



University of Pennsylvania  
**ScholarlyCommons**

---

Master of Applied Positive Psychology (MAPP) Capstone Projects    Master of Applied Positive Psychology (MAPP) Capstones

---

8-1-2020

## Metacognition and Living Above Zero

Mary Margaret Rogers  
*University of Pennsylvania*, [mmrogers@sas.upenn.edu](mailto:mmrogers@sas.upenn.edu)

Follow this and additional works at: [https://repository.upenn.edu/mapp\\_capstone](https://repository.upenn.edu/mapp_capstone)

 Part of the [Biological Psychology Commons](#), [Clinical Psychology Commons](#), [Cognition and Perception Commons](#), [Cognitive Psychology Commons](#), [Developmental Psychology Commons](#), [Other Psychology Commons](#), and the [Other Social and Behavioral Sciences Commons](#)

---

Rogers, Mary Margaret, "Metacognition and Living Above Zero" (2020). *Master of Applied Positive Psychology (MAPP) Capstone Projects*. 196.  
[https://repository.upenn.edu/mapp\\_capstone/196](https://repository.upenn.edu/mapp_capstone/196)

This paper is posted at ScholarlyCommons. [https://repository.upenn.edu/mapp\\_capstone/196](https://repository.upenn.edu/mapp_capstone/196)  
For more information, please contact [repository@pobox.upenn.edu](mailto:repository@pobox.upenn.edu).

---

## Metacognition and Living Above Zero

### Abstract

Metacognition is a multi-dimensional phenomenon consisting of knowledge and regulatory skills used to monitor, control, and appraise one's thoughts and thought processes (Schraw, 1998; Wells, 2009). This essay contends that metacognition is relevant to positive psychology and the non-clinical application of well-being practices as it may be utilized to promote self-efficacy, decrease anxiety, and increase well-being. Fortifying metacognitive processes (i.e. knowledge and regulation of cognition) is conceived to foster a sense of control regarding one's thoughts and behaviors, thereby increasing one's self-efficacy. Next, it is argued that metacognition may be used to decrease anxiety as the monitoring processes subsumed in metacognition offer a mechanism to manage the effects of cognitive processes which intersect emotional disturbance. An exploration of various existing therapies intends to show the subliminal presence of metacognition and its capacity to mitigate anxiety for those in the non-clinical population. Finally, it is hypothesized that metacognition may be utilized to increase well-being as knowledge and regulatory cognitive capacities permit one to appraise and manage cognitions, strategize, and modify behaviors which are more aligned with one's goals and values. Metacognitive skills may be employed to pursue practices which increase positive affect, encourage a positive sense of self, and generally promote flourishing.

### Keywords

metacognition, knowledge of cognition, regulation of cognition, positive psychology, well-being, self-efficacy, self-awareness, mindfulness, anxiety

### Disciplines

Biological Psychology | Clinical Psychology | Cognition and Perception | Cognitive Psychology | Developmental Psychology | Other Psychology | Other Social and Behavioral Sciences

Metacognition and Living Above Zero

Mary Margaret Rogers

University of Pennsylvania

A Capstone Project Submitted

In Partial Fulfillment of the Requirements for the Degree of

Master of Applied Positive Psychology

Advisor: Judy Saltzberg Levick, Ph.D.

August 1, 2020

Metacognition and Living Above Zero  
Mary Margaret Rogers  
mmrogers@sas.upenn.edu

Capstone Project  
Master of Applied Positive Psychology  
University of Pennsylvania  
Advisor: Judy Saltzberg Levick, Ph.D.  
August 1, 2020

### Abstract

Metacognition is a multi-dimensional phenomenon consisting of knowledge and regulatory skills used to monitor, control, and appraise one's thoughts and thought processes (Schraw, 1998; Wells, 2009). This essay contends that metacognition is relevant to positive psychology and the non-clinical application of well-being practices as it may be utilized to promote self-efficacy, decrease anxiety, and increase well-being. Fortifying metacognitive processes (i.e. knowledge and regulation of cognition) is conceived to foster a sense of control regarding one's thoughts and behaviors, thereby increasing one's self-efficacy. Next, it is argued that metacognition may be used to decrease anxiety as the monitoring processes subsumed in metacognition offer a mechanism to manage the effects of cognitive processes which intersect emotional disturbance. An exploration of various existing therapies intends to show the subliminal presence of metacognition and its capacity to mitigate anxiety for those in the non-clinical population. Finally, it is hypothesized that metacognition may be utilized to increase well-being as knowledge and regulatory cognitive capacities permit one to appraise and manage cognitions, strategize, and modify behaviors which are more aligned with one's goals and values. Metacognitive skills may be employed to pursue practices which increase positive affect, encourage a positive sense of self, and generally promote flourishing.

*Keywords:* metacognition, knowledge of cognition, regulation of cognition, positive psychology, well-being, self-efficacy, self-awareness, mindfulness, anxiety

**Table of Contents**

<b>Acknowledgements</b>	6
<b>Introduction</b>	7
<i>The Problem</i>	7
<i>What Is Anxiety?</i>	7
<i>My Journey</i>	9
<i>Metacognition: A Path to Living Above Zero</i>	9
<b>Positive Psychology: History and Overview</b>	11
<i>Living Above Zero</i>	12
<i>Psychotherapy and Getting to Neutral</i>	12
<b>Metacognition: An Overview</b>	13
<i>What is Metacognition?</i>	13
<i>Knowledge of Cognition</i>	14
<i>Regulation of Cognition</i>	15
<i>The Relationship Between Knowledge and Regulation of Cognition</i>	17
<i>What Metacognition Leads to</i>	18
<b>Metacognitive Components in Existing Therapies</b>	19
<b><i>Cognitive Behavioral Therapy</i></b>	20
<i>CBT and Information Processing</i>	20
<i>Cognitive Schemas in CBT</i>	21
<i>CBT Methods and Objectives</i>	22
<i>CBT In Practice</i>	23
<i>CBT Research and Effectiveness for Anxiety</i>	23

<i>CBT and Metacognition</i>	24
<b><i>Acceptance and Commitment Therapy</i></b>	24
<i>How Is ACT Different?</i>	25
<i>ACT's Approach</i>	25
<i>The Six Core Processes of ACT</i>	26
<i>ACT and Mindfulness</i>	28
<i>ACT Research and Effectiveness for Anxiety</i>	29
<i>ACT and Metacognition</i>	30
<b><i>Metacognitive Therapy</i></b>	30
<i>MCT Roots and the S-REF Model</i>	32
<i>How Is MCT Different?</i>	32
<i>The Metacognitive Control System</i>	33
<i>MCT Methods and Objectives</i>	33
<i>MCT Effectiveness for Anxiety</i>	34
<b>Positive Psychology, Metacognition, and Exploration of the “Self”</b>	35
<b><i>Self-Awareness</i></b>	35
<i>Self-Awareness and Metacognition</i>	36
<b><i>Mindfulness</i></b>	37
<i>Mindfulness and Metacognition</i>	38
<i>Mindfulness and Well-Being</i>	39
<b><i>Self-Efficacy</i></b>	40
<i>Self-Efficacy and Metacognition</i>	40
<i>Self-Efficacy and Well-Being</i>	41

Metacognition and Living Above Zero	5
<i>Self-Efficacy, Goals, and Performance</i>	42
<b>Pragmatic Tools to Bolster Metacognitive Capacities</b>	43
<i>Mindfulness Practice</i>	43
<i>Cognitive Tracking Through Journaling</i>	45
<i>Metacognitive Questioning</i>	46
<b>Future Directions</b>	47
<b>Conclusion</b>	47
<b>References</b>	49

### Acknowledgements

**To my advisor, Judy Saltzberg Levick**, thank you for your brilliant guidance, continued patience and compassion, seemingly endless knowledge of meaningful resources, and your unique ability to promote a sense of calm when the world felt like anything but that. Judy, I could not have done this without you. Thank you.

**To Marty Seligman**, thank you for your encouragement, warmth, and support. Your confidence and reassurance empowered me to pursue this topic. Most importantly, thank you for creating the community and family that is MAPP.

**To James Pawelski**, thank you for encouraging me to “try on a new pair of shoes.” Your kindness, compassion, and encouragement has profoundly inspired my life. Your wisdom and enthusiasm restored a sense of confidence and vitality to my voice and spirit.

**To Leona Brandwene, Laura Taylor, Nicole Stottlemeyer, Henry Edwards and the rest of the incredible MAPP team**, from the bottom of my heart, thank you. You are such a special group of individuals and I am honored to call you my mentors and friends.

**To MAPP.15**, my friends for life. You each inspire me in new, beautiful ways every single day. Your curiosity, kindness, intellect, and cheering, have genuinely restored my faith in humanity. You are the reason that MAPP is magical. Thank you; I love you.

**To the Golden Girls and my Grey Geese**, thank you for keeping me sane, grounded, and always laughing. I will be forever grateful for your support and love throughout this year.

**To my family at Big Deal Music and Harold Weinstein aka Hesh**, thank you for your encouragement, patience, and endless love. I certainly could not have done this without you.

**To my friends and family**, thank you for supporting me on this journey; I would not have made it here in one piece without you!

**Finally, to my parents**, for whom none of this would be possible. With immense gratitude and love, thank you for supporting my dreams and listening to my ramblings on metacognition. I love you dearly.



## **The Problem**

People are suffering from anxiety more than ever before. According to the National Institute of Mental Health (2017) anxiety disorders are the most common psychological disorder in the United States, affecting 40 million adults age 18 and older. In 2015, the World Health Organization (WHO) reported that 300 million people are living with an anxiety disorder throughout the world – a 14.9% increase since 2005. Furthermore, the prevalence of anxiety among adolescents age 18 and below is rising at an alarming rate. Since 2015, the American College Health Association (ACHA) has reported a substantial increase in the number of students who report having felt “overwhelming anxiety” any time within the last 12 months. In their Spring 2019 survey, ACHA reported that out of 54,497 undergraduate student respondents from 98 higher learning institutions, 66.4% felt “overwhelming anxiety” within the past year. This was a 3.5% increase from the Fall 2018 assessment and a 7.8% increase since the Fall 2015 report. Furthermore, in the Spring 2019 survey, out of the 66.4% of student’s who reported feeling “overwhelming anxiety,” only 24% reported being diagnosed or treated by a professional within the last 12 months; indicating that 42% of respondents experienced distressing affects from anxiety without any professional assistance. These figures suggest that while individuals may not be treated for anxiety professionally, or even meet the criteria for an anxiety disorder, an accelerating number of people are becoming unremittingly beleaguered by anxiety and its accompanying symptoms.

## **What is Anxiety?**

Anxiety is an emotional state characterized by the following symptoms: thoughts of worry and fear, feelings of muscle tension, physical instabilities such as increased blood pressure, rapid heartbeat, dizziness, and more (American Psychological Association, 2000).

