

## **ABSTRACT**

BABIJ, ALEXANDRA DANIELLE. *Mindsets Matter for Mental Health*. (Under the direction of Dr. Jennifer L. Burnette).

‘Mental illness’ is typically defined as a health condition that affects the way a person thinks, feels, and behaves (NAMI, 2017). Ranging in severity from mild to severe, such conditions impair the day-to-day functioning of individuals as well as their ability to relate to others. While mental health was once conceptualized as the absence of mental illness, it is now understood to mean being in a state of emotional, psychological, and social well-being (WHO, 2001). This effectively translates to engaging in activities that are productive and make meaningful contributions to society, maintaining healthy relationships with others, and being able to cope with normal stresses of everyday life, including adapting to change (WHO, 2001). A growing body of research suggests that an individual level factor that can function both as a catalyst for impairing and improving individuals’ mental health are mindsets, or lay beliefs regarding the malleability of certain human attributes, abilities, conditions, and experiences.

The three manuscripts in this dissertation add to this nascent field of research applying the mindset perspective to the mental health context. The first manuscript examines the relationship between beliefs about the meaning of experiencing negative emotions and their relation to coping responses in the wake of a personal setback. The second manuscript explores how mindsets of self-regulation ability influence coping responses to a setback as well as how they relate to indicators of mental illness —namely, attention-deficit hyperactivity disorder (ADHD). The final manuscript examines the relationship between mindsets of mental illness and stigma-related outcomes. Collectively, the findings from this research indicate that the mindset theoretical perspective provides useful insight into both self-regulation and stigma in the context of mental health and, moreover, offers a tenable framework for intervention efforts in this area.

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Mindsets Matter for Mental Health

by  
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## **DEDICATION**

To my mother, my lighthouse. And to my best friend, who never hesitated to weather every storm alongside me.

## **BIOGRAPHY**

Alexandra Danielle Babij was born in Ontario, Oregon. After high school, she attended Willamette University in Salem, Oregon where she first discovered her love of psychology. In 2015, she graduated from the university with a Bachelor of Arts in Psychology. Alexandra then took a position as a research assistant in the Mind & Body Lab at Stanford University before joining the Mindset Lab at North Carolina State University in the Fall of 2016 to pursue her doctoral degree in psychology.

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## CHAPTER 1 | INTRODUCTION

Mental illness and mental health were long thought to be different sides of the same coin - opposite poles on a single continuum. Such thinking implied that individuals with specific, diagnosable mental illnesses such as schizophrenia were located at one end of the continuum, while others without mental illnesses were located at the other. Based on this bipolar conceptualization, 'mental health' was effectively understood to simply be an absence of mental illness. Over time, however, our understanding has evolved and crystallized, revealing that mental illness and mental health are not in fact different sides of the same coin. Rather, they are two different coins, representing two related but distinct dimensions (Keyes, 2005; Westerhof & Keyes, 2010).

Today, mental illness is widely understood to be a health condition that affects the way an individual thinks, feels, and behaves (NIMH, 2017). Such conditions adversely impact an individual's ability to both function in daily life and relate well to others. In addition, mental illness often causes the afflicted individual significant psychological distress. Importantly, it is well known that mental illnesses range in both their severity (from relatively mild to severely debilitating) and chronicity (from single episode to constant occurrence). As such, at different times in their life, any given individual may find themselves at different points along the mental illness continuum (e.g., low mental illness vs. high mental illness).

Mental health, on the other hand, is concerned with the extent to which individuals are in a state of emotional, psychological, and social well-being (WHO, 2001). Those considered to be in good mental health are able to engage in activities that are productive and meaningfully contribute to broader society, maintain positive ongoing relationships with others, cope with normal stresses of everyday life and adapt to change (WHO, 2001). In contrast, those with poor

mental health struggle to do so. It is important to note that mental health status is dynamic – it ranges from good to poor across time points and alongside life events. Critically, this is true for all individuals, including those with mental illness.

Given the role of mental health in shaping important life outcomes (e.g., satisfaction with life, physical health and longevity; Diener & Chan, 2011; Lombardo et al., 2018; Rissanen et al., 2013, Wiest et al., 2011), researchers are invested in identifying factors that serve to promote it as well as those that undermine it. In my programmatic line of research, I examine one particular individual level factor that at once has the capacity to hinder and enhance mental health and well-being – namely, mindsets.

### **Mindsets**

Mindsets, also known as implicit theories, are individuals' commonsense beliefs regarding the nature (i.e., malleability and/or utility) of different attributes, abilities, conditions, and experiences (Dweck, 2000; Dweck & Leggett, 1988; Molden & Dweck, 2006). Within this framework, the belief that attributes, abilities, and conditions are relatively static and immutable as well as the belief that difficult experiences (e.g., stress; Crum et al., 2013) are debilitating is referred to as a fixed mindset (or entity theory). In contrast, the belief that attributes, abilities, and conditions are changeable as well as the belief that challenging experiences are enhancing is referred to as a growth mindset (or incremental theory). It is important to note that these beliefs fall along a continuum from fixed-oriented to growth-oriented. Additionally, they are domain and context specific, meaning that individuals can hold a stronger growth-oriented mindset in one domain (e.g., intelligence) while also holding a more fixed-oriented mindset in another (e.g., musical ability).

Of greatest relevance to the current body of work, is that across a variety of domains, a wealth of research indicates that individuals' mindsets matter for mental health. Specifically, mindsets have been demonstrated to inform coping responses as well as processes related to person perception in important ways.

### **Mindsets and Coping**

It is well established that mindsets inform individuals' cognitive and behavioral responses to challenges (see Burnette et al., 2013 for review). Specifically, in the wake of encountering a personal setback in a given domain, individuals who endorse a growth mindset tend to remain optimistic about their potential for future success. In other words, they maintain their sense of self-efficacy. For example, individuals with stronger growth mindsets of self-regulation ability reported feeling more confident in their ability to achieve a personal goal they previously failed to achieve compared to their more fixed mindset counterparts (Burnette et al., 2020a). In terms of behavior, individuals endorsing a growth mindset tend engage in more mastery or approach-oriented behavioral strategies when confronted with setbacks (e.g., putting in extra practice time; Cury et al., 2008). That is, they redouble their efforts in the face of challenges. Generally speaking, these cognitive and behavioral coping responses (i.e., optimism and engagement) are adaptive in most situations and beneficial for overall mental health.

In addition to cognitive and behavioral responses, mindsets also inform affective responses in crucial ways. Specifically, when faced with a personal setback or failure to achieve a goal, individuals endorsing a growth mindset are less likely to report experiencing severe decreases in their sense of self-esteem and self-worth as well as fewer and less severe negative emotions (e.g., sadness, anxiousness) in the context of that setback than their fixed mindset counterparts (Babij et al., 2019; Burnette et al., 2020a; Cury et al., 2008; Niiya et al., 2004; Plaks

& Stecher, 2007; Robins & Pals, 2002). For example, in a within-subjects study by Niiya et al. (2004), when primed with a growth mindset, participants reported higher state self-esteem and less negative affect (i.e., feelings of anxiety, depression, and hostility) upon receiving failure feedback on a practice GRE test compared to when they were primed with a fixed mindset. A growing body of evidence suggests that mindset type may be linked to such outcomes via informing which emotion-regulation strategies individuals choose to adopt. Findings of several studies indicate that endorsing a growth mindset is associated with the selection of more adaptive emotion-regulation strategies such as cognitive reappraisal (De Castella et al., 2013; Ford et al., 2018; Kneeland & Dovidio, 2020; Kneeland et al., 2016a, 2016b; Kneeland et al., 2019; Tamir et al., 2007).

Furthermore, it is important to note that even in the absence of an immediate threat or personal setback, there is a direct link between mindset type and mental health-related outcomes (Calvete et al., 2019; Miu & Yeager, 2015; Schleider, 2015; Schleider & Weisz, 2016, 2018; Yeager et al., 2014). This link is likely driven by cognitive, behavioral, and affective coping patterns. For example, in a recent large-scale meta-analysis, stronger growth mindsets were positively correlated with valuing treatment ( $r = .137$ ) and more engaging in approach-oriented behavioral strategies ( $r = .207$ ) and were negatively related to experiencing psychological distress (i.e., symptoms of anxiety, depression, and stress;  $r = -.220$ , Burnette et al., 2020b).

### **Mindsets and Person Perception**

Beyond informing coping responses, several lines of mindset-related research demonstrate how individuals' beliefs affect their judgments about others. For example, mindsets regarding personality and morality (i.e., beliefs that people's personalities as well as their moral integrity are malleable) have long been identified as intimately shaping the process of person

perception. More specifically, endorsing a growth mindset is associated with greater likelihood of making process-focused, rather than trait-focused judgements about others (Chiu et al. 1997; Dweck et al., 1995; Molden & Dweck, 2006). Importantly, these judgments are linked to stereotyping; individuals who endorse a fixed mindset of personality and are thus apt to make trait-focused judgments tend to endorse stereotypes more strongly and apply them more quickly than their growth mindset counterparts (Chiu et al. 1997; Dweck et al., 1995; Dweck & Leggett, 1998; Gervy et al., 1999; Levy & Dweck, 1999; Levy et al., 1998, 2001; Molden & Dweck, 2006). Stereotyping itself, in turn, often serves as a precursor to harmful prejudicial attitudes and discriminatory behaviors known to negatively impact mental health and well-being (Dovidio et al., 1996).

