*	-.15	*-.24*	*.40*	*.86*	*.54*
10. PEt&f2004	0.01 (0.73)	-.04	*.19*	.03	*.19*	*.28*	*-.30*	-.07	.04
11. PEm2012	0.01 (0.74)	-.03	*.22*	.04	*.24*	*.28*	*-.32*	-.07	.03
12. AG1-Pleas	1.71 (1.70)	*.21*	.12	.09	-.06	*.26*	*-.24*	-.11	-.09
13. AG1-Arous	0.01 (2.01)	.11	.02	.15	-.05	.14	-.17	-.08	-.06
14. AG2-Pleas	.29 (2.22)	*.26*	*.19*	.03	.16	*.24*	*-.30*	-.11	-.06
15. AG2-Arous	-0.38 (2.03)	.15	*.19*	*.18*	-.09	*.21*	-.13	*-.26*	-.15
16. AoC Resid	0.00 (1.00)	*.96*	.00	*.21*	.02	.05	-.03	-.16	*-.21*
17. ER89 Resid	0.00 (0.99)	.04	.01	.00	.16	*.94*	.02	-.10	-.06
18. NE12	1.96 (0.69)	*-.24*	*-.39*	*-.24*	-.11	-.12	*.47*	*.39*	*.28*

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Table 6 (continued).

Means, Standard Deviations, and Bivariate Correlations among Variables in Study 2

Note. 1. AoC = Acceptance of Complexity; 2. AAQ = Acceptance and Action Questionnaire; 3. MSTAT = Multiple Stimulus Types Ambiguity Tolerance; 4. PMI = Positive Meaning Index; 5. ER-89 = Ego-Resiliency; 6. mRRQ = Modified Rumination and Reflection Questionnaire; 7. IUS-12 = Intolerance of Uncertainty Scale; 8. Pro Anxiety = Prospective Anxiety Subscale of IUS-12; 9. Inh Anxiety = Inhibitory Anxiety Subscale of IUS-12; 10. PEt&f2004 = Positive Emotion Composite (Tugade & Fredrickson, 2004); 11. PEm2012 = Positive Emotion Composite (Based on Study 2 Data); 12. AG1-Pleas = Baseline Affect Grid – Pleasantness Dimension; 13. AG1-Arous = Baseline Affect Grid – Arousal Dimension; 14. AG2-Pleas = Post-Positive Meaning Measure Affect Grid – Pleasantness Dimension; 15. AG2-Arous = Post-Positive Meaning Measure Affect Grid – Arousal Dimension; 16. AoC Resid = Acceptance of Complexity Residual (Partialing out AAQ); 17. ER89 Resid = Ego-Resiliency Residual (Partialing out MSTAT & PEcomp2); 18. NE12 = Average of 12 Negative Emotions from mDES; Ns range from 107-116.

Italics = p < .08   **Bold = p < .05**   ***Bold & Italics = p < .01***

Table 6 (continued).

Means, Standard Deviations, and Bivariate Correlations among Variables in Study 2

	9	10	11	12	13	14	15	16	17	18
9	--									
10	-.16	--								
11	-.17	*.96*	--							
12	-.10	.17	.15	--						
13	-.09	.15	.16	*.24*	--					
14	-.13	*.57*	*.52*	*.45*	*.17*	--				
15	*-.31*	.14	.10	.11	*.49*	.10	--			
16	-.05	-.10	-.10	*.19*	.11	*.21*	.10	--		
17	-.13	.01	.00	*.22*	.08	.11	.15	.04	--	
18	*.41*	*-.30*	*-.30*	*-.21*	-.04	*-.48*	-.05	-.14	.01	--