Anxiety is a natural emotional state embedded in routine experiences, typically emerging in response to everyday triggers of stress. Anxiety has evolved from the primal reaction known as “fight-or-flight,” a stress response activated by the sympathetic nervous system in response to perceived danger, attack, or threat to survival (McGonigal, 2015). When triggered, the sympathetic nervous system floods the body with hormones such as cortisol and norepinephrine; these hormones heighten the senses, increase heart rate and blood pressure, and overwhelm the parasympathetic nervous system – the part of the brain responsible for physical relaxation and feelings of calmness (McGonigal, 2015). The fight-or-flight instinct is critical when faced with real danger, however, it also persists in times when it may not be needed (i.e. facing a non-life-threatening stressor).

Yerkes and Dodson (1908) recognized that extreme and nominal levels of anxiety and stress render negative consequences, but moderate levels may actually permit optimal functioning. A certain degree of anxiety may aid in productive and valuable functioning, as it can increase individual’s motivation and effort, mobilize energy, and improve performance and attention (McGonigal, 2015). Anxiety takes the form of a disorder when it becomes excessive and negatively influences one’s psychological state, relationships, work, and other life domains (American Psychological Association, 2000). In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), the American Psychiatric Association (2013) characterizes anxiety disorders as those which share features of excessive fear and anxiety and related behavioral disturbances.

One of the hallmarks of anxiety is destructive and irrational thinking. Anxious cognitions are future oriented, connected to thoughts involving physical or psychological threats (Tellegen, 1985; Beck & Perkins, 2001). Unhealthy anxiety consists of two prominent cognitive distortions:

involuntary fixation on concepts related to danger and threat and focusing on the worst possible outcome of a situation and overestimating the likelihood of its incidence (Beck, 1976).

### **My Journey**

It was through my journey treating generalized anxiety disorder (GAD) with cognitive behavioral therapy (CBT) in which I first became interested in the subject of cognition and subsequently metacognition, the knowledge and regulation of one's thoughts and thought processes (Flavell, 1979; Brown, 1978). It seemed almost too simple – to alter your thinking and sustain constructive behavioral changes, to facilitate positive transformation in your life, you must first acknowledge and examine your thoughts and thought processes. My experience in CBT helped me to better manage my anxiety, foster greater self-awareness, and discover new methods to enhance my personal growth and facilitate positive adaptation. This process eventually led me to discover positive psychology, the scientific study of human flourishing (Seligman, 2011). Positive psychology quickly became a passion of mine, and it was that passion which inspired me to pursue a Master of Applied Positive Psychology (MAPP) from the University of Pennsylvania.

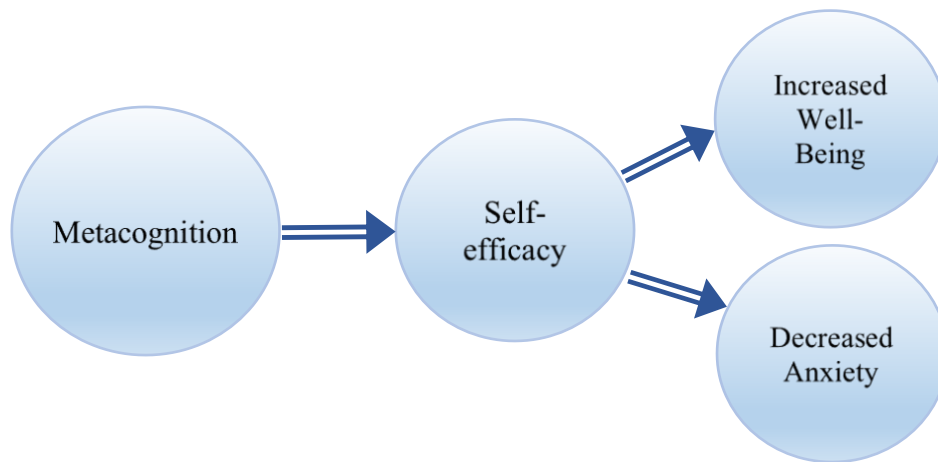
### **Metacognition: A Path to Living Above Zero**

This essay hypothesizes that metacognition can be employed in a non-clinical application to improve self-efficacy, decrease anxiety, and increase well-being among individuals. Figure 1 depicts the evolution of the proposed hypothesis. This essay will examine metacognition through the lens of positive psychology, with special attention to the promotion of self-efficacy. Leading scholar on self-efficacy, Albert Bandura (1977), defined the concept as the degree of conviction one has in their ability to influence personal behaviors and produce effective outcomes. It is conceived that metacognitive processes may foster a sense of control and thereby increase one's

self-efficacy. Bandura et al. (1999) noted that individuals who have a high sense of self-efficacy regarding thought control (i.e. regulating and managing one's cognitions and cognitive processes) can more effectively influence their behaviors and emotional states. Furthermore, those with greater self-efficacy tend to be more unaffected by negative psychological experiences as they believe they can stop their acceleration and perseveration (Bandura et al., 1999). As such, this essay proposes that metacognition may also be used to decrease anxiety, as the monitoring processes subsumed in metacognition offer a mechanism to manage the effects of cognitive processes which intersect emotional disturbance. Finally, it is hypothesized that metacognition may be utilized to increase well-being as these capacities permit one to appraise and manage cognitions, strategize, and modify behaviors to be more aligned with one's values and goals. Metacognitive skills may be employed to pursue practices which increase positive affect, encourage a positive sense of self, and generally promote flourishing.

**Figure 1.**

*Metacognition Leads to Decreased Anxiety and Increased Well-Being*



To be clear, this essay does not suggest that metacognition will eradicate anxiety or thrust one into a blissful state of flourishing. Rather, it argues that exploring cognitions and cognitive

processes – the foundation for which one bases their interpretation of themselves and their place in the world – is an essential area of focus for anyone seeking to advance their well-being.

### **Positive Psychology: History and Overview**

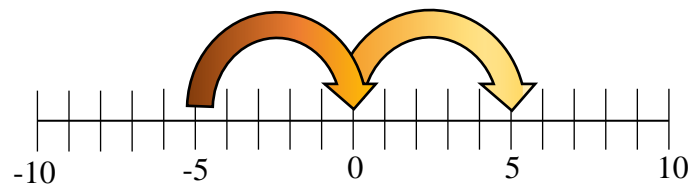
In his 1998 Presidential address to the American Psychological Association, Dr. Martin E.P. Seligman argued that psychology had come to disproportionately focus on remediating pathology, ignoring the positive aspects which make life most worth living. Seligman's seminal speech propelled him to establish positive psychology. A sub-field of psychology, positive psychology examines the elements of life which increase well-being and enable individuals to thrive (Seligman, 2011). According to Seligman's well-being theory, well-being is a construct with various measurable elements – positive emotions, engagement, relationships, meaning, and achievement. No single measurement defines the construct of well-being, rather each contribute to it. Positive psychology's goal is to bolster these elements and promote human flourishing (Seligman, 2011). Seligman (2011) noted that flourishing is the absence of the negative elements of human existence (depression, anxiety, anger, fear) and the presence of the positive ones (meaning, purpose, positive emotions, autonomy). Adler and Seligman (2016) recognized that well-being involves both hedonic well-being (feeling good) and eudaemonic well-being (functioning well). Positive psychology aims to understand the gestation of human flourishing through the examination of both hedonic and eudaemonic well-being. It attends to 'the good life' – that which humans choose to pursue when they are not suffering or oppressed (Seligman, 2011). This process is continuous and dynamic in nature, requiring intentional and effortful living that actualizes components of flourishing such as autonomy, self-efficacy, meaning, and more.

## Living Above Zero

Upon examining Seligman's (2011) exploration of flourishing, it is important to note that removing disabling conditions such as anxiety does not automatically facilitate positive and optimal functioning. If one wants to achieve well-being, it is certainly necessary to minimize suffering, but this step alone is not sufficient to flourish. In order to sustain 'the good life,' one must bolster the positive elements of living which enable one to thrive. To further understand this concept, consider Figure 2, a spectrum of well-being, with negative ten illustrating a state of ill-being, zero as neutral, and positive ten as thriving. If suffering from anxiety positioned an

**Figure 2**

*Well-Being Spectrum*



individual at negative five on the well-being spectrum, alleviating that anxiety would position them at zero (i.e. neutral); but in order to enter into a positive state of functioning (i.e. north of neutral), an individual would need to take additional steps to enact positive change. Historically, conventional psychology has focused on removing disabling conditions in order to move individuals out of a negative state (below zero) into a neutral zone (zero). The domains explored in positive psychology focus on enhancing well-being so as to function in the 'north of neutral' zone and live above zero.

## Psychotherapy and Getting to Neutral

As this essay explores moving from a negative state of functioning to living above zero, it is important to consider existing therapies which help individuals progress from a negative state of well-being to a neutral one. Before delving into those therapies, metacognition will be

introduced, as it is argued to be the thread which runs between existing psychotherapies, where one progresses from ill-being to neutral-being, and positive psychology, where one progresses from neutral-being to well-being. While this essay focuses on metacognition and well-being in non-clinical applications, exploring metacognition's presence in existing therapies intends to illustrate its capacity to mitigate suffering for the rapidly expanding population being negatively affected by anxiety.

### **Metacognition: An Overview**

Research on metacognition has predominantly emerged from work in cognitive development, educational psychology, memory performance, and neuropsychology with distinguishing contributions from Flavell (1979), Nelson and Narens (1990), Metcalfe and Shimamura (1994), and colleagues. More recently, research on metacognition has materialized from the investigation of cognitive control processes and psychological disorders with prominent contributions from Wells and Matthews (1994, 1996, 2009). This essay contends that metacognition is relevant to other areas of psychology, specifically positive psychology, and may be a beneficial area of investigation in the non-clinical application of well-being practices.

### **What is Metacognition?**

In his seminal essay on cognitive monitoring, developmental psychologist John Flavell (1979) actualized the concept of metacognition, defining it as knowledge (i.e. cognition) of cognitive phenomena; put simply, metacognition can be understood as thinking about one's thinking and thinking processes. Metacognition is a multi-dimensional phenomenon consisting of knowledge and regulatory skills used to monitor, control, and appraise one's thoughts and thought processes (Schraw, 1998; Wells, 2009). Adrian Wells explained metacognition using the following analogy: "Thinking can be likened to the activity of a large orchestra involving many

players and instruments. To produce an acceptable overture there must be a music score and a conductor. Metacognition is the score and the conductor behind thinking” (Wells, 2009, p. 1).

While the concept of metacognition is broad in scope, over time, psychologists’ characterizations of metacognition have largely coincided with Flavell’s original description. Moses and Baird (1999) observed metacognition as a process involving the knowledge and regulation of cognitive activity; Kuhn and Dean (2004) defined metacognition as the awareness and management of one’s own thoughts; and Wells (2009) described metacognition as an assortment of intersecting factors comprised of any knowledge or thought process involved in the interpretation, monitoring, or control of cognition. Deconstructing these definitions, metacognition has two fundamental components: knowledge of cognition and regulation of cognition. Table 1 displays a rendering of the field’s existing research on knowledge and regulation of cognition, outlining select frameworks and corresponding terminology, skills, and examples relevant to this essay.

### **Knowledge of Cognition**

The first component of metacognition, knowledge of cognition, refers to the accumulated knowledge – the beliefs and theories – one has about their own cognitions or about cognition in general (Wells, 2009; Schraw, 1998). Various frameworks distinguishing the constitutive components of knowledge of cognition have been presented over time. Three types of knowledge are integral to this discussion: knowledge of oneself as a cognitive processor, awareness of cognition and strategies to manage cognition, and metacognitive beliefs.