Such findings seem to indicate that holding growth-oriented beliefs may help reduce stigma. However, some more recent work in domains other than personality and morality suggests otherwise. For example, one recent study examining mindsets of emotion-regulation ability found that individuals who endorsed a stronger growth mindset of emotion regulation ability (i.e., believing that people can change and control their emotions) exhibited more negative cognitive, affective, and behavioral responses (i.e., blame, annoyance, and avoidance) and fewer positive responses (perspective taking, empathic concern, and support) towards a hypothetical individual experiencing depression (Smith, 2019). Further, those with stronger growth mindsets were also more likely to encourage the hypothetical individual to suppress expression of their emotion (a maladaptive emotion regulation strategy) as opposed to engage in cognitive reappraisal (an adaptive strategy; Smith, 2019).

In addition, the findings of several studies examining the relationship between weight-related mindsets and various indicators of stigma (e.g., anti-fat attitudes) provide further

evidence that there may be important costs associated with growth-oriented beliefs. Specifically, a series of studies demonstrated that at the same time that endorsing a growth mindset of weight fosters a decrease in prejudice against individuals with obesity via reducing essentialist thinking (i.e., viewing individuals with obesity as having an underlying, inherent essence), it also *increases* prejudice against these individuals by increasing attributions of blame for their condition (Burnette et al., 2017; Hoyt et al., 2017; 2019). Researchers have since dubbed the finding that growth mindsets can at once serve to diminish and improve outcomes as the ‘double-edged sword effect’ (Hoyt & Burnette, 2020). While researchers continue to try to reconcile these findings and uncover the nuances underlying the relationship between mindsets and person perception, one thing is clear: for better or worse, mindsets impact our judgments.

### **Overview of Research Chapters**

The work presented here adds to our understanding of how our mindsets, our beliefs about the nature of attributes, abilities, conditions, and experiences matter for mental health by affecting processes related to coping and person perception. Across the three related manuscripts in this dissertation, I investigate 1) the relationship between beliefs about the utility of experiencing negative emotion and coping responses to a personal setback (Babij et al., 2019), 2) how mindsets of self-regulation ability are related to coping with a setback as well as indicators of mental illness – namely, ADHD (Burnette et al., 2020a), and 3) how people’s beliefs about mental illness inform their attitudes towards individuals with mental illness.

## CHAPTER 2 | MANUSCRIPT 1

### **Failing and Feeling Bad: How We Think About Experiencing Negative Emotions During Setbacks**

Have you ever done poorly on a test you wanted to ace? Have you ever eaten a giant piece of chocolate cake while dieting? More generally, have you ever encountered a setback in pursuit of a personal goal? If you are like most people, the answer to this last question is yes. And in such instances, you subsequently had to decide between continuing to persist towards your goal or quitting. One social-cognitive perspective commonly used to help predict this decision is that of implicit theories (Dweck & Leggett, 1988; Molden & Dweck, 2006). However, we suggest that this perspective has not fully considered the role of appraisals of emotion in this decision-making. As part of self-regulation, individuals inevitably experience negative emotions such as guilt and embarrassment when they encounter setbacks (Carver, 2004; Carver & Scheier, 1990; Carver & Scheier, 2012; Tracy & Robins, 2004). In the current research, we examine the meaning people assign to experiencing these negative emotions in the context of setbacks and examine how these meaning systems inform self-regulatory responses.

#### **Implicit Theories and Self-Regulation Links**

Implicit theories, or mindsets, are lay beliefs about the malleability of different human attributes such as intelligence (Dweck, 2000; Dweck & Leggett, 1988) and shyness (Valentiner, Mounts, Durik, & Gier-Lonsway, 2011). Within this framework, a belief that attributes are relatively static and immutable is referred to as an entity theory (or fixed mindset) whereas a belief that attributes are amenable to change is referred to as an incremental theory (or growth mindset) (Dweck, 2000). It is important to note that these implicit theories are domain specific –

meaning that an individual can have incremental theory about one attribute (e.g., intelligence) and an entity theory about another (e.g., athletic ability).

Across several studies, implicit theories are linked to self-regulation (Molden & Dweck, 2006; see Burnette et al., 2013 for meta-analysis). For example, implicit theories predict differences in the behavioral strategies that individuals employ to reach their goals after encountering obstacles. When confronted with challenges, individuals holding entity theories tend to adopt helpless-oriented behavioral strategies such as avoidance and self-handicapping (e.g., Shih, 2009). For these individuals, adopting these helpless-oriented strategies largely functions as a means of protecting self-esteem (Molden & Dweck, 2006; Nussbaum & Dweck, 2008). In contrast, when incremental theorists are faced with setbacks, they tend to adopt more mastery-oriented behavioral strategies such as putting in extra practice time (e.g., Cury, Da Fonseca, Zahn, & Elliot, 2008). For these individuals, adopting mastery-oriented strategies largely functions as a means of self-improvement. In light of these links, the implicit theory framework is consistently used to predict who will persist and who will quit after a setback.

Importantly, this decision to persist or quit does not occur in an emotional vacuum. That is, as part of the self-regulatory process, individuals inevitably experience basic emotions such as sadness and anxiety as well as self-conscious emotions such as guilt and embarrassment when they encounter a setback (Carver 2004; Carver & Scheier, 1990; Carver & Scheier, 2012; Tracy & Robins, 2004). It is easy to imagine that as they arise, people *think about*, or *appraise*, these negative emotions in important ways. However, in the context of emotions, implicit theory research has primarily focused on identifying differences in the emotional severity experienced by individuals as a function of implicit theory. That is, it has focused on determining whether entity or incremental theorists experience more severe negative emotions in the wake of a

setback (i.e., whether incremental or entity theorists ‘feel worse’). Below, we briefly review the literature linking implicit theories to differences in emotional severity, parsing it into three subcategories (i.e., implicit theories of attributes, emotion, and psychopathology; Howell, 2017).

## **Implicit Theories and Severity of Emotions**

### ***Implicit Theories of Attributes***

The first subcategory, which includes the earliest work in the field, concerns implicit theories of general personal or social attributes such as intelligence (Howell, 2017). Initially, the work within this category primarily assessed ‘feeling worse’ in terms of differences in such psychological constructs as self-esteem and self-worth (Dweck, 2000; Niiya, Crocker, & Bartmess, 2004; Robins & Pals, 2002). Across several studies, most of which examined implicit theories of intelligence, findings indicated that entity theorists tended to exhibit more severe decreases in self-esteem and self-worth upon encountering a setback (e.g., receiving failure feedback on a practice GRE test; Niiya, Crocker, & Bartmess, 2004) compared to their incremental theorist counterparts (Dweck, 2000; Niiya, Crocker, & Bartmess, 2004; Robins & Pals, 2002). Later, subsequent work began to focus on understanding how implicit theories of a given personal or social attribute differentially influenced the severity of specific state emotions like anxiety and worry (Cury, et al., 2008; Plaks & Stetcher, 2007). The findings of these studies indicated that individuals holding either naturally occurring or experimentally induced entity theories experienced more severe negative emotions (i.e., anxiety, worry) providing additional support for the notion that there are differences in emotional severity based on implicit theories of attributes.

### ***Implicit Theories of Emotion***

As the field continued to develop, the scope of research broadened from implicit theories of personal and social attributes (i.e., traits, qualities, abilities) to include implicit theories about emotion. Within this context, individuals can hold entity or incremental beliefs about the changeability and controllability of emotion (Tamir, John, Srivastava, & Gross (2007). Individuals holding an incremental theory of emotion tend to believe that people can generally both control and change the emotions that they experience. In contrast, individuals holding an entity theory tend to believe that people cannot control or change their emotions. Although the majority of studies investigating implicit theories of emotion focused on the long-term impact of these implicit theories on various mental health outcomes such as anxiety and depression (Kneeland et al., 2016a; Kneeland et al., 2016b; Ford et al., 2018; see Howell, 2017 for review), a few examined shorter-term impacts, including differences in the severity of negative emotions (Kappes & Schikowski, 2013; Tamir et al. 2007). For example, in one study, after having their implicit theories of emotion and baseline negative affect assessed, participants reported on the extent to which they felt uncomfortable while watching an aversive movie clip as well as how much negative emotion they experienced after it ended (Kappes & Schikowski, 2013). Not surprisingly, findings indicated that individuals who held entity beliefs of emotion controllability and changeability reported experiencing greater discomfort during and more severe negative emotion after viewing the clip (Kappes & Schikowski, 2013).