*Note. 1. AoC = Acceptance of Complexity; 2. AAQ = Acceptance and Action Questionnaire; 3. MSTAT = Multiple Stimulus Types Ambiguity Tolerance; 4. PMI = Positive Meaning Index; 5. ER-89 = Ego-Resiliency; 6. mRRQ = Modified Rumination and Reflection Questionnaire; 7. IUS-12 = Intolerance of Uncertainty Scale; 8. Pro Anxiety = Prospective Anxiety Subscale of IUS-12; 9. Inh Anxiety = Inhibitory Anxiety Subscale of IUS-12; 10. PEt&f2004 = Positive Emotion Composite (Tugade & Fredrickson, 2004); 11. PEm2012 = Positive Emotion Composite (Based on Study 2 Data); 12. AG1-Pleas = Baseline Affect Grid – Pleasantness Dimension; 13. AG1-Arous = Baseline Affect Grid – Arousal Dimension; 14. AG2-Pleas = Post-Positive Meaning Measure Affect Grid – Pleasantness Dimension; 15. AG2-Arous = Post-Positive Meaning Measure Affect Grid – Arousal Dimension; 16. AoC Resid = Acceptance of Complexity Residual (Partialing out AAQ); 17. ER89 Resid = Ego-Resiliency Residual (Partialing out MSTAT & PEcomp2); 18. NE12 = Average of 12 Negative Emotions from mDES; N*s range from 107-116.

Italics = p < .08   **Bold = p < .05**   ***Bold & Italics = p < .01***

Table 7.

Means and Standard Deviations for LIWC Dimensions for Participants' Writing Samples in Study 2

	Mean (Std. Dev.)
Word Count	280.05 (176.08)
Words Per Sentence	22.80 (6.79)
Past Tense	3.26 (3.04)
Present Tense	10.32 (3.41)
Future Tense	1.22 (1.06)
Social Processes (e.g., mate, talk, they, child)	6.67 (4.78)
Affect (e.g., happy, cried, abandon)	5.73 (2.14)
Positive Emotions	3.34 (1.53)
Negative Emotions	2.27 (1.41)
Anxiety	0.71 (0.79)
Anger	0.37 (0.52)
Sadness	0.45 (0.55)
Cognitive Processes (e.g., cause, know, ought)	20.73 (4.14)
Insight (e.g., think, know, consider)	3.85 (1.92)
Causation (e.g., because, effect, hence)	2.19 (1.07)
Discrepancy (e.g., should, would, could)	2.29 (1.39)

Table 7 (continued).

Means and Standard Deviations for LIWC Dimensions for Participants' Writing Samples in

Study 2

	Mean (Std. Dev.)
Tentative (e.g., maybe, perhaps, guess)	3.06 (1.56)
Certainty (e.g., always, never)	1.52 (1.00)
Inhibition (e.g., block, constrain, stop)	0.55 (0.61)
Inclusive (e.g., and, with, include)	5.41 (2.13)
Exclusive (e.g., but, without, exclude)	3.60 (1.68)
Perceptual Processes (e.g., observing, heard, feeling)	1.56 (1.05)
See (e.g., view, saw, seen)	0.33 (0.54)
Hear (e.g., listen, hearing)	0.18 (0.32)
Feel (e.g., feels, touch)	0.95 (0.82)

Note. N = 112.

Table 8.

Marginal and Significant Bivariate Correlations between mRRQ and LIWC Dimensions

	Correlation with mRRQ
Word Count	**.24**
Past Tense	*.18*
Social Processes (e.g., mate, talk, they, child)	**.23**
Positive Emotions	*-.18*
Negative Emotions	***.28***
Anxiety	*.18*
Anger	***.26***
Sadness	*.18*
Inclusive (e.g., and, with, include)	*.17*
Perceptual Processes (e.g., observing, heard, feeling)	**.22**
Feel (e.g., feels, touch)	*.17*

Note. $N = 112$.