Within knowledge of oneself as a learner is declarative or explicit knowledge, that is knowledge “about” things or knowledge which is conscious and can be verbally expressed (e.g. “I think I am an anxious person;” Schraw, 1998; Wells, 2009). Within awareness of cognition



and strategies to manage cognition are two sets of terminology: procedural or implicit knowledge and strategy knowledge. Procedural or implicit knowledge is not typically subject to consciousness and cannot be expressed verbally; it represents the “thinking skills” individuals have and can be thought of as the “why” or the rules which guide cognitive processing (e.g. attention allocation, examination of memories, use of heuristics in forming judgments; Wells, 2009). Strategy knowledge constitutes the various strategies which may be useful to enhance a performance or achieve a goal (e.g. “Reciting positive affirmations to myself can improve my self-worth;” Flavell, 1979). Finally, metacognitive beliefs consist of both positive and negative beliefs about one’s thinking (Wells, 2009). Positive metacognitive beliefs are concerned with the advantages of engaging in cognitive activities such as worry, rumination, and engrossed attention (e.g. “Focusing on my weight helps me to stay healthy”); and negative metacognitive beliefs are those which concern the uncontrollability, meaning, importance, and dangerousness of thoughts and cognitive experiences (e.g. “Thinking about my anxiety makes me feel crazy;” Wells, 2009).

### **Regulation of Cognition**

The second component of metacognition, regulation of cognition, consists of the cognitive processes which occur during cognitive activities (i.e. planning, monitoring, control, and evaluation). Table 1 presents two types of regulation: strategy identification and selection and awareness of cognitive understanding and performance. Within strategy identification and selection are planning skills. Planning involves the selection of appropriate strategies and resources to affect an outcome (e.g. “Remembering to focus on my breath helps me feel less anxious;” Schraw, 1998). These strategies are the responses individuals make to control an activity during a cognitive enterprise (e.g. “Thinking about my past successes bolsters my confidence in the moment;” Wells, 2000).

**Table 1***Typology of Metacognitive Components*

Metacognitive Component	Type	Terminology / Skills	Example
Cognitive Knowledge	Knowledge about oneself as a cognitive processor	Declarative / Explicit knowledge	“Worrying too much will make me sick” “Having anxiety means I am dysfunctional and broken”
	Awareness of cognition and strategies to manage cognition	Procedural / Implicit knowledge	Making an educated guess; Having a ‘gut feeling;’ “Riding in elevators makes me feel claustrophobic”
		Strategy knowledge	“Thinking about how to address a problem with my partner will help me deal with it;” “Focusing on my strengths will help me to feel confident”
	Metacognitive Beliefs	Positive Metacognitive Beliefs	“Worrying about my grade will help force me to study for the test;” “Focusing on three good things will help me feel grateful”
		Negative Metacognitive Beliefs	“I have no control over my thoughts;” “Thinking terrible things will lead me to act on them;” “I think I’m ugly and therefore not worthy of love”
	Cognitive Regulation	Identification and selection of appropriate strategies and allocation of resources	Planning
Being aware of cognitive understanding and performance		Monitoring / Regulating / Evaluating	When feeling undervalued at work, intentional focus on contributing new insights; Asking oneself, “is this approach working?”

Next, within awareness of cognitive understanding and performance are monitoring, regulating, and evaluating. Monitoring, regulating, and evaluating refer to the metacognitive skills which enable one's awareness of their performance while engaging in an activity (e.g. "Is this approach working?" Schraw, 1998). These skills involve one's ability to adapt to a situation after assessing their strategy, resources, and performance evaluation (Schraw, 1998). It may enable one to adapt to a situation and enact a new response strategy (Schraw, 1998).

### **The Relationship Between Knowledge and Regulation of Cognition**

A widely accepted belief in theories of metacognition is that knowledge and regulation of cognition are mutually correlated (Schraw & Dennison, 1994). Schraw and Dennison (1994) examined this statistical relationship, finding that knowledge and regulation of cognition are in fact positively correlated. To measure adult's metacognitive awareness, Schraw and Dennison (1994) conducted two experiments using the Metacognitive Awareness Inventory (MAI), a 52-item self-report measure, with undergraduate psychology students at a large midwestern university. The MAI contains continuous scale questions, prompting subjects to draw a slash across the rating scale at a point which best corresponds to how true or false a statement is about themselves (Schraw & Dennison, 1994). In their findings, Schraw and Dennison (1994) reported a statistically significant relationship between knowledge and regulation of cognition, with  $r = .54$  and  $.45$ , respectively. This conclusion is consistent with previous theoretical accounts of metacognition and suggests that almost one-quarter of variance of one component of metacognition is attributable to the other (Schraw & Dennison, 1994). This finding suggests that by bolstering one component of metacognition, one may enjoy benefits in other metacognitive capacities.

### **What Metacognition Leads To**

This essay contends that metacognition and the higher order cognitive processes it encompasses may influence three areas: self-efficacy, anxiety, and well-being. It is hypothesized that metacognition may be utilized to strengthen one's sense of self-efficacy. This supposition is based on the idea that by developing and employing knowledge and regulation of cognition one may feel more in control of their mental processes which dictate behaviors and influence outcomes. In his reexamination of learned helplessness, Seligman (2018) noted that control is both a cognition and a cognition about the future, and "to have a contingency between a voluntary response and an outcome is to control that outcome" (Seligman, 2018, p. 125). Bandura (1977) distinguished between efficacy and outcome expectations, stating that an "efficacy expectation" consists of the belief that one can realize a desired outcome on their own accord, while an "outcome expectation" is the belief that a desired outcome will simply happen. Considering this conceptualization, self-efficacy is the belief that one can exert control over an outcome. Thus, metacognitive capacities (i.e. knowledge and regulation of cognition) may increase one's sense of self-efficacy as these higher order cognitive processes offer a method to control how one relates to their thoughts and thought processes. Next, it is hypothesized that metacognition may be utilized to decrease anxiety as the regulatory processes subsumed in metacognition offer a mechanism to manage the effects of psychological experiences which intersect emotional disturbance. The following section will examine metacognition's presence in existing therapies and illustrate its capacity to influence disruptive and irrational thinking and negative emotions which typically accompany anxiety. Furthermore, this exploration will confirm how effective various therapies – which incorporate metacognitive processes – are in treating anxiety, anxiety related disorders, and other psychological disorders. While the focus

will be on remediating pathology in the clinical population, this exploration intends to show how metacognitive practices (e.g. monitoring, regulating, strategizing, planning) may be utilized to mitigate anxiety for those in the non-clinical population. Finally, it is surmised that metacognition may be used as a tool to increase well-being as knowledge and regulatory cognitive capacities permit one to appraise and manage cognitions, strategize, and modify behaviors which are more aligned with one's goals and values. An exploration of various positive psychology concepts, methods, and practices which incorporate or enhance metacognitive capacities intends to show how metacognitive processes may be employed to pursue practices which increase positive affect, encourage a positive sense of self, generally promote flourishing, and enable one to "live above zero."

### **Metacognitive Components in Existing Therapies**

The following exploration of various successful therapies – their theories, methods, and research findings – aims to illustrate the subliminal presence of metacognition and the higher order cognitive processes it subsumes. Examining one's thoughts and thought processes has been an essential component of various therapies including cognitive behavioral therapy (CBT) and acceptance and commitment therapy (ACT). While metacognitive terminology has not been explicitly expressed in CBT or ACT, its function and elemental components are central to the theories and methodologies encompassed in both therapies. In recent years, research on metacognition has advanced, and it is even the foundation a newer therapy termed Metacognitive Therapy (MCT). Furthermore, this exploration will confirm how effective these various therapies – which incorporate metacognition – are in treating anxiety, anxiety related disorders, and various other psychological disorders. While the focus will be on remediating pathology in the

clinical population, this exploration intends to show metacognition's capacity to mitigate anxiety for those in the non-clinical population.

### **Cognitive Behavioral Therapy**

Over 50 years ago, American psychiatrist and “father of cognitive behavioral therapy,” Dr. Aaron T. Beck, established a system of psychotherapy aimed at treating depression called cognitive therapy (CT); Since its inception CT – generically referred to as cognitive behavioral therapy – has been utilized to treat various psychiatric disorders including anxiety disorders, phobias, substance abuse, personality disorders, suicide prevention, panic disorders, and most recently, schizophrenia (Beck, 2005).

### ***CBT and Information Processing***

The CBT system was built around the premise that information processing is essential for human survival and adaptation (Beck & Dozois, 2011). Information processing (i.e. one's cognitive system) is intricately connected to an individual's motivational, affective, and behavioral systems – all functioning collectively to achieve a specific result (e.g. avoiding pain and experiencing pleasure; Beck & Dozois, 2011). While the cognitive system offers critically important feedback based on internal and external stimuli, this feedback is inherently biased and can often lead to cognitive errors such as personalization, overgeneralization, and selective abstraction (Beck, 2005). As it pertains to the various disorders CBT treats, Beck (2005) notes that symptomatic responses are a result of one's cognitive bias (i.e. distorted understanding) which activate negative representations of the self, world, and future. While biases vary from person to person, emotional disorders have been shown to have recurrent themes and effects (Beck, 2005). Beck's (1976) cognitive content specificity hypothesis states that affective conditions are associated with unique cognitive content. In their meta-analysis of 13 studies,

Beck and Perkins (2001) found that depressive and anxious cognitive content shared significant variance with both depression and anxiety. Considering anxiety disorders, the cognitive model posits that emotional disturbance is a result of faulty cognitions regarding vulnerability, threat, and fear (Arch et al., 2012; Beck, 2005). Those with anxiety are pre-disposed to danger-oriented beliefs such as, “If I go outside at night, I will get mugged” (Beck, 2005).

### ***Cognitive Schemas in CBT***

CBT contends that psychiatric disorders are distinguished by the activation of a collection of related dysfunctional meanings, beliefs, and memories, which operate in coordination with behavior, affect, motivation, and physiological responses (Beck & Dozois, 2011). Mental health disorders often involve a complex interplay among diverse and interrelated systems; as cognition is a central component of this essay, further exploration of its role in CBT will be examined (Beck & Dozois, 2011). Beck and Dozois (2011) explain that within the cognitive system are varied levels of cognitions – surface-level thoughts (e.g. I don’t look pretty) and deeper cognitive schemas (e.g. I am ugly and will never find love). Cognitive schemas are memory structures of stored information that comprise individuals’ perceptions of themselves and others, goals, and expectations; they consist of accumulated representations of past experiences and embody generalizations which guide and form one’s experience (Beck & Dozois, 2011; Wells & Matthews, 1994). Schemas permit basic information processing, but become maladaptive when they are negatively biased, persistent, and self-perpetuating (Beck & Dozois, 2011). Maladaptive cognitive schemas are understood to be formed during early periods of one’s life span and become progressively organized as new experiences amalgamate with existing belief structures (Beck, 2011).