### ***Implicit Theories of Psychopathology***

With the work on implicit theories of emotion consistently linking beliefs about the controllability and changeability of emotion in general to various mental health outcomes, researchers began to explore implicit theories of psychopathology. Implicit theories of

psychopathology are concerned with the malleability of psychological conditions or their symptoms (i.e., general anxiety, shyness, and social anxiety; Howell, 2017). That is, beliefs about whether dispositional personality characteristics, or what are commonly referred to as trait emotions, are amenable to change. Implicit theories of psychopathology are linked to important mental health-related outcomes such as coping ability, treatment preference and immediate symptom severity. For example, across a series of studies investigating implicit theories of anxiety, individuals who endorsed an entity theory of anxiety reported stronger feelings of worry, anxiety, and depression in the immediate present (Schroder, Dawood, Yalch, Donnellan, & Moser, 2015; Schroder et al., 2017). Additionally, work on social anxiety demonstrated a similar pattern. Individuals diagnosed with Social Anxiety Disorder who held an entity theory reported experiencing greater negative affect than both their incremental counterparts and a non-clinical population (De Castella et al., 2014).

In sum, work across all three subcategories of implicit theories examined differences in the severity of negative emotions experienced in the wake of a setback.<sup>1</sup> Together, the research firmly established that implicit theories can help us predict ‘who feels worse’. The answer unequivocally seems to be those who hold entity theories. However, there is an important area for extension— namely, understanding how individuals are appraising the negative emotions that they are experiencing. That is, how do people think about this experience of ‘feeling bad’? When people experience the onset of self-conscious emotions like guilt and embarrassment when they encounter a setback to achieving a goal, what do they believe it means? In order to explore these

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<sup>1</sup> We note that, to our knowledge, no work within the latter two categories has explored the impact of their respective implicit theories on the severity of negative emotion experienced specifically in the context of encountering a setback in the same way that ‘setback’ is typically conceptualized in the work on general personal and social attributes (e.g., failing to solve a problem on an IQ test). However, we suggest that a ‘setback’ in these two contexts may reasonably be understood as having an unpleasant or unwelcome experience (e.g., experiencing unanticipated distress while watching a film clip).

appraisals of negative emotions and their impact, we draw on a framework used in a recent study regarding appraisals of another transient experience - stress-induced arousal (Crum, Salovey, & Achor, 2013).

### **Stress-induced Arousal Appraisals and Self-Regulation Links**

Stress-induced arousal is a pattern of cognitive, affective, and physiological responses that arise when a stressor or threat is anticipated or encountered (Carver & Connor-Smith, 2010; Sapolsky, 1996). Crum et al. (2013) suggested that individuals think about experiencing stress-induced arousal as being either helpful or harmful. More specifically, they posited that when experiencing stress-induced arousal, individuals perceive this state as being either fundamentally enhancing or debilitating in terms of their learning/growth, health/vitality, and productivity/performance. For example, in terms of learning, some individuals believe that the narrowing of their attention produced as part of the stress response improves their mental acuity and thus their ability to complete the task at hand. Conversely, others think about that same aspect of the stress response as a hindrance – creating ‘tunnel vision’ that significantly interferes with multi-tasking. These different beliefs are referred to as stress-as-enhancing and stress-as-debilitating *mindsets*, respectively, by the researchers (Crum et al., 2013). However, we suggest referring to them as stress-induced arousal *appraisals* (e.g., stress-as-enhancing appraisal and stress-as-debilitating appraisal) in order to avoid muddying the term mindset which is often used interchangeably with implicit theories to exclusively refer to beliefs about the malleability of human attributes and abilities (e.g., intelligence, fitness). Here, the beliefs capture the meaning assigned to experiencing a transient state.

A link similar to the one that exists between self-regulatory processes and implicit theories, also exists between self-regulatory processes and stress-induced arousal appraisals.

More specifically, appraisal type is associated with behavioral strategies as well as the severity of emotion that arises as part of goal monitoring. For example, prior to completing a stress-inducing task, individuals who made stress-as-enhancing appraisals were significantly more likely to choose to receive professional feedback on their performance than their stress-as-debilitating counterparts (Crum et al., 2013). This finding demonstrates a difference in behavioral strategies as a function of stress-induced arousal appraisal. That is, opting to receive feedback represents a more mastery-oriented behavioral response, whereas choosing not receive feedback represents a helpless-oriented response. In addition, those making stress-as-enhancing, relative to debilitating, appraisals reported perceiving the task to be significantly less stressful (Crum et al., 2013). This finding suggests a difference in emotional experience based on stress-induced arousal appraisal. That is, those who appraise stress-induced arousal as enhancing have less severe emotional experiences.

### **Current Work: Negative Emotion Appraisals and Self-Regulation Links**

Guided by Crum et al.'s (2013) framework, we propose that people may make appraisals along the same dimensions regarding the negative emotions they experience when they encounter setbacks to achieving a personal goal. That is, they may make *negative-emotion-as-enhancing* or *negative-emotion-as-debilitating* appraisals.

From a psychological perspective, it is clear that experiencing negative emotions in the context of goal pursuit is an adaptive part of self-regulation. That is, as an integral part of the goal monitoring process, these negative emotions function as objective signals indicating the degree to which our behavioral strategies have been successful in producing our desired rate of progress (Carver 2004; Carver & Scheier, 1982; Carver & Scheier, 1990; Carver & Scheier, 2012). We suspect that those who tend to make negative-emotion-as-enhancing appraisals

perceive experiencing negative emotions in a way that is consistent with this perspective, albeit in more general terms. More specifically, we believe that they perceive experiencing the negative emotions that arise in the face of setbacks as a valuable source of motivation. That is, the initial disappointment and shame ultimately inspire a dogged determination to pursue their goal with renewed vigor. We posit that this perception of negative emotions as motivating, and thereby enhancing, may stem from interpreting the emotions as a signal of success/failure. That is, the negative emotions simply alert an individual that they were unsuccessful in reaching their goal.

In contrast, we suspect that individuals who make negative-emotion-as-debilitating appraisals may interpret those same negative emotions as a signal about ability – or lack thereof. That is, the negative emotions are interpreted not only as indicating that an individual *did not* reach their goal, but more importantly that they *cannot* reach their goal because of an underlying lack of ability. This interpretation of emotion as indicative of fundamental inability, may result in experiencing even more severe negative emotions because it poses a threat to self-identity. We suggest that the overpowering sense of feeling bad functions as a catalyst for withdrawal and promotes the perception of negative emotions as ultimately incapacitating.

Based on these suppositions and building off previous work suggesting that appraisals of stress-induced arousal as enhancing or debilitating are grounded in beliefs regarding its impact on learning/personal growth, physical health/vitality, and productivity/performance (Crum et al., 2013), we suggest that individuals' negative emotion appraisals are shaped by their beliefs about whether experiencing negative emotion facilitates or inhibits their potential for learning and personal growth as well as their motivation and ability to reach goals.

In the current research, we explore how negative emotion appraisals may be linked to self-regulatory processes. More specifically, we examine how they inform the severity of

emotional experiences and influence the selection of behavioral strategies following a setback. We hypothesize that individuals who make negative-emotion-as-enhancing appraisals will both report experiencing less severe negative emotions and engage in more mastery-oriented behavioral strategies. We test these hypotheses across two studies. Using a correlational design, in Study 1, we examine the links between negative emotion appraisals, severity of negative emotion, and behavioral strategies with participants reporting a time they encountered a setback while striving to reach a personal goal. And, we explore if these effects hold above and beyond typically assessed implicit theories—namely those related to intelligence, personality, and emotion. In Study 2, we experimentally manipulate negative emotion appraisals to test causal relations between appraisals, severity of emotion, and behavioral strategies.

### **Study 1 Methods**

#### **Participants**

We recruited three hundred and two participants using Amazon’s Mechanical Turk - MTurk (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). They received \$0.50 for their participation in the online survey that we advertised as an examination of responses to setbacks. We excluded participants ( $n= 19$ ) who completed the study in an unreasonably short span of time (i.e., less than 2 minutes) and/or failed embedded attention checks (e.g., “Select ‘Somewhat untrue of me’ for this statement”).<sup>2</sup> This left  $N= 283$  participants (77% white, 67% female, aged 19 to 80 years ( $M = 38.24$ ,  $SD = 12.65$ )) for final analyses. Informed consent was obtained from all individual participants included in the study.

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<sup>2</sup> Participants typically took between 8 and 11 minutes to complete the survey ( $M = 642.20$  seconds,  $Mdn = 530.00$  seconds).

## Procedure

Participants first completed a measure assessing the way that they typically appraise negative emotions. Next, they completed a writing exercise in which they described a time they had failed to achieve a personal goal and rated the severity of the negative emotions they experienced as result of that failure. In one sentence, participants described facing setbacks in a variety of domains including those related to health (e.g., “not losing 5 pounds”, failing to “exercise more regularly”, being “unable to quit smoking”), finances (e.g., “being unable to save money for emergencies”), and work/academics (e.g., “failing a Spanish class”, “not getting the job”). Immediately following this, participants completed a questionnaire assessing their behavioral response to the failure and subsequent experience of negative emotions. Finally, they completed three randomized implicit theory measures in order to test if effects held controlling for these beliefs. The institutional review board approved all procedures.