Italics = $p < .08$ **Bold** = $p < .05$ ***Bold & Italics*** = $p < .01$

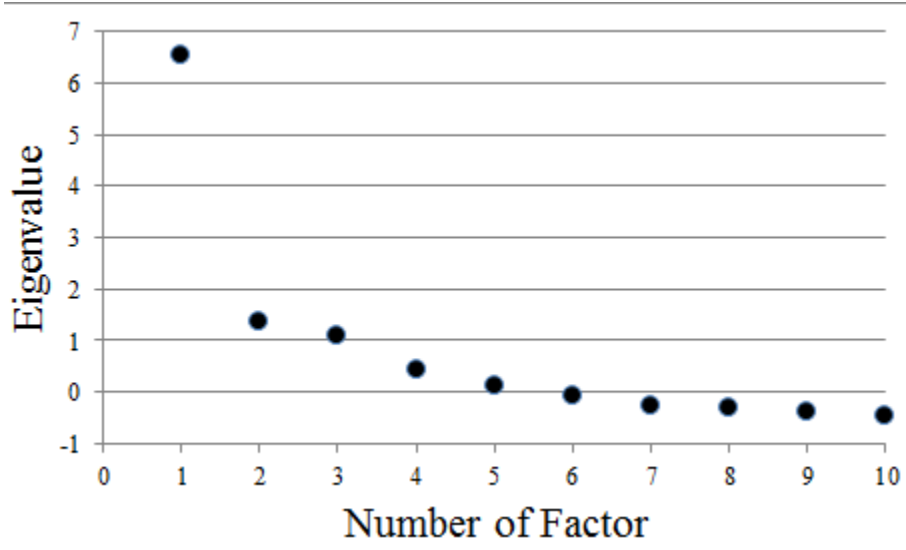Figure 1. Scree Plot from Exploratory Factor Analysis in Study 1.

Figure 2. Simultaneous Mediation Model in Study 2. Positive Emotionality (measured by the

PEm2012) and Ambiguity Tolerance (measured by the MSTAT-II) reduce the effect of Ego-

Resiliency (measured by the ER-89) on Positive Meaning Finding (measured by the Positive

Meaning Index) to nonsignificance. ** *p* < .01   * *p* < .05
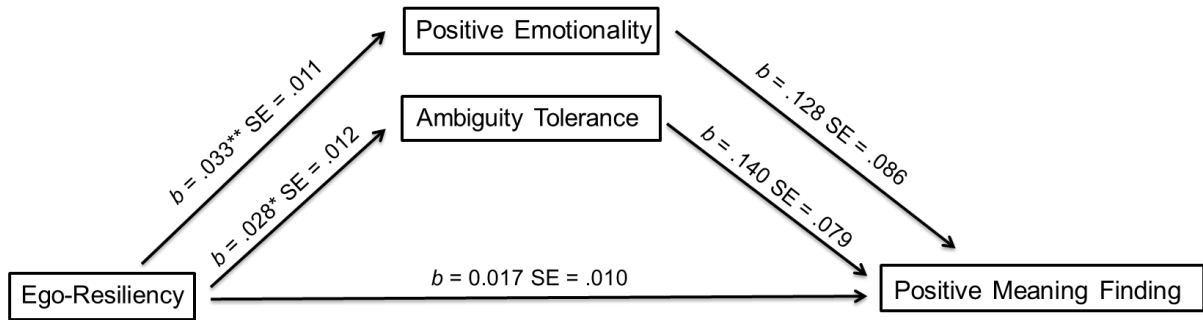
Appendix A:

32 Acceptance of Complexity Scale Items Administered in Study 1

Please read the following statements and rate how much you agree with each of them based on your own thoughts, feelings, and actions. There are no "right" or "wrong" answers. We are simply interested in how different people think and feel.
Please respond using the following 6-point scale:

1 = *strongly disagree*
2 = *moderately disagree*
3 = *slightly disagree*
4 = *slightly agree*
5 = *moderately agree*
6 = *strongly agree*

1. I am at peace with the complexity of the world.
2. Often times I think that there are endless ways to solve a problem.
3. Sometimes things are imperfect, but I'm okay with that.
4. I'm okay with the unknown in the world.
5. I accept that the world is a complex place.
6. It doesn't bother me that some things will never be perfect.
7. The unknown in the world doesn't worry me.
8. I accept that there are times when analyzing multiple other points of view are necessary.
9. I'm okay with situations that require analyzing multiple points of view.
10. It doesn't irritate me that there are some things in the world that will never be fully explained.
11. Complexity in the world doesn't bother me.
12. I accept that some things in the world will never be fully explained.
13. I generally have a good idea about what I'll be doing in ten years. *
14. In most conflicts, I try to find which side is right and which is wrong. *
15. Surprises make the world too difficult for me to understand. *
16. I hate that the world will never be fully explained. *
17. I've found that the world is full of multiple potential solutions to problems.
18. It doesn't bother me that some puzzles may not have a solution.
19. I think that it's best to think about the world in abstract ways.
20. I dislike concepts that can be explained in many different ways. *
21. I feel uncomfortable when I don't understand all the reasons why something happened. *
22. When considering most conflicts, I often see how both sides could be right or wrong.
23. I acknowledge that some problems don't have a straightforward answer.
24. Thinking about a difficult situation often stresses me out. *
25. Sometimes I think that there are too many variables that affect the world to consider.
26. I've found that there are always new ways to think about a difficult situation.
27. I believe that there's not always a straightforward solution to problems in the world.