### ***CBT Methods and Objectives***

The foundation of CBT is Dr. Albert Ellis' (1957) cognitive model: the ABC Technique of Irrational Beliefs. The ABC model involves the identification and exploration of experienced cognitions, emotions, and behaviors (Ellis, 1991). In this model, "A" represents an activating event, "B" for the beliefs surrounding that event, and "C" for the emotional and behavioral consequences of those beliefs. Rooted in CBT, Reivich and Shatté (2002) built off of Beck and Ellis' work and offered the ABC model as a tool for non-clinical populations. It is one of their three "know thyself" skills designed to help an individual understand how their beliefs, feelings, and behaviors interact. Upon examining adversities, one may identify the domain in which those adversities most frequently occur (e.g. work, home), with whom they occur (e.g. boss, partner), and the nature of thoughts which accompany them. This process may aid in exposing patterns of both positive and negative cognitions and cognitive processes – a key objective in CBT.

When analyzing an event, distinguishing between unbiased facts and one's emotional response is a cognitive strategy which can assist in the isolation and adjustment of one's beliefs and belief system (Reivich & Shatté, 2002). This separation can help to untangle a mixture of emotions, further permitting one to determine the root cause of an affective experience (Reivich & Shatté, 2002). Incorporating metacognitive language, the analysis of one's beliefs and emotions may be considered the cognitive knowledge employed to manage self-awareness. Recognizing patterns in one's beliefs and consequences may be considered a regulatory skill used to clarify effective strategies to harness cognitive control (i.e. planning a different response, modifying a response in real-time).



***CBT In Practice***

CBT treatment emphasizes symptom reduction, progressively moving patients through the process of changing their thinking, mood, and behavior (Beck & Dozois, 2011). Individuals are encouraged to consider the accuracy and usefulness of their thoughts as they explore, analyze, and experiment with their validity (Beck & Dozois, 2011). Cognitive therapists employ a coordinated and collaborative approach using methods such as guided discovery and Socratic dialogue to help patients identify and modify their negative, underlying cognitive biases (Beck & Dozois, 2011). As each psychological disorder is characterized by its own stream of interconnected and automatic thoughts, a component of therapy is learning about one's cognitive processes and their effects in the context of a disorder (Beck, 1967). Given that the cognitions in anxiety are different from those in depression, treatment plans must be tailored to fit the needs of each individual. While treatment involves challenging multiple layers of thoughts using a variety of strategies, the first step in CBT is becoming aware of those thoughts and cognitive patterns, regardless of the disorder – a fundamental process of metacognition.

***CBT Research and Effectiveness for Anxiety***

CBT is one of the most extensively researched forms of psychotherapy with over 300 published outcome studies on cognitive-behavioral interventions (Butler, Chapman, Forman, & Beck, 2006). In their review of 16 meta-analyses examining the treatment outcomes of CBT, Butler et al. (2006) estimated the effect size to be 0.95 (SD = 0.08) – generally considered large at 0.8 or greater (Cohen, 1988) – for generalized anxiety disorder (GAD), unipolar depression, panic disorder, social phobia, post-traumatic stress disorder, and childhood depressive and anxiety disorders. Butler et al.'s (2006) research substantiates the efficacy of CBT for a wide range of psychiatric disorders including anxiety. CBT has been found to have both short-term

and long-term success in treating anxiety disorders. In a meta-analysis of 35 studies, Gould, Otto, Pollack, and Yap (1997) found a significant effect size ( $ES = 0.70$ ) for CBT for generalized anxiety disorder. Treatment was found to considerably decrease anxiety and worry, with effects being maintained for 6 to 12 months post-treatment (Gould et al., 1997). Finally, in a study of 17 patients with panic disorder, cognitive therapy was found to reduce the frequency of panic attacks and degree of cognitive dysfunction, with post-treatment effects being sustained at the 12-month follow-up (Sokol, Beck, Greenberg, Wright, & Berchick, 1989).

### ***CBT and Metacognition***

While CBT does not explicitly use the term “metacognition,” it inherently distinguishes the importance of examining one’s thoughts and thought processes (i.e. knowledge of cognition). CBT calls for the identification, evaluation, and modification of responses when addressing multiple layers of thoughts (Beck & Dozois, 2011). These processes can be considered regulatory skills as they support one’s awareness of their cognitive understanding and performance. As noted, regulation of cognition – the second component of metacognition – consists of cognitive activities such as planning, monitoring, control, and evaluation (Schraw, 1998). While CBT uses a variety of strategies to alter one’s thoughts and reduce symptoms of emotional disturbance, a preliminary step in treatment is to become aware of one’s cognitions – a basic metacognitive process.

### **Acceptance and Commitment Therapy**

Acceptance and Commitment Therapy (ACT) is an approach to psychological intervention focused on increasing psychological flexibility through the application of mindfulness, acceptance, and behavior change methods (Hayes, Strosahl, & Wilson, 1999; Hayes, Luoma, Bond, Masuda, & Lillis, 2006; McCracken & Vowles, 2014). Hayes et al. (2006)

defined psychological flexibility as the capacity to extend or modify behavior in the context of the present moment, in accordance with one's values and goals. In non-clinical terms, ACT urges individuals to connect to the present moment, accept whatever negative thoughts and emotions arise, and adapt their behavior accordingly so as to function in a value-driven manner. ACT has emerged as an effective treatment for those struggling with psychological disorders such as anxiety, depression, eating disorders, social anxiety and more (Hayes, Levin, Plumb-Villardaga, Villatte, & Pistorello, 2011).

### ***How is ACT different?***

ACT, often considered a “third wave” behavioral therapy, differs from traditional behavioral therapies in that it promotes a more holistic approach to health and well-being, encouraging the cultivation and adoption of mindfulness-based strategies and psychological flexibility (Arch et al., 2012). Unlike CBT, which challenges negative thoughts and emphasizes the reduction of symptoms, ACT assumes a functional and contextual approach to psychological experiences, encouraging individuals to accept their negative psychological experiences (Hayes & Brownstein, 1986). ACT does not recognize thoughts and feelings as either helpful or unhelpful, and thus minimizes the importance of their form, appearance, or frequency (McCracken & Vowles, 2014).

### ***ACT's Approach***

ACT aims to assess whether psychological experiences can be observed to influence patterns of behavior, and whether psychological methods can successfully manipulate psychological experiences (McCracken & Vowles, 2014). It focuses on the manner in which cognitive and non-cognitive processes interact with one another to influence behavior. Cognitive processes include thinking, judging, analyzing, and processing information, while non-cognitive

processes consist of thought patterns, feelings, and behaviors influenced by external stimuli (McCracken & Vowels, 2014). According to ACT, when cognitive-based processes govern one's behavior and other sources of influence are closed off, the culminating result is psychological inflexibility and ineffective behavior that is misaligned with one's goals and values (McCracken & Vowels, 2014; Hayes et al., 1999). Consequently, ACT aims to enhance psychological flexibility and encourage behavior that is open, mindful, and engaged (Hayes et al., 2006). ACT utilizes six fundamental processes to guide patients through therapy and offer a framework for strengthening their psychological flexibility; these processes are acceptance, cognitive defusion, being present, self as context, values, and committed action (Hayes et al., 2006).

### *The Six Core Processes of ACT*

Acceptance involves the deliberate embrace of distressing thoughts and feelings invoked from one's memory without attempts to alter their form or frequency (Hayes et al., 2006). Hayes et al. (2006) note that acceptance is not an end in itself, rather, it is a means to foster value-driven behavior which arises after one accepts and releases emotional disturbances. For example, patients with anxiety are taught to completely feel their symptoms without defense; this process may allow one to let go of the negative psychological experience and move towards enacting goal-oriented and value-driven behaviors (Hayes et al., 2006).

Next, cognitive defusion is a technique used to change the way a person interacts with or relates to their thoughts by forming contexts in which the undesirable functions of those thoughts are reduced (Hayes et al., 2006). Cognitive defusion aims to decrease the quality of a thought by diminishing one's tendency to treat it as true (Hayes et al., 2006). For example, rather than thinking "I am a bad person" the patient is encouraged to view this thought for what it is directly experienced to be, the thought "I am a bad person." Defusion strategies intend to promote a more

open and accepting attitude toward thoughts, without overt attempts to change the content of those thoughts (Rector, 2011). Examples of cognitive defusion include noting a thought for what it is – a thought, and observing a cognition arrive and depart without preoccupation (Hayes et al., 2006).

Being present is the third core process in ACT which involves the practice of being in continuous, non-judgmental contact with one's thoughts and feelings in the natural environment in which they occur (Hayes et al., 2006). ACT encourages individuals to experience the world in a more direct manner so that their behavior can be adjusted to align with their values in the current context of an experience (Hayes et al., 2006). Being present may permit flexible approaches for one to gain control over their behavior, observing experiences without judgment (Hayes et al., 2006). A tactical example of being present is utilizing language to recognize, define, and describe thoughts, feelings, and other events without trying to predict or judge them (Hayes et al., 2006).

Next, self as context supports the notion that people are not the sum of the content of their thoughts, emotions, or experiences. In ACT, the "self" is understood as a process through which one frames various life experiences. Self as context is the self who is experiencing life through ever-changing contexts and perspectives (Hayes et al., 2011). Self as content (i.e. the conceptualized self) is the "I" who is described and defined in terms of the content of one's psychological experiences (Hayes et al., 2011). Self as context allows one to recognize that there is a "self" outside of their current experience. Hayes et al. (2006) note the significance of this process, stating that it is through this perspective in which an individual can be mindful of their experiences without an attachment or investment in them. Self as context is nurtured in ACT through mindfulness exercises, metaphors, and experiential processes (Hayes et al., 2011).

In the context of ACT, values consist of qualities individuals choose to invest in with purposive action (Hayes et al., 2006). While these qualities cannot be achieved as objects, they can be embodied in each moment and may help individuals to live more meaningful lives (Hayes et al., 2006). ACT discourages processes that instigate behaviors rooted in avoidance (e.g. “I will focus on ‘Y’ so I do not have to address ‘X’,” social compliance (e.g. “A good person would value ‘X’”), or fusion (e.g. “My parents would like me to value ‘Y’;” Hayes et al., 2006). ACT encourages patients to adopt values in various life domains and uses a range of methods to help them live in accordance with those values (Hayes et al., 2011).

The final core process is committed action. ACT supports individuals in their pursuit and development of value-driven actions (Hayes et al., 2006). Committed actions comprise concrete objectives which can be effectively achieved as short- and long-term value-driven goals (Hayes et al., 2006). Hayes et al. (2006) state that committed action can be cultivated through goal setting, skills acquisition, and behavior change methods.

The six core processes in ACT intersect and connect to promote and strengthen psychological flexibility (Hayes et al., 2006). These processes can be organized into two groupings: mindfulness and acceptance processes, which consist of acceptance, defusion, being present, and self as context; and commitment and behavior change processes, which involve being present, self as context, values, and committed action (Hayes et al., 2006). Being present and self as context are included in both categories as all psychological experiences of conscious human beings involve the “now as known” (Hayes et al., 2006).

### ***ACT and Mindfulness***

A fundamental component of ACT which is absent in CBT and traditional behavioral therapy is the concept of mindfulness and its comprising techniques, exercises, and processes.