## Measures

Participants responded to all of the following measures on a 7-point Likert scale ranging from 1(*Strongly disagree*) to 7(*Strongly agree*).

### *Negative Emotion Appraisals*

We assessed participants’ beliefs about the meaning of experiencing negative emotions by adapting the measure created by Crum et al. (2013) to assess stress-induced arousal appraisals. Our measure includes 8 items with 5 items depicting negative emotions as debilitating (e.g., “Experiencing negative emotion depletes my motivation”) and 3 items depicting negative emotions as enhancing (e.g., “Experiencing negative emotion enhances my ability to reach my goal”). See Appendix A for all items. We recoded such that higher scores reflect a stronger negative-emotion-as-enhancing appraisal ( $\alpha = .86$ ). The mean score of all items combined

ranged from a low of 1.25 to a high of 6.88, with an average score of 3.88 ( $SD = 1.14$ ) across the sample.

### ***Severity of Negative Emotions Recalled***

To assess the severity of the negative emotions participants experienced after failing to achieve their goal, they rated the extent to which they felt 5 different negative emotions (e.g., “I felt embarrassed”). We included 2 basic negative emotions (i.e., anger and sadness) as well as 3 self-conscious emotions (i.e., guilt, shame, and embarrassment). We recoded such that higher scores reflect experiencing more severe negative emotions ( $\alpha = .85$ ).

### ***Performance Regulatory Strategies***

We created a 6-item measure to assess participants’ behavioral response to their self-reported failure and subsequent experience of negative emotions, by adapting items from Ommundsen’s (2003) self-regulation strategies measure and Burnette’s (2010) avoidant coping measure. This measure included 3 items depicting mastery-oriented behavioral strategies (e.g., “I exerted more effort to achieve my goal”) and 3 items depicting helpless-oriented behavioral strategies (e.g., “I gave up on my goal altogether”). We recoded such that higher scores reflect more mastery-oriented behavioral strategies ( $\alpha = .74$ ).

### ***Covariate Measures***

To examine effects of negative emotion appraisals above and beyond typically assessed implicit theories, we included the following measures for use as covariates.

### ***Implicit Theories of Intelligence***

We assessed participants’ beliefs about the malleability of intelligence by administering the implicit theories of intelligence measure (Dweck, Chiu, & Hong, 1995) which included 4 entity theory-oriented items (e.g., “You have a certain amount of intelligence, and you can’t

really do much to change it”). We recoded such that higher scores reflect a stronger incremental theory of intelligence ( $\alpha = .97$ ).

### ***Implicit Theories of Emotion***

We assessed beliefs about emotion changeability and control in the current study using the 4 item implicit theories of emotion measure (Tamir et al., 2007) which included 4 entity theory-oriented items (e.g., “If they want to, people can change the emotions that they have”, “The truth is, people have very little control over their emotions”). We recoded such that higher scores reflect a stronger incremental theory of emotion changeability and control ( $\alpha = .88$ ).

### ***Implicit Person Theories***

We assessed participants’ beliefs about the malleability of personality using the implicit person theories measure (Chiu, Hong, & Dweck, 1997) which included 3 fixed-mindset worded items (e.g., “The kind of person someone is, is something very basic about them, and can’t be changed very much”). We recoded such that higher scores reflect a stronger incremental theory of personality ( $\alpha = .96$ ).

## **Study 1 Results**

We created composite mean scores for all measurement scales. Listwise deletion was used to handle missing data. See Table 1 for means, standard deviations, range, Chronbach’s alpha scores, and correlations between the scales.

In support of our first hypothesis, a linear regression indicated that negative-emotion-as-enhancing, relative to debilitating, appraisals predicted less severe negative emotions after a setback ( $\beta = -.24$ ,  $t = -4.22$ ,  $p < .001$ ; 95% CI  $-.40$ ,  $-.15$ ). Additionally, this result held ( $\beta = -.22$ ,  $t =$

-3.72,  $p < .001$ ; 95% CI -.37, -.12) when implicit theories (i.e., intelligence, emotion, and person) were added to the model (see Table 2).<sup>3</sup>

In support of hypothesis 2, a linear regression revealed that stronger negative-emotion-as-enhancing appraisals predicted reports of mastery-oriented performance regulatory strategies ( $\beta = .24$ ,  $t = 4.11$ ,  $p < .001$ ; 95% CI .13, .36). Furthermore, negative emotion appraisal was the only significant predictor of performance regulatory strategies ( $\beta = .22$ ,  $t = 3.63$ ,  $p < .001$ ; 95% CI .10, .34) when implicit theories (i.e., intelligence, emotion, and person) were added to the model (see Table 2).

### Study 1 Discussion

Study 1 provided initial support for the idea that the meaning assigned to the negative emotions that arise in the face of setbacks matters in two distinct ways. First, our results indicate that individuals who make negative-emotion-as-enhancing appraisals tend to self-report experiencing less severe negative emotions in the face of setbacks. This effect is similar in magnitude ( $r = -.24$ ) to that found in the meta-analysis linking implicit theories to negative emotions ( $r = -.23$ , Burnette et al., 2013). Second, and also consistent with past literature regarding the adoption of different behavioral strategies as a function of implicit theories (Dweck, 2000), our results suggest that individuals making negative-emotion-as-enhancing, relative to debilitating, appraisals tend to engage in more mastery-oriented behavioral strategies after encountering setbacks.

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<sup>3</sup> It is interesting to note that results of this model indicated that stronger incremental theories of intelligence predicted more severe negative emotions,  $\beta = .19$ ,  $t = 2.65$ ,  $p = .009$ . This finding is unexpected. As discussed in the introduction, incremental theories of general social and personal attributes like intelligence tend to predict less severe negative emotion. Indeed, a large meta-analysis ( $N = 28,217$ ), revealed this specific relation ( $n = 1,515$ ) to be  $r = -.23$  (Burnette et al., 2013). Considering the convincing sample size of the meta-analysis and evidence to the contrary of what we find here, we are hesitant to speculate further.

Although these results supported our hypotheses and held even when controlling for commonly assessed implicit theories, Study 1 had three notable limitations. First, the study used retrospective accounts of failure and subsequent emotions. This assumes participants can accurately remember and report the goal, the failure, and the subsequent emotions. We suspect that such retrospection may not have elicited as strong of cognitive and affective responses. Second, no causal conclusions could be drawn. Third, this study was exploratory and a confirmatory preregistered study could strengthen confidence in findings. To address these issues, in Study 2, we directly manipulated negative emotion appraisals and provided failure feedback on a laboratory-controlled task to induce negative emotions. In addition, we added positive emotions to see if there is less of an impact on these in the wake of a setback and we assessed behavioral responses (both self-report and actual behavior). Furthermore, we, preregistered procedures, predictions, and analyses (<https://osf.io/ef23b>).<sup>4</sup>

## **Study 2 Methods**

### **Hypotheses**

H1: Participants in the negative-emotion-as-enhancing condition, relative to the negative-emotion-as-debilitating condition, will report stronger negative-emotion-as-enhancing, relative to negative-emotion-as-debilitating, appraisals.

H2: Those who are in the negative-emotion-as-enhancing condition will report more positive emotions after receiving failure feedback, relative to those in the negative-emotion-as-debilitating condition.

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<sup>4</sup> The above link will direct the reader to the original OSF pre-registration form. Please note that we submitted an amendment to this pre-registration for the purpose of correcting a typo in regard to a planned analysis. To view the amendment, please click here: <https://osf.io/x3bqn>.

H3: Those who are in the negative-emotion-as-debilitating condition will report more negative emotions after receiving failure feedback, relative to those in the negative-emotion-as-enhancing condition.<sup>5</sup>

H4: Participants in the negative-emotion-as-enhancing, relative to the negative-emotion-as-debilitating condition, will report more mastery-oriented behavioral strategies (i.e., stronger intentions to put in more effort on a future task; greater interest in making an upward comparison, greater desire to try the task again, and more interest in practice time).

### **Participants**

We recruited 152 undergraduate students enrolled at a large southeastern university to participate in the study.<sup>6</sup> Participants were compensated with either extra credit or course credit as applicable. Prior to analysis, 10 participants were excluded for either indicating high suspicion about the nature of the study or failing embedded attention checks. Additionally, 1 participant requested to have their data excluded. Of the remaining sample used for all final analyses ( $N = 141$ ), 75% of participants identified as white, 14% identified as Black/African American, and 11% identified as Asian/Asian American, respectively. Participants ranged in age from 18 to 31 years ( $M = 19.73$   $SD = 2.05$ ) and about half were female (52%). Informed consent was obtained from all individual participants included in the study.

### **Procedure**

The evening before the scheduled study session, participants received an email informing them that the study would involve a group task and that they had been randomly assigned to be the leader of the group.

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<sup>5</sup> In our OSF preregistration, both hypotheses 2 and 3 are framed as research questions. They were meant to be directional to match Study 1 findings.