28. I think that all choices in life have good aspects and bad aspects to them.
29. I always try to make the best out of a difficult situation.
30. It bothers me when I can't figure out the correct thing to do in a situation. *
31. I can always find a straightforward answer if I dig deep enough. *
32. In most complex situations, I feel like I could go either way and still be happy.

* Reverse-scored item

Appendix B:

Modified Rumination-Reflection Questionnaire (mRRQ) used in Study 2

Think back to your important personal problem that you just wrote about. For each of the following statements, please indicate your level of agreement or disagreement using the scale below.

1 = *strongly disagree*
2 = *disagree*
3 = *neutral*
4 = *agree*
5 = *strongly agree*

1. My attention is often focused on aspects of this problem I wish I'd stop thinking about.
2. I always seem to be "re-hashing" in my mind aspects of this problem.
3. Sometimes it is hard for me to shut off thoughts about this problem.
4. Long after this problem is over with, my thoughts keep going back to it.
5. I tend to "ruminate" or dwell over this problem for a really long time.
6. I don't waste time re-thinking this problem.*
7. Often I'm playing back over in my mind how I acted during this problem.
8. I often find myself re-evaluating this problem.
9. I never ruminate or dwell on this problem for very long.*
10. It is easy for me to put unwanted thoughts about this problem out of my mind.*
11. I spend a great deal of time thinking back over this problem.

* Reverse-scored item

REFERENCES

Affleck, G., & Tennen, H. (1996). Construing benefits from adversity: Adaptational significance and dispositional underpinnings. *Journal of Personality, 64,* 899-922.

Andrews, P. W., & Thomson, J. A. (2009). The bright side of being blue: Depression as an adaptation for analyzing complex problems. *Psychological Review, 116,* 620-654.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10,* 125–143.

Baron, R. S., Vandello, J. A., Brunsman, B. (1996). The forgotten variable in conformity research: Impact of task importance on social influence. *Journal of Personality and Social Psychology, 71,* 915-927.

Bartone, P. T., Ursano, R. J., Wright, K. M., & Ingraham, L. H. (1989). The impact of a military air disaster on the health of assistance workers. *Journal of Nervous and Mental Disease, 177,* 317-328

Block, J., & Kremen, A. M. (1996). IQ and ego-resiliency: Conceptual and empirical connections and separateness. *Journal of Personality and Social Psychology, 70,* 349-361.

Bond, F. W., & Bunce, D. (2003). The role of acceptance and job control in mental health, job satisfaction, and work performance. *Journal of Applied Psychology, 88,* 1057-1067.

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. C., Guenole, N., Orcutt, H. K., Waltz, T. & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological flexibility and experiential avoidance. *Behavior Therapy*, *42,* 676-688.

Buhr, K., Dugas, M. J. (2002). The intolerance of uncertainty scale: psychometric properties of the English version. *Behavior Research and Therapy, 40*, 931-945.

Burton, N. W., Pakenham, K. I., & Brown, W. J. (2010). Feasibility and effectiveness of psychosocial resilience training: A pilot study of the READY program. *Psychology, Health, & Medicine, 15,* 266-277.

Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48,* 306-307.

Cano, I., Hopkins, N., & Islam, M. R. (1991). Memory for stereotype-related material: A replication study with real-life social groups. *European Journal of Social Psychology, 21,* 349-357.

Carleton, R. N., Norton, P. J., & Asmundson, G. J. G. (2007). Fearing the unknown: A short version of the intolerance of uncertainty scale. *Journal of Anxiety Disorders, 21,* 105 117.