Mindfulness as a general approach aims to bring a person's awareness to the present moment. In ACT, mindfulness practices attend to this goal, while also attempting to facilitate an individual's openness to whatever psychological experiences occur in the present moment (Zettle, 2016). Mindfulness exercises aim to challenge "excessive literality" by creating a more conscious, aware, and open approach to psychological experiences (Hayes et al., 2011). Examples of mindfulness practices in ACT include asking patients to close their eyes, imagine a difficult experience, and observe who is noticing (Hayes et al., 2011). Contemplative and mindfulness homework is frequently used to help patients experience a mode of mind which is less judgmental, more curious, appreciative, flexible, and open (Hayes et al., 2011). Mindfulness meditation, variations of breath work, and "just noting" are additional mindfulness exercises incorporated in ACT. As it is a prominent area of focus in positive psychology, mindfulness will be explored in greater detail later in this essay.

### ***ACT Research and Effectiveness for Anxiety***

ACT has attracted a great deal of interest since its development in 1999, as studies of its efficacy as a holistic approach to psychological disorder have quickly emerged. In a meta-analysis of 60 randomized controlled trials on the efficacy of ACT across psychiatric disorders Öst (2014) reported that ACT is "possibly efficacious" for anxiety, depression, psychotic symptoms, and drug abuse. Authors of the Society of Clinical Psychology (Division 12) of the American Psychological Association evaluated ACT's evidence base to be one step above that of Öst, reporting that it had "modest research support" for variations of anxiety, depression, and psychotic symptoms. It is important to note that some debate exists on the scientific development strategies used to evaluate the long-term progress of traditional CBT and "third wave" behavioral therapies like ACT. Hayes et al. (2011) argue that the strategies used to test the efficacy of

behavioral treatments are not substantial in the following capacities: philosophical assumptions of an approach are often not clarified, basic processes are frequently overlooked, and theories are typically narrowly focused and vague. As evidence for ACT has primarily been established using conventional protocols, future evaluations which satisfy both traditional and contemporary proponents may advance research in the field and offer a more comprehensive and fully formed analysis of the efficacy of ACT.

### ***ACT and Metacognition***

Similar to CBT, ACT does not explicitly use the language of “metacognition” in its approach. In metacognitive language, ACT utilizes knowledge of cognition to examine thoughts which enter one’s consciousness. It incorporates regulation of cognition to establish appropriate strategies to accept and release negative psychological experiences and adapt behavior accordingly to proceed in the most effective, value-driven manner. Though ACT uses a variety of strategies to help individuals accept their cognitions and emotional reactions, its approach inherently requires a variety of metacognitive capacities.

### **Metacognitive Therapy**

Metacognitive therapy (MCT) emerged in 2009 and has since proven to be an innovative treatment for various psychological disorders including anxiety and depression (Normann & Morina, 2018). Similar to ACT, MCT differs from existing therapies in that it focuses less on the content of one’s cognitions and more on the patterns of processing one engages in with those cognitions. Central to MCT is the notion that metacognition is critically important to understand how cognition functions and how it creates the conscious experiences we have of ourselves and the world around us (Wells, 2009). Leading scholar on MCT, Adrian Wells (2009), proposes that metacognition is responsible for healthy and unhealthy control of the mind. Within MCT is the



belief that people become ensnared in emotional distress because their metacognitive knowledge has caused a negative style of processing and behavior termed the cognitive attentional syndrome (CAS; Wells, 2009). According to Wells (2019), the CAS is a state of cognitive processing which emerges when a person assigns too much attention to their own thoughts (the content of which is often maladaptive) and can lead to other problematic behaviors such as avoidance, suppression, or substance abuse. In CAS, negative information pertinent to the self is emphasized often becoming extended and repetitive (Wells, 2019). Thinking processes contained in the CAS include worry, rumination, and attentional strategies such as “threat-monitoring” (Wells, 2008). Worry and rumination are primarily verbal thinking styles which occur in response to automatic negative thoughts; they involve an individual’s examination of potential threats and their attempts to discover solutions to problems or ways of avoiding danger (Wells, 2008). Worry and rumination are conceptualized as a coping mechanism, though Wells (2008) notes that these styles are in fact problematic as they tend to prolong anxiety and negative affect and focus an individual’s attention on thoughts and processes which reinforce dysfunctional knowledge. Worry and rumination also inhibit self-regulatory procedures necessary for emotional processing (Wells, 2008). “Threat-monitoring” is when an individual fixates on sources of internal and external threat or negative information (Wells, 2008). Like worry and rumination, threat monitoring is viewed as a coping mechanism, but actually causes an increased awareness of threats, amplified anxiety, and incidence of negative thoughts (Wells, 2008). According to Wells (2008), the negative automatic thoughts of CBT (e.g. “I am a bad partner”) are considered merely triggers for the true pathological processes contained in the CAS. As negative thinking styles emerge from metacognitive beliefs, MCT treatment focuses on altering those metacognitive beliefs rather than on the content of one’s cognitions.

### ***MCT Roots and the S-REF Model***

Wells and Matthews' (1994, 1996) self-regulatory executive function (S-REF) model is the groundwork on which MCT was built. Rooted in cognitive psychology, research around the S-REF model was focused on cultivating an understanding of the mechanisms behind psychological disorder through the analysis of laboratory-based data on attention bias and differences in individual's stress responses (Wells, 2019). Within the S-REF model is the understanding that most psychological disorders are the result of the CAS, and since CAS is caused by an individual's metacognitive knowledge, that knowledge may be subsequently linked to emotional distress and psychological disorders (Wells, 2019).

### ***How is MCT different?***

MCT's methodology differs from pre-existing cognitive therapies in numerous ways. First, clinical psychology emphasizes memory and the content of one's cognitions, contending that psychopathology is a result of memory structures (i.e. cognitive schemas) from which automatic biases in cognitive processing emerge (Wells, 2019). Wells and Matthews (1994, 1996) challenged this prevailing view arguing that psychological disorders were a result of a decline in volitional cognitive control (i.e. the selection of self-regulation strategies). Second, MCT differs from existing therapies in that it focuses less on the content of one's thoughts and more on why individuals re-generate negative thoughts (Wells, 2009). MCT asserts that the content of cognitive appraisals and beliefs in the form of negative declarative statements such as, "I am a failure as a partner" does not clarify why an individual chose to focus on scrutinizing their failures and continue on with that kind of negative processing. This notion calls to question one's attentional bias or cognitive regulation, as it is a person's choice whether or not they

maintain this style of cognitive processing and continue perseverating on their failures (Wells, 2019).

### ***The Metacognitive Control System***

Wells (2019) distinguishes between the cognitive system (CS) and the metacognitive control system (MCS) to effectively conceptualize information processing. Worry, rumination, judgements, and the implementation of behaviors all occur within the CS, while control, decision-making processes, knowledge supporting control, and information on the present condition of cognitions are all attributes of the MCS (Wells, 2019). The MCS contains both declarative and procedural metacognitive knowledge which direct the activities of the cognitive system (Wells, 2019). Wells (2019) contends that MCS is the source of disorder and attentional bias, but it is in the cognitive system where this disorder is observed. Maladaptation in the MCS is the principal cause of extended negative processing (i.e. the CAS) occurring in the cognitive system (Wells, 2019). Based on this conceptualization, MCT treatment includes extracting metacognitive knowledge from the MCS and modifying it in the cognitive system before returning the knowledge back to the MCS (Wells, 2019). So, rather than focusing on the thought “the world is a dangerous place” (which occurs in the cognitive system) the focus would be on one’s relationship to that repetitive thought (which occurs in the metacognitive system).

### ***MCT Methods and Objectives***

MCT treatment focuses on reducing the CAS and modifying metacognition so that individuals with psychological disturbances can recover (Wells, 2019). Various techniques are aimed at modifying both declarative and procedural knowledge while controlling the cognitive system and its processing load (Wells, 2019). Techniques such as meta-level discourse, attention training, rumination postponement, and metacognitive experiments are used to expand the range,

choices, and flexibility with which an individual manages and can connect to their cognitive system (Wells, 2019). In MCT, the therapist recovers and alters the validity of declarative metacognitions while also recovering and re-writing the commands (i.e. procedural metacognitions) for regulating cognitive processing (Wells, 2019). To better understand this approach Wells (2019) offered the following example: in treating someone with low self-esteem, a cognitive therapist might ask questions like, “What is the evidence you are a failure? Is there another way to view the situation?” Whereas a metacognitive therapist would ask the client “What is the point of scrutinizing your failures?” The metacognitive therapist would proceed to implement techniques which encourage the patient to pause and abandon the perseverative thought processes which extend the negative idea or belief (Wells, 2019). This approach allows the patient to realize that processing is acquiescent and subject to control – in spite of whatever beliefs and thoughts may exist.

### ***MCT Effectiveness for Anxiety***

In their meta-analysis of 25 studies examining the efficacy of MCT, Normann and Morina (2018) found that MCT is an effective treatment for a range of psychological issues, with the strongest evidence existing for anxiety and depression. Numerous trials have examined the effects of MCT against CBT for generalized anxiety, and in each case MCT was found to be more effective (Van der Heiden, Muris, & Van der Molen, 2010; Wells et al., 2010; Nordahl et al., 2018). While the majority of published studies investigate MCT for anxiety and depression, preliminary data suggests that MCT can be employed to treat other disorders such as alcohol abuse, borderline personality disorder, and more (Caselli et al., 2018; Nordhal & Wells, 2019).

### **Positive Psychology, Metacognition, and Exploration of the “Self”**

Thus far, this essay has introduced positive psychology and the case for living above zero, examined the presence of metacognition in existing therapies, and illustrated how metacognitive practices (e.g. monitoring, evaluating, managing, strategizing) may be utilized to mitigate anxiety. The following section explores various positive psychology concepts which incorporate and enhance metacognitive processes and generally promote well-being. An examination of self-awareness, mindfulness, and self-efficacy intends to show the role of metacognition as it pertains to the pursuit of well-being.

#### **Self-Awareness**

Self-awareness is the ability to direct attention toward oneself in an observant and evaluative manner (Silvia & O'Brien, 2004). While self-awareness may prompt one to focus on their undesirable qualities and result in feelings of negative affect, disappointment, or anxiety, self-awareness is also replete with beneficial aspects which permit positive functioning and enable one to enjoy the good life (Mor & Winquist, 2002; Silvia & O'Brien, 2004). Silvia and O'Brien (2004) noted that self-awareness can positively impact various aspects which influence well-being such as self-control, self-esteem, perspective-taking, and creative accomplishments (Silvia & O'Brien, 2004).