<sup>6</sup> We did not reach our target sample size ( $N=220$ ) as outlined in our OSF preregistration due to time constraints. That is, the spring semester ended and we no longer had access to the participant pool.

After arriving at the lab individually, the participant was informed that prior to beginning the leadership study, they needed to evaluate materials being used to teach 9<sup>th</sup> graders about emotion as part of an unrelated study. In actuality, these materials – a short news article and brief video - served as the experimental manipulation.<sup>7</sup> Participants were randomly assigned to the negative-emotion-as-enhancing or negative-emotion-as-debilitating condition. The order in which materials were presented was held constant across conditions.

The news articles were written as *Psychology Today*-type articles that presented evidence indicating that experiencing negative emotions was either enhancing or debilitating. More specifically, participants were introduced to a fictional psychologist named Dr. Josephson who used a pop culture example to explain how negative emotions were either beneficial or detrimental. In “The Good in Negative Emotions” article (negative-emotion-as-enhancing condition), Dr. Josephson explained how negative emotions fueled legendary basketball player Michael Jordan’s success. The takeaway message in this article was “Ultimately, these negative emotions motivate us to redouble our efforts and take actions that move us towards accomplishing our goals.” In contrast, in “The Bad in Negative Emotions” article (negative-emotion-as-debilitating condition), Dr. Josephson explained how negative emotions fueled the downfall of fictional basketball player Kevin Murphy. The takeaway message in this article was “These negative emotions have the capacity to thoroughly obstruct our personal growth by diminishing our motivation and reducing the amount of effort we put into the pursuit of our goal.” Comprehension difficulty and length of the articles were matched across conditions.

The videos presented additional evidence to support the view of emotion as either enhancing or debilitating. More specifically, in the negative-emotion-as-enhancing condition, the

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<sup>7</sup> All manipulation materials (i.e., copies of articles and transcriptions of videos) are available for review here: <https://osf.io/ef23b>. Videos themselves are available from the first author upon request.

video explained how negative emotions arise during the goal monitoring stage of self-regulation for the dual-purpose of helping us recognize that we are not meeting our goal and encouraging us to change whatever behavioral strategy we are currently employing. The takeaway message for this video was “These negative emotions are evolutionarily designed to motivate us to change our behavior in a productive way!” In contrast, in the negative-emotion-as-debilitating condition, the video explained that negative emotions arise during the goal monitoring stage of self-regulation for the dual-purpose of signaling that we are failing to achieve our goal and discouraging us from further goal pursuit because our failure is likely due to a lack of fundamental ability. The takeaway message for this video was “These negative emotions diminish whatever remaining motivation we have to pursue our goal.” Both videos were matched in length (approximately two-and-a-half-minutes) and were animated using Powtoon software.

After evaluating the manipulation materials, participants then began the leadership portion of the study using a modified version of a task used in previous research (Hoyt, Burnette, & Innella, 2012). Participants were told that they would play the role of a hypothetical recruitment manager and they were to brief their ostensible “followers” on how to complete a task involving the selection and screening of potential employees. Participants were provided with a Leader Information Packet (see Appendix B) that included a detailed description of the background, values, and goals of the organization as well as a comprehensive background of their leadership role. They were given eight and a half minutes to prepare for the leadership task. During the leadership task, participants stood behind a podium and were informed that the instructions they provided would be broadcast to their two followers who were participating online via the iPad set up in front of them. The iPad was connected to a monitor on the wall to

show participants what their followers would allegedly be seeing. They were given three minutes to give their instructions.

After giving their instructions, participants were asked to complete a questionnaire including filler and exploratory measures while they waited for their followers to complete their portion of the task and receive feedback. When 10 minutes had passed, the experimenter informed the participant she had received the notification the feedback was ready and printed a hard copy for the participant. The participant was then given one minute to look over the feedback that detailed both how their followers had performed on the task as well as how their followers rated the instructions provided by the participant. All participants received the same negative feedback informing them that both they and their followers had performed in the 63<sup>rd</sup> percentile and 61<sup>st</sup> percentile, respectively (see Appendix C). Once the participant had reviewed the feedback, the experimenter instructed them to complete the outcome measures. All participants then completed a funnel suspicion check and demographic survey before being fully debriefed about the true nature of the study. All procedures were approved by the institutional review board.

## **Measures**

Responses to all of the following measures were made using a 7-point Likert scale ranging from 1(*Strongly disagree*) to 7(*Strongly agree*) unless otherwise specified.

### **Manipulation Check**

#### ***Negative Emotion Appraisals***

We used the same assessment from Study 1 ( $\alpha = .84$ ).

## **Filler Measures**

### ***Personality***

We administered the 44-item Big Five Inventory (John, Donahue, & Kentle, 1991). This measure includes five subscales relating to each of the Big Five personality traits (i.e., openness to experience, conscientiousness, extraversion, agreeableness, neuroticism). Responses to this measure were made using a 5-point Likert scale ranging from 1(*Strongly disagree*) to 5(*Strongly agree*). (openness  $\alpha = .74$ , conscientiousness  $\alpha = .79$ , extraversion  $\alpha = .91$ , agreeableness  $\alpha = .78$ , neuroticism  $\alpha = .80$ )

### ***Self-Control***

We administered the 13-item Brief Self-Control Scale (e.g., “I am good at resisting temptation”; Tangney, Baumeister & Boone, 2004). Responses to this measure were made using a 7-point Likert scale ranging from 1(*Very untrue of me*) to 7(*Very true of me*) ( $\alpha = .80$ ).

### ***Self-Esteem***

We administered the 10-item Rosenberg Self-Esteem Scale (e.g., “On the whole, I am satisfied with myself”; Rosenberg, 1979;  $\alpha = .85$ )

### ***Pre-Feedback Positive and Negative Emotions***

To assess participants’ emotional state prior to receiving failure feedback regarding their performance on the leadership task, we asked them to rate the extent to which they experienced three positive emotions (proud, inspired, and determined;  $\alpha = .85$ ) and three negative emotions (embarrassed, ashamed, guilty;  $\alpha = .81$ ).

### ***Leadership Self-Efficacy***

To assess participants' leadership self-efficacy, we administered the 8-item Self-efficacy for Leadership measure (e.g., "In general, I am very good at leading a group of my peers"; Murphy, 1992;  $\alpha = .90$ ).

### ***Self-Relevance***

To gauge whether or not the participants perceived the leadership task to be important and thus likely invested in the feedback, we used 2 items: "I cared about performing well on this task" and "It was important to me to give good instructions" ( $\alpha = .89$ ).

### **Outcome Measures**

#### ***Post-feedback Positive and Negative Emotion.***

After receiving failure feedback, participants rated the extent to which they experienced three positive emotions (proud, inspired, and determined;  $\alpha = .84$ ) and three negative emotions (embarrassed, ashamed, guilty;  $\alpha = .83$ ).

#### ***Performance Regulatory Strategies***

We modified the performance regulatory strategies measure we used in Study 1 to assess participants' future behavioral intentions (i.e., how likely they would be to engage in certain behaviors if they completed a similar leadership task in the future). We included 4-items that depicted mastery-oriented behavioral strategies (e.g., "Exert more effort in preparation for giving instructions to followers";  $\alpha = .70$ ).

#### ***Upward/Downward Social Comparison Interest and Choice***

Using a modified measure from past implicit theory work (Nussbaum & Dweck, 2008), participants rated their interest in viewing strategies used by individuals who completed the task and scored in the 48<sup>th</sup> percentile (downward social comparison) and individuals who scored in

the 98<sup>th</sup> percentile (upward social comparison). These responses were made using a 7-point Likert scale. Following this, participants then made a forced choice about viewing strategies (e.g., “You will only be able to view one set of strategies. Which would you like to view?” 48<sup>th</sup> percentile/98<sup>th</sup> percentile). Upon making their choice they were automatically taken to view the first corresponding strategy. From there, they were given the opportunity to view an additional strategy or return to the survey. Participants could view up to 4 additional strategies. We scored how far participants went in making these comparisons by summing the number of additional strategies viewed after the initial default strategy appeared (downward comparison strategies viewed  $M = .29$ ,  $SD = .95$ ; upward comparison strategies viewed  $M = 1.62$ ,  $SD = 1.58$ ).

### ***Practice Time***

We asked participants to indicate how much practice time they would like if they were to try the leadership task again. Responses were made on a 7-point Likert scale ranging from 1(0 *minutes*) to 7(30 *minutes*). Responses were coded to represent the amount of time desired in minutes (i.e., a response of 1 was coded as 0 minutes, a response of 2 was coded as 5 minutes, a response of 3 was coded as 10 minutes, etc.)

### ***Reattempt Interest and Choice***

Participants rated their interest in immediately reattempting the leadership task. They then made a forced choice about reattempting the task (e.g., “Would you like to try the leadership task again right now? Yes/No”). If the participants selected to try the task again, they were informed that due to time constraints they would not be able to do so.