Chang, E. C., Maydeu-Olivares, A., & D'Zurilla, T. J. (1997). Optimism and pessimism as partially independent constructs: Relations to positive and negative affectivity and psychological well-being. *Personality and Individual Differences, 23,* 433–440.

Cohn, M. A., Fredrickson, B. L., Brown, S. L., Mikels, J. A., & Conway, A. M. (2009). Happiness unpacked: Positive emotions increase life satisfaction by building resilience. *Emotion, 9,* 361-368.

Coholic, D. A. (2011). Exploring the feasibility and benefits of arts-based mindfulness-based practices with young people in need: Aiming to improve aspects of self-awareness and resilience. *Child Youth Care Forum, 40,* 303-317.

Colvin, C. R., Block, J. (1994). Do positive illusions foster mental health? An examination of the Taylor and Brown formulation. *Psychological Bulletin, 116,* 3-20.

DeVellis, R. F. (2012). *Scale development: Theory and applications* (3rd ed)*.* London: Sage.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life. *Journal of Personality Assessment, 49,* 71-75.

Eschleman, K. J., Bowling, N. A., & Alarcon, G. M. (2010). A meta-analytic examination of hardiness. *International Journal of Stress Management, 17,* 277-307.

Flaxman, P. E., & Bond, F. W. (2010). A randomized worksite comparison of acceptance and commitment therapy and stress inoculation training. *Behavior Research and Therapy, 48*, 816-820.

Fiske, S. T., & Linville, P. W. (1980). What does the schema concept buy us? *Personality and Social Psychology Bulletin, 6,* 543-557.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York: Mcgraw-Hill.

Folkman, S. (1997). Positive psychological states and coping with severe stress. *Social Science & Medicine, 45,* 1207-1221.

Fractal. (n.d.). *The Free On-line Dictionary of Computing*. Retrieved December 28, 2011, from Dictionary.com website: http://dictionary.reference.com/browse/fractal.

Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: Positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology, 95,* 1045-1062.

Fredrickson, B. L., & Losada, M. F. (2005). Positive affect and the complex dynamics of human flourishing. *American Psychology, 60,* 678-686.

Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology, 84,* 365-376.

Geschwind, N., Peeters, F., Drukker, M., van Os, J., & Wichers, M. (2011). Mindfulness training increases momentary positive emotions and reward experience in adults vulnerable to depression: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 79,* 618-628.

Gilovich, T. (1987). Secondhand information and social judgment. *Journal of Experimental Social Psychology, 23,* 59-74.

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change.* New York: Guilford Press.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behavior Research and Therapy, 44,* 1-25.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64,* 1152–1168.

Higgins, E. T., & Bargh, J. A. (1987). Social cognition and social perception. *Annual Review of Psychology, 38,* 369-425.

Hull, J. G., Van Treuren, R. R., & Virnelli, S. (1987). Hardiness and health: A critique and alternative approach. *Journal of Personality and Social Psychology, 37,* 1–11.

Inman, M. L., Reichl, A. J., & Baron, R. S. (1993). Do we tell less than we know or hear less than we are told? Exploring the teller-listener extremity effect. *Journal of Experimental Social Psychology, 29,* 528-550.

Jaccard, J., Weber, J., & Lundmark, J. (1975). A multitrait-multimethod analysis of four attitude assessment procedures. *Journal of Experimental Social Psychology, 11,* 149-154.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10,* 144–156.

Kaplan, M. F., & Miller, C. E. (1987). Group decision making and normative versus informational influence: Effects of type of issue and assigned decision rule. *Journal of Personality and Social Psychology, 53,* 306-313.

Klohnen, E. C. (1996). Conceptual analysis and measurement of the construct of ego-resiliency. *Journal of Personality and Social Psychology, 70,* 1067–1079.

Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37,* 1-11.

Koerner, N., & Dugas, M. J. (2006). A cognitive-affective model of generalized anxiety disorder: The role of intolerance of uncertainty. In G. C. L. Davey & A. Wells (Eds.), *Worry & psychological disorders: Theory, assessment & treatment* (pp. 201-216). Chichester: John Wiley and Sons, Ltd.

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16,* 606-613.

Krosnick, J. A. (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. *Applied Cognitive Psychology, 5,* 213-236.