Self-awareness facilitates self-control in that it enables one to evaluate whether their behavior meets societal or personal standards and criteria (Silvia & O'Brien, 2004). When attempting to achieve a standard or recognize a goal, self-awareness allows one to feel personally responsible for an achieved success (Silvia & O'Brien, 2004). In a study examining the effects of self-awareness on internal and external attributions of success, Duval and Silvia (2002) found that when individual's self-awareness was high, they enjoyed greater self-esteem in response to a

success – an important contributor of well-being linked to feelings of pride and positive affect (Duval & Silvia, 2002). Concerning perspective-taking, self-awareness is essential for social interactions and communication as it allows one to understand that their viewpoint may differ from others (Silvia & O'Brien, 2004). Furthermore, Batson (1991) noted that perspective-taking encourages more empathetic responses to the plights of others. Regarding creative accomplishments, Silvia and O'Brien (2004) argue that self-awareness encourages creative individuals to recognize which of their ideas and products are good or bad, finished or incomplete, derivative or novel. Moreover, self-awareness allows one to critique their own work and continue striving for improvements (Silvia & O'Brien, 2004). In sum, self-awareness may help one achieve their goals, establish healthy relationships, achieve success at work, enhance their creative capacities, and generally improve their functioning. It may be surmised that it is through self-awareness in which one may recognize their strengths and weaknesses and develop their values and goals so as to achieve purposeful and lasting personal growth, change and progress.

### ***Self-Awareness and Metacognition***

As it pertains to metacognition, self-awareness may be considered a preliminary step as one must be aware of their own thoughts and thought processes before they can influence them. One may conceive a more profound understanding of self through the exploration of metacognitive knowledge (i.e. knowledge about oneself as a cognitive processor, awareness of cognition and strategies to manage cognition, and metacognitive beliefs). The greater one's self-awareness, the greater their capacity to understand whether or not certain cognitions and psychological experiences are valid and supportive to their functioning. Furthermore, an individual who has a more developed awareness of self may be more attuned to the

metacognitive beliefs which positively contribute to well-being. For example, “focusing on three good things each day will help me to feel gratitude and joy,” is a cognitive strategy that is understood to be effective because an individual has achieved enough self-awareness to recognize its positive impact on their personal functioning. Together, self-awareness and metacognition may facilitate the understanding of cognitions and cognitive processes which positively influence behaviors that support well-being.

### **Mindfulness**

A concept often explored in positive psychology is mindfulness, a process of enhanced awareness which emerges from paying attention to the present moment with intention, curiosity, and without judgment (Kabat-Zinn, 2003). The concept of mindfulness emerged in Buddhism which conceives that unexamined behaviors or an “untrained mind” contribute to human suffering – both one’s own and that of others (Kabat-Zinn, 2003). The Buddhist tradition of meditative practice aims to “train the mind” utilizing mindfulness to examine behaviors, calm and clarify the mind, open awareness and attention, and refine action (Kabat-Zinn, 2003). Over the past 40 years, mindfulness meditation and mindfulness as an attentional stance have been integrated into Western psychology, medicine, and culture (Keng, Smoski, & Robins, 2011). According to the Western perspective, mindfulness is a flexible mental process which leads to a cognitive state characterized by non-judgmental awareness of the present moment; it involves sensations, cognitions, bodily states, consciousness, and environment, and encourages openness, curiosity, and acceptance (Hofmann & Gómez, 2017; Bishop et al., 2004; Langer, 2009).

Mindfulness in application involves looking at one’s own thoughts, behaviors, and emotions (typically labeled as “good” or “bad”) through a nonevaluative lens (Langer, 2009). It encourages one to allow themselves to be where they are without judgment, and to understand the

inner and outer landscape of an experience in each moment (Kabat-Zinn, 2003). Mindfulness practice often illuminates the extent of how modified and distorted human's experiences are when they are habitual and unexamined (Kabat-Zinn, 2003). To think mindfully is to assess why a thought, behavior, or emotion is being experienced, and to consider alternative responses or outcomes without self-recrimination (Langer, 2009). Living mindfully requires an understanding that everything is context-dependent and dynamic and thus requires one to be open to new information, engaged, and adaptive (Langer, 2009). Mindfulness as a practice takes a variety of forms. From structured practices such as meditation, yoga, body scanning, and mindful walking, to more informal exercises which aim to increase general awareness in daily life, mindfulness requires intentional practice as it develops over time.

### ***Mindfulness and Metacognition***

Mindfulness practice intersects with metacognitive processes in numerous ways. Mindfulness and metacognition both involve the examination of one's thoughts and thought processes, and both inherently promote self-awareness. A specific component of mindfulness practice which incorporates metacognition is reappraisal, the exploration of one's thoughts and feelings regarding a particular situation (Dahl, Lutz, & Davidson, 2015). This act of attentional shifting is akin to knowledge of cognition in that it brings awareness to one's thoughts. Self-appraisal permits the regulation of cognition as one's understanding of their knowledge and performance enables them to identify appropriate strategies regarding how to respond in the present moment (Smalley & Winston, 2010). It is surmised that over time, mindfulness practice which incorporates enhanced awareness of cognition may illuminate patterns of positive and negative metacognitive beliefs, further develop one's self-awareness, and elucidate purposive actions which are in accordance with one's values.



### ***Mindfulness and Well-Being***

Research on the efficacy of mindfulness practice illustrates its capacity to positively influence emotions, decrease stress and emotional disturbance, improve physical and emotional health, and enhance cognitive abilities. Mindfulness has been found to produce positive psychological effects including increased subjective well-being, reduced psychological symptoms and emotion reactivity, and improved behavioral regulation (Keng et al., 2011). In a study of 174 adults in a mindfulness-based therapy program, Carmody and Baer (2007) found that mindfulness practice (e.g. meditation, yoga, body scanning) reduced psychological symptoms and increased psychological well-being. In their study examining the effects of meditation on happiness, Smith, Compton, and West (1995) found that individuals who regularly practiced meditation were happier (both in frequency and intensity) and experienced less anxiety and depression. In a meta-analysis of 10 before-and-after studies, Khoury et al. (2013) reported a significant effect for mindfulness treatments and anxiety. These findings illustrate that mindfulness practices may not only increase one's positive affect, they may also reduce symptoms of emotional disturbance and generally improve well-being.

The antithesis of mindfulness, mindlessness, consists of behavior without thoughtful attention; it is governed by rules and routines that are ignorant to context or perspective, and may be considered as functioning on "automatic pilot" (Langer, 2009). According to Langer (2009), individuals predominantly function in a mindless state, adopting values, emotional responses, and behaviors without any kind of mindful appraisal or questioning. These elements shape well-being – to accept them without question can be likened to taking a backseat to one's own life, surrendering control to whomever or whatever exposes information, and accepting it as the "best" or "right" way to function. Moreover, this kind of processing is generally edited,

unsubstantial, and often involves alienation from direct experience of the sensory world and the body (Kabat-Zinn, 2003). To increase mindfulness is to welcome authority over one's own well-being.

### **Self-Efficacy**

A component of well-being often explored in positive psychology is self-efficacy, one's belief surrounding their ability to coordinate skills they possess and effectively adapt to dynamic and challenging circumstances (Bandura, Freeman, & Lightsey, 1999; Maddux, 2002).

Bandura's (1997) self-efficacy theory is grounded in the principle that psychological processes serve as a mechanism for creating and strengthening expectations of personal efficacy. Further stated, one's confidence in their ability to produce desired effects through their own actions is a principal determinant of the kinds of responses individuals choose to enact, and how much effort they will exert to achieve a certain outcome (Maddux, 2002).

### ***Self-Efficacy and Metacognition***

As noted, this essay hypothesizes that metacognition (i.e. one's knowledge and regulation of cognition) may be utilized to increase self-efficacy and promote well-being. Metacognitive capacities offer a method to control how one relates to their thoughts and thought processes. For example, the thought, "I will never find love," is a cognition which could increase anxiety and potentially trigger a panic attack. Developing knowledge about oneself as a cognitive processor may diminish the disconcerting effects of this thought as one is now familiar with its form, appearance, and frequency. Furthermore, knowing appropriate regulatory strategies to manage this cognition (e.g. suppressing thoughts, shifting attention, examination of cognitive validity) may help one to avoid a panic attack and maintain continual functioning. As self-efficacy is the belief that one can exert control over an outcome, this example illustrates how metacognitive

processes may be utilized to control the effects of a psychological experience. Moreover, operating metacognitive capacities (i.e. knowledge and regulation of cognition) may increase self-efficacy as one now has a sense of control over a cognitive process which impacts an outcome.

Bandura et al. (1999) noted that individuals who have a high sense of self-efficacy regarding thought control can more effectively influence their behaviors and emotional states.

[...] The exercise of control over one's own consciousness is of considerable import to personal well-being. To the extent that people can regulate what they think, they can influence how they feel and behave. [...] The self-regulation of thought processes, therefore, plays a significant role in the maintenance of emotional well-being. [...] The exercise of control over anxiety arousal in activities involving some risks may require development not only of coping efficacy but also of efficacy in controlling dysfunctional apprehensive cognitions. (Bandura et al., 1999, p. 145)

Those with greater self-efficacy tend to be more unaffected by negative psychological experiences as they believe they can stop their acceleration and perseveration (Bandura et al., 1999). Therefore, employing one's metacognitive knowledge and regulatory skills is presumed to increase self-efficacy and positively influence one's emotional and behavioral states. These metacognitive capacities can be utilized to increase one's well-being as they permit the appraisal and management of cognitions, planning of effective strategies, and subsequent modification of behavior which is more supportive of one's goals and values.

### ***Self-Efficacy and Well-being***

Research on self-efficacy has provided valuable insights into how individuals guide their behavior in pursuit of well-being (Maddux, 2002). Those who have a resilient sense of efficacy

feel less hopeless and more in control when attempting to improve their life conditions (Bandura et al., 1999). Maddux (2002) notes that when individuals are more in control of their behavior, thoughts, feelings, and environment they feel more equipped to confront challenges in life, foster healthy relationships, and accomplish personal fulfilment and peace of mind. Furthermore, self-efficacy has been found to influence the adoption of healthy behaviors like exercise and stress management, the cessation of unhealthy behaviors such as alcohol and drug abuse, and the maintenance of positive changes in the face of adversity (Maddux, 2002; Bandura, 1997; Maddux et al., 1995). Therefore, metacognition may not only increase self-efficacy, it may also prompt positive behaviors which accompany self-efficacy and further contribute to the promotion of well-being.

### ***Self-Efficacy, Goals, and Performance***

Next, self-efficacy has been shown to influence an individuals' goals and performance (Bandura et al., 1999). Concerning goals, the greater one's efficacy beliefs are in a life domain (e.g. relationships, work), the grander their goals will be within that domain in the future (Maddux, 2002). This positive contagion is not restricted to just one area – when an individual is engaged and committed to an exercise and is persistent in ensuring the conclusion of that exercise, that sense of self-efficacy and control may spread to other areas of one's life (Ratey & Hagerman, 2008).

In addition to influencing goals, self-efficacy is also a critical component of performance (Bandura et al., 1999). In this context, performance refers to one's execution of efforts and strategies. As self-efficacy encompasses both skills and the efficacy beliefs to use those skills effectively, it may have a significant impact on one's performance (Bandura et al., 1999). Self-efficacy influences actions both directly and indirectly through cognitive, motivational,

decisional, and affective determinants – all essential contributors to performance (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003). Efficacy beliefs alone do not predict performance, rather, it is an individual's efforts, their actions or "doing" which permit certain outcomes. Therefore, intentionally nurturing self-efficacy may positively influence one's goals, performance, and functional states in a variety of life domains. Bolstering metacognitive components to enhance self-efficacy may also permit activities which enhance well-being as one's performance and behavior is now aligned with their goals and values.