## Exploratory Measures

### *Implicit Theories*

We used the same assessments of implicit theories of intelligence ( $\alpha = .94$ ) and emotion ( $\alpha = .84$ ) used in Study 1. However, in this case, we included them to determine whether the manipulation only impacted negative emotion appraisals or these implicit theories as well.

### Study 2 Results

Analyses were conducted following the analysis plan pre-registered on the Open Science Framework. See Table 3 for means, standard deviations, Chronbach's alpha scores, and correlations between the scales.

### Manipulation Checks

Although not pre-registered, we wanted to first confirm that we did indeed manipulate negative emotions with the leadership task and failure feedback. Thus, we conducted a paired-samples t-test comparing participants' negative emotion scores prior to receiving feedback with their scores after receiving feedback. Results indicated that negative emotions significantly increased from pre-feedback ( $M = 2.74, SD = 1.35$ ) to post-feedback ( $M = 3.79, SD = 1.54$ ),  $t(140) = -8.24, p < .001, r = .46$ . We then conducted another exploratory paired-samples t-test comparing participants' positive emotion scores prior to and after receiving feedback to verify that, alongside an increase in negative emotion, there was a decrease in positive emotion. Results indicated that positive emotion significantly decreased from pre-feedback ( $M = 4.46, SD = 1.32$ ) to post-feedback ( $M = 3.52, SD = 1.37$ ),  $t(140) = 9.36, p < .001, r = .60$ . These findings confirm that we made participants experience negative emotion. We now turn our attention to the meaning they assign to these emotions and the outcomes of these appraisals.

### Confirmatory Analyses: Hypotheses 1-4

To confirm that our manipulation of negative emotion appraisals worked, we conducted an independent samples t-test. As Levene's test of homogeneity of variance was violated, we report the more conservative adjusted values. Individuals in the enhancing condition ( $M = 4.95$ ,  $SD = .78$ ) reported significantly stronger negative-emotion-as-enhancing appraisals compared to those in the debilitating condition ( $M = 3.71$ ,  $SD = 1.05$ ),  $t(127.632) = -8.00$ ,  $p < .001$ ,  $\eta^2 = .32$ .

To investigate Hypothesis 2 (i.e., participants in the negative-emotion-as-enhancing condition will report more positive emotions after receiving failure feedback, relative to those in the debilitating condition) and Hypothesis 3 (i.e., participants in the negative-emotion-as-debilitating condition will report more negative emotions after receiving failure feedback, relative to those in the enhancing condition) we conducted a one-way MANOVA with appraisal condition as the predictor variable and positive and negative emotions after receiving failure feedback as the outcome variables. Results indicated that there were no significant differences in emotions experienced after receiving failure feedback based on appraisal condition (Wilk's Lambda = .998,  $F(2, 138) = .13$ ,  $p = .881$ ,  $\eta^2 = .02$ ).

To investigate Hypothesis 4 (i.e., participants in the negative-emotion-as-enhancing condition will report more mastery-oriented behavioral strategies), we ran three analyses. First, we conducted a one-way MANOVA using appraisal condition as the predictor variable and all continuous outcome variables related to behavioral strategies (i.e., performance regulatory strategies, interest in making upward comparisons, interest in making downward comparisons, amount of practice time desired, and interest in reattempting the task). Results indicated that there were no significant differences in behavioral strategies based on appraisal condition (Wilk's Lambda = .95,  $F(7, 132) = .94$ ,  $p = .480$ ,  $\eta^2 = .05$ ). Second, we conducted a chi-square

test for each of the dichotomous outcome variables related to behavioral strategies (i.e., upward/downward comparison choice and reattempt choice). In terms of upward/downward comparison choice, results indicated that there was no significant relationship between appraisal condition and comparison choice ( $\chi^2(1, N = 141) = .60, p = .439$ ). Similarly, there was no significant relationship between appraisal condition and reattempt choice ( $\chi^2(1, N = 141) = .24, p = .627$ ).

### **Exploratory Analyses**

To assess whether our manipulation impacted only negative emotion appraisals or if it also affected implicit theories (i.e., intelligence and emotion), we conducted a one-way MANOVA with appraisal condition as the predictor variable and self-reported negative emotion appraisals and the two implicit theories as the outcome variables. The overall MANOVA is significant (Wilk's Lambda = .67,  $F(3, 137) = 22.40, p < .001, \eta^2 = .33$ ) and follow-up univariate analysis reveal this is driven only by the difference in negative emotion appraisals ( $F(1, 139) = 64.19, p < .001, \eta^2 = .32$ ). The manipulation did not affect beliefs about intelligence ( $F(1, 139) = .250, p = .618$ ) or emotion  $F(1, 139) = .351, p = .554$ ). This provides additional evidence for the independence of the appraisal construct from implicit theories.

We next examined relationships between self-reported negative emotion appraisals and our outcome measures while controlling for manipulated appraisal condition—these analyses were not pre-registered and are purely exploratory but allowed us to see if we can replicate findings from Study 1. Results indicated that, controlling for condition, negative-emotion-as-enhancing appraisals are significantly related to positive emotions ( $\beta = .21, t = 2.05, p = .043$ ; 95% CI .01, .50), mastery-oriented performance regulatory strategies ( $\beta = .21, t = 2.03, p = .045$ ; 95% CI .004, .37), and interest in making upward comparisons ( $\beta = .21, t = 2.13, p = .035$ ; 95%

CI .02, .61; see Table 4). Negative emotion appraisals were not significantly related to any other outcome (i.e., negative emotions, interest in making downward comparisons, interest in reattempting the task, or length of desired practice time). It is important to note that due to the number of tests conducted, we suggest that these findings be interpreted with caution.

### **Study 2 Discussion**

In summary, in Study 2, we successfully manipulated negative emotion appraisals. However, our results failed to support our remaining preregistered hypotheses as our experimental manipulation did not move the needle on severity of emotions experienced or behavioral strategies. However, an exploratory analysis replicated and extended patterns found in Study 1 when using self-reported negative emotion appraisals.

### **General Discussion**

In the current work, we explored the way that individuals think about, or appraise, experiencing negative emotions and how these appraisals, in turn, impact self-regulation. More specifically, across two studies, we examined how negative emotion appraisals impact the severity of emotional experiences and inform behavioral strategies in the wake of setbacks. Our findings were inconsistent across these studies. In Study 1, as hypothesized, we found evidence that individuals who made negative-emotion-as-enhancing appraisals experienced less severe negative emotions and engaged in more mastery-oriented behavioral strategies following a setback compared to those who made negative-emotion-as-debilitating appraisals. In Study 2, although we successfully manipulated negative emotion appraisals temporarily using a brief one-shot intervention, we did not replicate either of the findings from Study 1. There are a few important limitations in the current work that may provide insight into these inconsistencies.

### **Limitations**

One limitation concerns the artificial nature of the laboratory task used in Study 2. In Study 1, participants described a personal goal that they had set for themselves. By virtue of being self-selected, the goal was likely to be perceived as relevant and valuable to the participant, thereby increasing the significance of the failure to achieve it. In contrast, in Study 2, participants were assigned a goal: successful delivery of instructions. Although it appears that participants generally viewed the task as having self-relevance and importance ( $M = 5.93$ ,  $SD = .88$ ), this may have reflected social desirability. The valuation of imposed goals may differ in important ways from self-selected goals. We note that it is possible that negative emotion appraisals do not function the same way or are not as informative when a goal is not set within a domain of an individual's choosing.

Another limitation concerns the severity of the failure feedback we provided to participants in Study 2. While previous studies have provided feedback using percentile ranks as low as 37, we chose to inform participants that they and their followers scored in the 63<sup>rd</sup> and 61<sup>st</sup> percentiles, respectively (see Appendix C). We reasoned that they would equate these scores with receiving a low D on an assignment – a severe setback, but not a complete failure. It is possible that our use of a higher percentile rank did not make the failure salient enough. For example, although negative emotion significantly increased from baseline after receiving failure feedback, the average post-feedback score was only 3.79 – a score closer to ‘neutral’ than severely negative. This potentially indicates that the feedback did not generate a threat to identity that was sufficient enough to elicit negative emotions to the degree necessary for negative emotion appraisals to become applicable. As such, we suggest that there may be a tipping point at which the severity of the negative emotion experienced outweighs the effects of short negative emotion appraisal manipulations.

Participant fatigue and time constraints may also have played a role in affecting behavioral responses – specifically, the choice to reattempt the task immediately. The study was described as taking place over the course of one hour. The option to reattempt the task was presented near the end of the study, which, for the average participant, was nearly 40-45 minutes after they arrived. Upon reaching this point, it is possible that participants were fatigued or had other upcoming commitments and did not wish to spend more time in the lab.

Furthermore, we did not reach our intended sample size ( $N = 220$ ) due to time constraints. As such, this study may have been underpowered, potentially making it difficult to detect the presence of effects.