Lyubomirksy, S., & Holen-Hoeksema, S. (1993). Self-perpetuating properties of dysphoric rumination. *Journal of Personality and Social Psychology, 65,* 339-349.

Mayer, J. D., Rapp, H. C., & Williams, L. (1993). Individual differences in behavioral predictions: The acquisition of personal-action schemata. *Personality and Social Psychology Bulletin, 19,* 443-451.

McLain, D. L. (1993). Evidence of the properties of an ambiguity tolerance measure: The multiple stimulus types ambiguity tolerance scale-II (MSTAT-II). *Psychological Reports, 105,* 975-988.

Moos, R. H. (1988). *Coping responses inventory manual*. Palo Alto, CA: Stanford University and Department of Veterans Affairs Medical Centers.

Moran, D. J. (2010). ACT for leadership: Using acceptance and commitment training to develop crisis-resilient change managers. *International Journal of Behavior Consultation and Therapy, 6,* 341-355.

Muthén, B., & Muthén, L. (2008). *Mplus user's guide* (5th ed.). Los Angeles, CA: Muthén & Muthén.

Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment.* Englewood Cliffs, NJ: Prentice-Hall.

Norman, S. B., Cissell, S. H., Means-Christensen, A. J., & Stein, M. B. (2006). Development and validation of an overall anxiety severity and impairment scale (OASIS). *Depression and Anxiety, 23,* 245-249.

Pennebaker, J. W., Booth, R. J., & Francis, M. E. (2007). *Linguistic inquiry and word count: LIWC 2007.* Austin, TX: LIWC.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*, 879-891.

Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). The affect grid: A single-item scale of pleasure and arousal. *Journal of Personality and Social Psychology, 57,* 493-502.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the life orientation test. *Journal of Personality and Social Psychology, 67,* 1063-1078.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. T. (2002). Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse. New York: Guilford Press.

Semple, R. J., Lee, J., Rosa, D., & Miller, L. F. (2010). A randomized trial of mindfulness based cognitive therapy for children: Promoting mindful attention to enhance social-emotional resiliency in children. *Journal of Child and Family Studies, 19,* 218-229.

Sherif, M. (1936). *The psychology of social norms.* Oxford: Harper.

Sherman, S. J., Judd, C. M., & Park, B. (1989). Social cognition. *Annual Review of Psychology, 40,* 281-326.

Siebert, A. (1996). *The Survivor Personality*. New York: Pedigree Books.

Silver, R. C., Holman, E. A., McIntosh, D. N., Poulin, M., & Gil-Rivas, V. (2002). Nationwide longitudinal study of psychological responses to September 11. *Journal of the American Medical Association, 288,* 1235–1244.

Southwick, S. M., Vythilingam, M., & Charney, D. S. (2005). The psychobiology of depression and resilience to stress: Implications for prevention and treatment. *Annual Review of Clinical Psychology, 1,* 255-291.

Strahan, R., & Gerbasi, K. C. (1972). Short, homogeneous versions of the Marlowe-Crowne social desirability scale. *Journal of Clinical Psychology, 28,* 191-193.

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin, 103,* 193-210.

Taylor, S. E., & Brown, J. D. (1994). Positive illusions and well-being revisited: Separating fact from fiction. *Psychological Bulletin, 116,* 21-27.

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology, 68,* 615–623.

Thompson, R. W., Arnkoff, D. B., & Glass, C. R. (2011). Conceptualizing mindfulness and acceptance as components of psychological resilience to trauma. *Trauma, Violence, & Abuse, 12,* 220-235.

Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology, 76,* 284-304.

Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology, 86,* 320-333.

Tugade, M. M., & Fredrickson, B. L. (2007). Regulation of positive emotions: Emotion regulation strategies that promote resilience. *Journal of Happiness Studies, 8,* 311-333.

Watkins, E., & Baracaia, S. (2001). Why do people ruminate in dysphoric moods? *Personality and Individual Differences, 30,* 723-734.

Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology, 67,* 1049-1062.

Wirth, R. J., & Edwards, M. C. (2007). Item factor analysis: Current approaches and future directions. *Psychological Methods, 12, 58-79.*