### **Pragmatic Tools to Bolster Metacognitive Capacities**

Schraw (1998) reported that metacognition and its constitutive components, knowledge and regulation of cognition can be enhanced through a variety of instructional strategies. Exercises which incorporate the exploration, management, monitoring, and evaluation of one's thoughts and thought processes may offer a method to develop one's metacognitive capacities. An overview of various non-clinical tools which promote knowledge and regulation of cognition is presented below.

#### ***Mindfulness Practice***

Mindfulness has been presented as an exercise which influences both metacognition and well-being. As noted, mindfulness practice involves the examination of one's thoughts and thought processes (i.e. knowledge of cognition) and requires one to monitor their cognitions in order to maintain a state of mindfulness (i.e. regulation of cognition). Implementing mindfulness practice into one's daily routine may strengthen their self-awareness and generally improve their capacity to understand and employ various metacognitive skills. For example, improving one's metacognitive regulatory skills may strengthen one's ability to plan, evaluate, and strategize cognitive approaches which are most appropriate and beneficial in a situation. Therefore,

mindfulness practice is recommended as a reasonable tool which may further one's metacognitive skills and permit one to simultaneously benefit from its positive effects on one's well-being (e.g. reduced stress and emotional disturbance, improved physical and emotional health). An entire essay could be dedicated to mindfulness exercises which incorporate and promote metacognition, a preliminary list and overview of various approaches to bolster one's metacognitive capacities is as follows:

- **Breath Work:** Close your eyes and focus on your breathing; Notice how the air moves in and out of your body and where you feel it – in your chest, belly; Focusing on a particular element of your breath may be helpful (e.g. the sound, pace, location); Count 10 inhales, then start again, and complete this process for at least 5 minutes; If your mind wanders, bring your attention back to your primary of focus (e.g. where you feel your breath, the number 1, etc.).
- **Attentional Shifting:** Focus on a particular sound, smell, or object for an extended period of time (e.g. go to a park and observe the trees and flowers – their texture, movement, color, smell).
- **Mindful Eating:** While eating, notice the texture, feel, taste, and temperature of your food; Strive to remain present and mindful of each bite.
- **Body Scanning:** Focus on the sensations in your body; Slowly move from the top of your head to the bottom of your feet, examining how each body part feels (e.g. relaxed, tense, loose, etc.).
- **Mindful Walking:** While walking, examine the manner in which your feet touch the ground, noticing how each step feels; Pay attention to areas of your body (e.g. your calves, hips, pelvis, arms), and how they work together to move you forward

### *Cognitive Tracking Through Journaling*

Reflecting on one's thoughts and thought processes may foster a greater understanding of their metacognitive knowledge and enhance one's metacognitive regulatory capacities.

Furthermore, examining the interplay between cognitions, emotions, and physiological responses is an exercise which may promote self-awareness, mindfulness, and self-efficacy – positive psychology concepts which may be employed to positively influence one's well-being.

Journaling is a feasible and accessible tool for those attempting to enhance their metacognitive understanding and skills.

Journal writing has been found to be an effective tool to promote reflective thinking which supports one's internal dialogue (Colton & Sparks-Langer, 1993). In their study on the effects of journaling about a stressful event, Ullrich and Lutgendorf (2002) reported that compared to participants who wrote solely about emotions, those who wrote about cognitions and emotions connected to a stressful experience developed a greater awareness of the positive benefits resulting from that experience. Therefore, it is surmised that recording thoughts as they enter one's consciousness may be a valuable exercise to promote awareness of internal experiences and develop one's metacognitive capacities. Noting emotional responses (both positive and negative), physical reactions, and situational aspects which accompany a thought may further help to establish patterns in cognitive processing. When writing, it may be helpful to try and discern which component of a psychological experience occurs first (i.e. thought, emotion, physiological response). Recording this experience may help illuminate certain patterns, triggers, and cognitive processes. This exercise is surmised to enhance one's ability to employ metacognitive skills as it requires both the awareness and regulation of cognition. Table

2 displays an example of how one might track their cognitions and cognitive experiences in order to bolster their metacognitive abilities.

**Table 2**

*Cognitive Tracking*

Type of Conscious Experience	Before	During	After	Description of Cognitive Response
Conscious Cognitions	--	“I did something wrong”	“I am a failure”	Negative
Conscious Emotions	--	Panic	Anxiety & Sadness	Negative
Conscious Physical Experiences	--	Heart rate increases	Shoulders tense up	Negative
Conscious Situational Aspects	Receiving a stern email from your boss	--	--	--

*Metacognitive Questioning*

Self-questioning which directs one’s attention to metacognitive components may offer an opportunity for one to enhance their cognitive knowledge and regulatory skills. The following questions are examples of how one might frame questions to bolster metacognitive capacities:

- “Is weighing myself every day helping me to lose weight?”
- “Did my thoughts prolong my anxiety? Did they curtail or mitigate it?”
- “Is this the best approach to this situation?”
- “Is worrying about this helping me?”
- “What am I accomplishing by thinking about this?”



Asking questions which focus on both positive and negative cognitions is important. While it may feel uncomfortable or even anxiety provoking to explore negative cognitions, it is an essential step to understanding cognitions and recognizing cognitive processes and patterns.

### **Future Directions**

As noted, research on metacognition has predominantly emerged from work in cognitive development, educational psychology, memory performance, neuropsychology, and most recently, in the investigation of cognitive control processes and psychological disorders in MCT. Future metacognitive research should focus on adults as the majority of literature and scientific studies have concentrated on the cognitive development and educational psychology of adolescents. In the field of cognitive psychology, additional research on metacognition's capacity to explain emotional distress is of critical importance. Future studies are needed to test the extent to which individuals can improve metacognitive ability and the best methods for doing so. Research on metacognition in non-clinical populations may also be of interest. Research on metacognition and its capacity to enhance or diminish one's well-being is a concept of considerable interest. Additional research on metacognition's ability to influence other areas of positive psychology such as positive relationships, purpose, accomplishments, and positive health outcomes may also be of significance.

### **Conclusion**

This essay has examined metacognition through the lens of positive psychology, demonstrating its capacity to promote self-efficacy, decrease anxiety, and increase well-being. Metacognition was presented as a mechanism to strengthen one's self-efficacy as its processes (i.e. knowledge and regulation of cognition) may foster a sense of control regarding how one relates to and manages their psychological experiences. For example, selecting cognitive

strategies (a metacognitive skill) which benefit one's performance may effectively influence how responsible they feel for a realized success (e.g. "Thinking about my past accomplishments bolsters my confidence in the moment"). Next, metacognition was presented as a capacity to mitigate anxiety as its regulatory processes may be utilized to manage the effects of cognitions which intersect emotional disturbance. An examination of existing psychotherapies such as CBT, ACT, and MCT presented metacognition as the thread which runs between their various approaches to treat anxiety and other psychological disorders. While these therapies focused on the clinical population, the presence of metacognition in their methodologies suggests its capacity to decrease anxiety which negatively affects the non-clinical population. As the number of individuals suffering from anxiety and its accompanying symptoms is rapidly growing, accessible methods which may reduce its effects are of critical importance. Furthermore, this essay has presented metacognition as a beneficial area of investigation in the non-clinical application of well-being practices studied in positive psychology. More proficient metacognitive abilities may enact a greater capacity for one to appraise cognitions, strategize, and invest in activities which validate one's sense of self, support living in accordance with one's values, and generally promote flourishing. An examination of various positive psychology concepts such as self-awareness, mindfulness, and self-efficacy presented metacognition as a feasible tool to enhance one's well-being. Finally, pragmatic tools to enhance metacognitive capacities and future directions for research were presented. In sum, with intention, practice, and application, metacognition and the higher order cognitive processes it subsumes may be an effective method to positively influence well-being and inspire one to "live above zero."

## References

- Adler, A. & Seligman, M. E. P. (2016). Using wellbeing for public policy: Theory, measurement, and recommendations. *International Journal of Wellbeing*, 6(1), 1-35. doi:10.5502/ijw.v6i1.429
- American College Health Association. American College Health Association-National College Health Assessment II: Reference Group Undergraduates Executive Summary Fall 2015. Hanover, MD: American College Health Association; 2016.
- American College Health Association. American College Health Association-National College Health Assessment II: Undergraduate Student Executive Summary Fall 2018. Silver Spring, MD: American College Health Association; 2018.
- American College Health Association. American College Health Association-National College Health Assessment II: Undergraduate Student Executive Summary Spring 2019. Silver Spring, MD: American College Health Association; 2019.
- American Psychiatric Association. (2013). Anxiety Disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596.dsm05>
- American Psychological Association. (2000). Anxiety. Retrieved July 20, 2020, from <https://www.apa.org/topics/anxiety/>.
- Baime, M. (2019). Neuroscience review for medical students in MED 589: Mindfulness and Mind-Body Medicine. Unpublished manuscript.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. doi:10.1037//0033-295X.84.2.191

- Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., & Pastorelli, C. (2003). Role of affective self-regulatory efficacy in diverse spheres of psychosocial functioning. *Child development, 74*(3), 769-782.
- Bandura, A., Freeman, W. H., & Lightsey, R. (1999). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Batson, C. D. (1991). *The altruism question: Toward a social-psychological answer*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Beck, A. T. (1967). *Depression: Causes and treatment*. Philadelphia, PA: University of Pennsylvania Press.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York, NY: International Universities Press.
- Beck, A. T. (2005). The current state of cognitive therapy: A 40-year retrospective. *Archives of General Psychiatry, 62*, 953-959. doi:10.1001/archpsyc.62.9.953
- Beck, A. T., & Alford, B. A. (2009). *Depression: Causes and treatment (2nd ed.)*. Philadelphia, PA: University of Pennsylvania Press.
- Beck, A. T., & Dozois, D. J. (2011). Cognitive therapy: Current status and future directions. *Annual Review of Medicine, 62*, 397-409. <https://doi.org/10.1146/annurev-med-052209-100032>
- Beck, J. S. (2011). *Cognitive behavior therapy: Basics and beyond (2nd ed.)*, New York, NY: Guilford Press.
- Beck, R., & Perkins, T. S. (2001). Cognitive content-specificity for anxiety and depression: A meta-analysis. *Cognitive Therapy and Research, 25*(6), 651-663.  
doi:10.1023/A:1012911104891

- Brown, A. L. (1978). Knowing when, where, and how to remember: A problem of metacognition. In R. Glaser (Ed.), *Advances in instructional psychology, Vol. 1* (pp. 77-165). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Brown, K. W., & Ryan, R. M. (2015). A self-determination theory perspective on fostering healthy self-regulation from within and without. In S. Joseph (Ed.), *Positive psychology in practice: Promoting human flourishing in work, health, education, and everyday life* (2nd ed., pp. 139-157). Hoboken, NJ: Wiley.
- Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: a review of meta-analyses. *Clinical Psychology Review, 26*(1), 17-31.
- Carmody, J., & Baer, R. A. (2007). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine, 31*(1), 23-33.
- Caselli, G., Martino, F., Spada, M. M., & Wells, A. (2018). Metacognitive therapy for alcohol use disorder: A systematic case series. *Frontiers in Psychology, 9*.  
doi:10.3389/fpsyg.2018.02619
- Clark, D. A., & Beck, A. T. (2011). *Cognitive therapy for anxiety disorders: Science and practice*. New York, NY: Guilford Press.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New York, NY: Routledge Academic.
- Colton, A. B., & Sparks-Langer, G. M. (1993). A conceptual framework to guide the development of teacher reflection and decision making. *Journal of Teacher Education, 44*(1), 45-55.