In addition to the above limitations, we would also like to acknowledge that we interpreted upward comparisons and downward comparisons as indicators of adopting mastery-oriented and helpless-oriented behavioral strategies, respectively. This interpretation rests on the assumption that making downward comparisons is motivated by a need to protect the self, rather than the motivation to learn. However, it can be argued that individuals may use this strategy to learn ‘what not to do’, which can be informative. When considered in this context, it is possible that downward comparisons align with mastery-oriented behavioral strategies. Nonetheless, we failed to find differences for either strategy—this is a conceptual replication failure of Nussbaum and Dweck’s (2008) work.

Finally, we manipulated negative emotion appraisals using two methods - a short popular news article intended to convey a narrative that closely aligned with lay theories about negative emotion and a video intended to provide information about negative emotion from a more scientific (i.e., self-regulatory) perspective. As both methods have demonstrated success in temporarily shifting various implicit theories and stress-induced arousal appraisals (e.g.,

Aronson, Fried, & Good, 2002; Burnette, 2010; Crum et al., 2013; Nussbaum & Dweck, 2008; Orvidas, Burnette, & Russell, 2018), we used a combined approach in an effort to strengthen the effects of the manipulation. However, this choice makes it difficult to disentangle whether the article or video was the more effective component in manipulating negative emotion appraisals. Future research should implement designs intended to help identify which components are necessary and which are sufficient for manipulating appraisals.

### **Future Directions**

It is evident that more work needs to be done to explore the link between self-regulatory processes and negative emotion appraisals. We suggest several potential avenues for research in this area. First, the extent to which negative emotion appraisals are linked to a third self-regulatory process (i.e., goal setting) should be explored. In the current work, we examined how appraisal type is associated with the behavioral strategies employed and the severity of the negative emotion experienced upon encountering a setback (i.e., the goal operating and goal monitoring processes of self-regulation, respectively). However, previous work has consistently demonstrated that implicit theories are indeed also linked to goal setting (see Burnette et al., 2013 for review). More specifically, incremental theorists tend to set learning-oriented goals while their entity theorist counterparts set achievement-oriented goals. As the current work provides some evidence to suggest that the link between appraisals and self-regulatory processes may mirror the link between implicit theories and self-regulatory processes, future work should investigate the potential relationship between goal-setting and negative emotion appraisals.

Next, the extent to which negative emotion appraisals are domain-specific should be explored. More specifically, future work should seek to understand whether individuals generally ascribe to one appraisal type (i.e., enhancing vs. debilitating) consistently across domains or

whether these appraisals, like implicit theories, are domain specific. For example, does someone who perceives the guilt and embarrassment that they experience after cheating on their diet to be enhancing also perceive those same emotions to be enhancing when they occur in the context of failing an important exam? Investigating this will help generate a clearer picture of how negative emotion appraisals, as well as appraisals of other transient experiences, generally function.

Relatedly, as recent work has demonstrated that implicit theories of psychopathology (e.g., anxiety, depression) are distinguishable from each other in important ways (Schroder, Dawood, Yalch, Donnellan, & Moser, 2016), we suggest that future work should assess appraisals of specific negative emotions such as anxiety, anger, or sadness and their individual link to self-regulation. In the current work, we assessed appraisals of negative emotion all-inclusively. That is, we asked participants about how they thought about experiencing negative emotion in general – without specifying any particular emotions (e.g., “Experiencing negative emotion depletes my motivation”). Across both studies, it is likely that each participant was answering with the negative emotions that were most personally salient to them in mind. It is possible that different negative emotions prompt specific appraisals and, by extension, self-regulatory responses. For example, a high arousal negative emotion such as anger may be more likely to be perceived as motivating and thus promote mastery-oriented responses, whereas a low arousal negative emotion such as sadness may be more likely to be perceived as one that encourages withdrawal and thus promotes helpless-oriented responses.

Additionally, future work can explore how negative emotion appraisals and various implicit theories may interact with one another. For example, upon encountering a setback in an academic context such as receiving a lower grade than desire on an exam, both implicit theories of intelligence and negative emotion appraisals are highly relevant. There are various ways in

which these implicit theories and appraisals may interact to produce different patterns of self-regulatory responses. For example, an incremental theory of intelligence and a negative-emotion-as-enhancing appraisal may promote mastery-oriented behavioral strategies. But what would happen with a combination of an incremental theory intelligence and an emotion-as-debilitating appraisal? One suggests mastery-oriented behavioral strategies, while the other suggests helpless-oriented strategies. Uncovering the relationship between implicit theories and negative emotion appraisals may help to explain more of the variability for those whose behavior does not align with what their implicit theory alone might predict. Additionally, such work can inform future interventions—perhaps it is best to target both implicit theories and negative emotion appraisals in tandem.

Finally, potential mediating mechanisms between negative emotion appraisals and self-regulatory processes should be explored. Although results of our preregistered analyses did not provide support for hypotheses in Study 2, our exploratory analysis replicated the pattern of associations between self-reported negative emotion appraisals and behavioral outcomes found in Study 1. More specifically, in Study 1, negative-emotion-as-enhancing appraisals predicted reports of more mastery-oriented performance regulation strategies in response to a past failure to achieve a personal goal. In Study 2, negative-emotion-as-enhancing appraisals also predicted an intention to engage in more mastery-oriented performance regulatory strategies on a similar task in the future, when controlling for experimental condition. In addition to this, these appraisals also predicted greater interest in making upward social comparisons. Although these findings provide support for an association between negative emotion appraisals and behavioral strategies, we cannot draw causal conclusions and causation may be different than predicted. For example, it is possible that negative-emotion-as-enhancing appraisals allow individuals to still

feel efficacious in the wake of setbacks. Indeed, another part of the self-regulatory monitoring system is an evaluation of whether one should continue the goal pursuit (see Burnette et al., 2013). For individuals making negative-emotion-as-enhancing, relative to debilitating, appraisals the negative emotions signal the need for a different strategy rather than indicating incompetence or inferiority, allowing an individual to believe that success in the future is possible and additional effort worth it. As such, we suggest investigating self-efficacy as a potential important mediator.

### **Conclusion**

Experiencing negative emotions in the wake of setbacks is an inevitable phenomenon rooted in self-regulatory processes. As such, it is important to understand what people believe about experiencing these negative emotions and how these beliefs impact emotional and behavioral outcomes. We hope this initial work provides an empirical base for future work that seeks to elucidate the potential link between negative emotion appraisals (or appraisals of other transient experiences) and self-regulation.

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**Table 1**

*Study 1: Means, standard deviations, observed range, Chronbach's alpha scores, and correlations between scales (N = 283).*

Variable	<i>M</i>	<i>SD</i>	Range	$\alpha$	1	2	3	4	5	6
1. NEA	3.88	1.14	5.63	.86	-	-	-	-	-	-
2. NES	4.97	1.27	6.00	.85	-.24*	-	-	-	-	-
3. PRS	4.62	1.16	5.83	.74	.24*	-.01	-	-	-	-
4. ITI	4.59	1.71	6.00	.97	.08	.05	.03	-	-	-
5. ITE	4.77	1.27	6.00	.88	.25*	-.13*	.14*	.21*	-	-
6. IPT	4.33	1.67	6.00	.96	.14*	-.11	.05	.58*	.29*	-

*Note.* NEA = negative emotion appraisals, NES = severity of negative emotions recalled, PRS = performance regulatory strategies, ITI = implicit theories of intelligence, ITE = implicit theories of emotion, IPT = implicit person theories. All scales had response options ranging from 1-7.

\*  $p < .05$ .

**Table 2**

*Study 1: Results of multiple regression using negative emotion appraisals and implicit theory measures as the predictors and severity of negative emotions recalled and performance regulation strategies as the outcome variables.*

Variable	Severity of Negative Emotions Recalled			Performance Regulatory Strategies		
	$\beta$	t	<i>p</i>	$\beta$	t	<i>p</i>
NEA	-.22	-3.72	<.001	.22	3.63	<.001
ITI	.19	2.65	.009	-.003	-.05	.964
ITE	-.07	-1.05	.293	.08	1.34	.181
IPT	-.17	-2.41	.016	.002	.02	.981

*Note.* NEA = negative emotion appraisals, ITI = implicit theories of intelligence, ITE = implicit theories of emotion, IPT = implicit person theories.