- Dahl, C. J., Lutz, A., & Richardson, R. J. (2015). Reconstructing and deconstructing the self: Cognitive mechanisms in meditation practice. *Trends in Cognitive Sciences, 19*(9), 515-523.
- Duval, T. S., & Silvia, P. J. (2002). Self-awareness, probability of improvement, and the self-serving bias. *Journal of Personality and Social Psychology, 82*(1), 49.
- Ellis, A. (1957). Rational Psychotherapy and Individual Psychology. *Journal of Individual Psychology, 13*(1), 38-44.
- Ellis, A. (1991). The revised ABC's of rational-emotive therapy (RET). *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 9*(3), 139-172.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist, 34*(10), 906-911.
- Garner, R. (1987). *Metacognition and reading comprehension*. Norwood, New Jersey: Ablex Publishing.
- Gould, R. A., Otto, M. W., Pollack, M. H., & Yap, L. (1997). Cognitive behavioral and pharmacological treatment of generalized anxiety disorder: A preliminary meta-analysis. *Behavior Therapy, 28*(2), 285-305. doi:10.1016/S0005-7894(97)80048-2
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001) *Relational frame theory: A post-Skinnerian account of human language and cognition*. New York, NY: Kluwer Academic/Plenum Publishers.
- Hayes, S. C., & Brownstein, A. J. (1986). Mentalism, behavior-behavior relations, and a behavior-analytic view of the purposes of science. *The Behavior Analyst, 9*(2), 175-190. <https://doi.org/10.1007/BF03391944>

- Hayes, S. C., Levin, M. E., Plumb-Villardaga, J., Villatte, J. L., & Pistorello, J. (2011). Acceptance and commitment therapy and contextual behavioral science: Examining the progress of a distinctive model of behavioral and cognitive therapy. *Behavior Therapy, 44*(2), 180-198. <https://doi.org/10.1016/j.beth.2009.08.002>
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy, 44*(1), 1-25. <https://doi.org/10.1016/j.brat.2005.06.006>
- Hayes S. C., Strosahl, K., & Wilson, K. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY: Guilford Press.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10*(2), 144-156.
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chapleau, M. A., Paquin, K., & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33*(6), 763-771.
- Kuhn, D. (2000). Metacognitive development. *Current Directions in Psychological Science, 9*(5), 178-181.
- Kuhn, D. & Dean, D. (2004). Metacognition: A bridge between cognitive psychology and educational practice. *Theory Into Practice, 43*(4), 268-273.  
[doi:10.1207/s15430421tip4304\\_4](https://doi.org/10.1207/s15430421tip4304_4)
- Locke, E. A. (1996). Motivation through conscious goal setting. *Applied and Preventative Psychology, 5*, 117-124.
- Maddux, J. E. (1995). Self-efficacy theory. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 3-36). New York, NY: Plenum Press.

- Maddux, J. E. (2009). Self-efficacy: The power of believing you can. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology*, (pp. 335-341). New York, NY: Oxford University Press.
- Martinez, M. E. (2006). What is metacognition? *Phi Delta Kappan*, 87(9), 696-699.  
<https://doi.org/10.1177/003172170608700916>
- McGonigal, K. (2015). *The upside of stress: Why stress is good for you, and how to get good at it*. New York, NY: Penguin Random House.
- Metcalfe, J., & Shimamura, A. P. (1994). *Metacognition: Knowing about knowing*. Cambridge, MA: MIT Press.
- Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin*, 128(4), 638-662. <https://doi.org/10.1037/0033-2909.128.4.638>
- Moses, L. J. and Baird, J. A. (1999). Metacognition. In R. Wilson (Ed.) *Encyclopedia of Cognitive Neuroscience*. Cambridge, MA: MIT Press.
- National Institute of Mental Health (2017). *Any Anxiety Disorder*. Retrieved July 20, 2020, from <https://www.nimh.nih.gov/health/statistics/any-anxiety-disorder.shtml>.
- Nelson, T. O., & Narens, L. (1990). Metamemory: A theoretical framework and new findings. In G. H. Bower (Ed.), *The Psychology of Learning and Motivation*, 26, (pp. 125-173).
- Nordahl, H. M., Borkovec, T. D., Hagen, R., Kennair, L. E. O., Hjemdal, O., Solem, S., et al. (2018). Metacognitive therapy versus cognitive-behavioural therapy in adults with generalised anxiety disorder. *BJPsych Open*, 4, 393-400. doi:10.1192/bjo.2018.54



- Nordhal, H. M., & Wells, A. (2019). Metacognitive therapy of early traumatized patients with borderline personality disorder: A phase-II baseline controlled trial. *Frontiers in Psychology, 10*. doi:10.3389/fpsyg.2019.01694
- Normann, N., & Morina, N. (2018). The efficacy of metacognitive therapy: A systematic review and meta-analysis. *Frontiers in Psychology, 9*. doi:10.3389/fpsyg.2018.02211
- Öst, L. G. (2014). The efficacy of acceptance and commitment therapy: An updated systematic review and meta-analysis. *Behaviour Research and Therapy, 61*, 105-121.
- Paris, S. G., & Winograd, P. (1990). How metacognition can promote academic learning and instruction. *Dimensions of Thinking and Cognitive Instruction, 1*, 15-51.
- Ratey, J. J., & Hagerman, E. (2008). *Spark: The revolutionary new science of exercise and the brain*. New York, New York: Little, Brown.
- Reivich, K. & Shatte, A. (2002). *The resilience factor: 7 Essential skills for overcoming life's inevitable obstacles*. New York, NY: Broadway Books.
- Schraw, G. (1998). Promoting general metacognitive awareness. *Instructional Science, 26*(1-2), 113-125.
- Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology, 19*(4), 460-475.
- Schraw, G., & Moshman, D. (1995). Metacognitive theories. *Educational Psychology Review, 7*(4), 351-371.
- Schunk, D. H., & Zimmerman, B. J. (Eds.). (1998). *Self-regulated learning: From teaching to self-reflective practice*. New York, NY: Guilford Press.
- Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. New York, NY: Simon and Schuster.

- Seligman, M. E. P. (2018). *The hope circuit: A psychologist's journey from helplessness to optimism*. New York, NY: PublicAffairs.
- Seligman, M. E. P., Railton, P., Baumeister, R. F., & Sripada, C. (2013). Navigating into the future or driven by the past. *Perspectives on Psychological Science*, 8, 119-141.
- Silvia, P. J., & O'Brien, M. E. (2004). Self-awareness and constructive functioning: Revisiting "The human dilemma". *Journal of Social and Clinical Psychology*, 23(4), 475-489.
- Smalley, S. L. & Winston, D. (2010a). What is mindfulness? In *Fully present: The science, art, and practice of mindfulness* (1, pp. 1-20). Boston, MA: Da Capo Press.
- Smalley, S. L. & Winston, D. (2010b). Getting started. In *Fully present: The science, art, and practice of mindfulness* (1, pp. 21-35). Boston, MA: Da Capo Press.
- Smith, W. P., Compton, W. C., & West, W. B. (1995). Meditation as an adjunct to a happiness enhancement program. *Journal of Clinical Psychology*, 51, 269-273.
- Sokol, L., Beck, A. T., Greenberg, R. L., Wright, F. D., & Berchick, R. J. (1989). Cognitive therapy of panic disorder: A nonpharmacological alternative. *Journal of Nervous and Mental Disease*, 177(12), 711-716. <https://doi.org/10.1097/00005053-198912000-00001>
- Tellegen, A. (1985). *Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report*. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681-706). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ullrich, P. M., & Lutgendorf, S. K. (2002). Journaling about stressful events: Effects of cognitive processing and emotional expression. *Annals of Behavioral Medicine*, 24(3), 244-250.
- Van der Heiden, C., Muris, P., & van der Molen, H. T. (2012). Randomized controlled trial on the effectiveness of metacognitive therapy and intolerance-of-uncertainty therapy for

- generalized anxiety disorder. *Behaviour Research and Therapy*, 50(2), 100-109.  
doi:10.1016/j.brat.2011.12.005
- Veenman, M. V., & Spaans, M. A. (2005). Relation between intellectual and metacognitive skills: Age and task differences. *Learning and Individual Differences*, 15(2), 159-176.  
doi:10.1016/j.lindif.2004.12.001
- Vos, T. et al. (2016). Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: A systematic analysis for the Global Burden of Disease Study 2015. *The Lancet*, 388(10053), 1545-1602.  
[https://doi.org/10.1016/S0140-6736\(16\)31678-6](https://doi.org/10.1016/S0140-6736(16)31678-6)
- Wells, A. (2000). *Emotional disorders and metacognition: Innovative cognitive therapy*. Chichester, UK: Wiley.
- Wells, A. (2009). *Metacognitive therapy for anxiety and depression*. New York, NY: Guilford Press.
- Wells, A. (2019) Breaking the Cybernetic Code: Understanding and Treating the Human Metacognitive Control System to Enhance Mental Health. *Frontiers in Psychology*, 10.  
doi:10.3389/fpsyg.2019.02621
- Wells, A., & Matthews, G. (1994). *Attention and emotion: A clinical perspective*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Wells, A., & Matthews, G. (1996). Modelling cognition in emotional disorder: The S-REF model. *Behaviour Research and Therapy*, 34(11-12), 881-888.  
[https://doi.org/10.1016/S0005-7967\(96\)00050-2](https://doi.org/10.1016/S0005-7967(96)00050-2)
- Wells, A., Welford, M., King, P., Papageorgiou, C., Wisely, J., & Mendel, E. (2010). A pilot randomized trial of metacognitive therapy vs applied relaxation in the treatment of adults

with generalized anxiety disorder. *Behaviour Research and Therapy*, 48(5), 429-434.

doi:10.1016/j.brat.2009.11.013

Whitebread, D., Coltman, P., Pasternak, D. P., Sangster, C., Grau, V., Bingham, S., Almeqdad, Q., & Demetriou, D. (2009). The development of two observational tools for assessing metacognition and self-regulated learning in young children. *Metacognition and Learning*, 4(1), 63-85. <https://doi.org/10.1007/s11409-008-9033-1>

World Health Organization. (2017). *Depression and other common mental disorders*. Retrieved from <https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf;jsessionid=3C066D350D7C8E8630F9F3DF6844E976?sequence=1>

Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18, 459-482.

Zettle, R. D. (2016). The self in acceptance and commitment therapy. In A. Beck & M. Kyrios, R. Moulding, G. Doron, S. Bhar, M. Nedeljkovic, & M. Mikulincer (Eds.), *The Self in Understanding and Treating Psychological Disorders* (pp. 50-58). Cambridge, United Kingdom: Cambridge University Press.