**Table 3**

*Study 2: Means, standard deviations, observed range, Chronbach's alpha scores, and correlations between scales (N = 141).*

Variable	<i>M</i>	<i>SD</i>	Range	$\alpha$	1	2	3	4	5	6	7	8	9	10	11	12
1. Condition	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. NEA	4.34	1.11	5.38	.86	.56*	-	-	-	-	-	-	-	-	-	-	-
3. PrePosEm	4.46	1.32	6.00	.85	.04	.17*	-	-	-	-	-	-	-	-	-	-
4. PreNegEm	2.74	1.35	6.00	.81	.01	-.11	-.35*	-	-	-	-	-	-	-	-	-
5. PstPosEm	3.52	1.37	5.00	.84	-.01	.14	.60*	-.13	-	-	-	-	-	-	-	-
6. PstNegEm	3.79	1.54	6.00	.83	.04	-.03	-.08	.46*	-.37*	-	-	-	-	-	-	-
7. PRS	5.55	1.01	5.00	.70	.08	.19*	.02	.15	-.12	.26*	-	-	-	-	-	-
8. Upward	5.60	1.64	6.00	NA	.12	.21*	.24*	-.05	.13	.06	.38*	-	-	-	-	-
9. Downward	4.15	2.08	6.00	NA	.05	.14	-.14	.11	.07	-.01	.22*	.15	-	-	-	-
10. Reattempt	3.35	1.88	6.00	NA	-.07	.08	.21*	-.03	.17*	.05	.12	.24*	.19*	-	-	-

**Table 3** (continued)

11. Practice	14.25	7.20	30.00	NA	.13	.05	-.18*	-.22*	-.15	.11	.36*	.03	.11	-.04	-	-
12. ITI	5.50	1.24	5.00	.94	.05	.17*	.26*	-.05	.14	-.10	.16	.08	.12	-.01	-.01	-
13. ITE	4.87	1.28	6.00	.84	-.04	.12	.16	-.16	.30*	-.18*	.11	.19*	.04	.07	-.04	.08

*Note.* Condition is coded such that negative-emotion-as-debilitating = 0, negative-emotion-as-enhancing = 1. NEA = negative emotion appraisals, PrePosEm = positive emotions pre-failure feedback, PreNegEm = negative emotions pre-failure feedback, PstPosEm = positive emotions post-failure feedback, PstNegEm = negative emotions post-failure feedback, PRS = performance regulatory strategies, Upward = interest in making upward comparison, Downward = interest in making downward comparison, Reattempt = interest in immediately reattempting task, Practice = how many minutes of practice time is desired, ITI = implicit theories of intelligence, ITE = implicit theories of emotion. With the exception of Practice which had response options ranging from 0-30 in increments of 5, all scales had response options ranging from 1-7.

\* $p < .05$ .

**Table 4**

*Study 2: Results of hierarchical regression for self-reported negative emotion appraisals predicting outcome measures while controlling for manipulated appraisal condition.*

	PstPosEm	PstNegEm	PRS	Upward	Downward	Reattempt	Practice
<b>Step 1</b>							
Condition	-.01	.04	.08	.12	.05	-.07	.13
<b>Step 2</b>							
Condition	-.13	.09	-.03	-.002	-.04	-.17	.14
NEA	.21*	-.08	.21*	.21*	-.17	.17	-.03

*Note.* NEA = negative emotion appraisals, PstPosEm = positive emotions post-failure feedback, PstNegEm = negative emotions post-failure feedback, PRS = performance regulatory strategies, Upward = interest in making upward comparison, Downward = interest in making downward comparison, Reattempt = interest in immediately reattempting task, Practice = how many minutes of practice time is desired.

\*  $p < .05$ .

## CHAPTER 3 | MANUSCRIPT 2

### **Self-Regulation Mindsets: Relationship to Coping, Executive Functioning, and ADHD**

Self-regulation and executive functioning (EF) are critical for health, academic achievement, meaningful relationships, and work success (Baumeister & Heatherton, 1996; Carver & Scheier, 2012; Hofmann, Schmeichel, & Baddeley, 2012). Although traits related to self-regulatory capacity are moderately (e.g., conscientiousness; Luciano, Wainwright, Wright, & Martin, 2006) to highly heritable (e.g., Attention-Deficit/Hyperactivity Disorder [ADHD] symptoms; Faraone & Larsson, 2019), people can improve their self-regulation by learning and applying skills and strategies (Duckworth, Milkman, & Laibson, 2018)—including people with ADHD (Knouse, Teller, & Brooks, 2017). Importantly, the extent to which a person *believes* that human traits, such as self-regulation ability, are stable (fixed mindset) vs. malleable (growth mindset) impacts motivation and self-regulatory strategies (Burnette, O'boyle, VanEpps, Pollack, & Finkel, 2013). Yet, the impact of people's mindsets about the potential to change self-regulation ability itself is relatively unexplored. Although, there is a growing literature on mindsets related to *feeling* that self-regulation depletion is either debilitating or energizing (e.g., Haimovitz, Dweck, & Walton, 2019; Job, Dweck, & Walton, 2010), the current work focuses on mindsets about the fixed vs. malleable nature of self-regulatory *ability*.

We extend existing literature in three key ways. First, we investigated if growth mindsets of self-regulation ability predict more adaptive responses to setbacks on personally-relevant goals. Second, we explored when these mindsets might matter most. For example, for people who are at-risk of experiencing more frequent self-regulation failures—those who report EF

deficits and who report being diagnosed with ADHD. Third, we examined the relation between growth mindsets and risk status (i.e., EF deficits and ADHD diagnosis).

### **Mindset Theory**

Mindsets, originally referred to as implicit theories, are lay beliefs regarding the extent to which specific human traits and abilities, such as intelligence, are malleable versus fixed (Dweck, 2000; Dweck & Leggett, 1988). Within this approach, a belief that traits or abilities are relatively static and immutable is referred to as a fixed mindset (or entity theory), whereas a belief that traits or abilities are capable of being developed is referred to as a growth mindset (or incremental theory; Dweck, 2000). Mindsets are domain specific, such that an individual can have a fixed mindset about one trait or ability (e.g., intelligence) and a growth mindset about another (e.g., musical ability). Mindsets, although originally studied within the context of intelligence and perception (Molden & Dweck, 2006), have been extended to other attributes including weight (Burnette, 2010), anxiety (Schroder, Callahan, Gornik, & Moser, 2018), and addiction (Burnette, Forsyth, Desmarais, & Hoyt, 2019), to name a few (for a review see Dweck & Yeager, 2019). Additionally, previous work has focused on examining the extent to which self-regulation is perceived as a limited resource (Haimovitz et al., 2019; Job et al., 2010). In the current study, we examined mindsets of self-regulation in terms of individuals' beliefs about their ability to self-regulate as something that can be developed and changed. And, we explored how these self-regulation ability mindsets relate to responses to setbacks as well as to self-regulatory struggles.

Extensive prior work demonstrates that mindsets inform self-regulatory processes, especially in the wake of setbacks (see Burnette et al., 2013). For example, after receiving failure feedback on a practice standardized test, individuals with a growth mindset of intelligence report

experiencing fewer negative emotions compared to those with a fixed mindset (Niiya, Crocker, & Bartmess, 2004). And, individuals with growth mindsets view failures as part of the learning process and thus develop stronger feelings of self-efficacy. In contrast, individuals induced to hold more of a fixed mindset view failure as an indication of a personal deficiency, which erodes their sense of self-efficacy (e.g., Burnette, Hoyt, Dweck, & Auster-Gussman, 2017).

Additionally, growth mindsets predict engaging in fewer helpless-oriented coping behaviors. For example, after receiving failure feedback on an initial task alleged to reflect IQ, participants who were encouraged to hold a growth, relative to fixed, mindset spent more time practicing solving problems (Cury, Da Fonseca, Zahn, & Elliot, 2008). Further, experimental work suggests that these beliefs have a causal effect—teachers report that students who are taught a growth mindset are more motivated to excel (Blackwell, Trzesniewski, & Dweck, 2007). In light of these findings, we first hypothesized the following:

**Hypothesis 1 (H1):** Growth mindsets of self-regulation will predict more adaptive responses to setbacks characterized by experiencing less negative emotion, remaining efficacious about future success, and engaging in fewer avoidant coping behaviors.

Growth mindsets are particularly important for at-risk individuals. For example, a meta-analysis of growth mindset interventions demonstrated that growth mindsets are most helpful for students from low-income backgrounds (Sisk, Burgoyne, Sun, Butler, & McNamara, 2018). However, situational challenges failed to moderate the growth mindset intervention to academic achievement link (Sisk et al., 2018). Yet, additional work highlights how mindset interventions are most effective for low achieving students (Yeager et al., 2019). Furthermore, in a large meta-analysis of relations between mindsets and self-regulation, the links between mindsets and coping behaviors are strongest when the self is threatened (Burnette et al., 2013). In the current

work, we explored whether experiencing more regulatory failures, including higher self-reported executive functioning (EF) deficits or an ADHD diagnosis, acts as a risk-factor that moderates the mindset to self-regulatory responses links (i.e., emotion, efficacy, coping).

Although EF deficits are a multifaceted and multi-level construct, the function of EF is to enable self-regulation over time to meet future goals (Barkley, 2015). Thus, we conceptualized EF deficits in daily life as a plausible risk that might increase the importance of growth mindsets for motivating adaptive responses to setbacks. To measure EF deficits in daily life, we used a well-validated rating scale measure (Barkley Deficits in Executive Functioning Scale (BDEFS); Barkley, 2011). We also explored whether regulatory failure risk as represented by ADHD diagnostic status moderated the mindset to coping link. ADHD is a neurodevelopmental disorder characterized by self-regulatory difficulties and challenges that contribute to significant functional impairment across life domains (NIMH, 2016). Indeed, the EF deficits in daily life described above are often experienced by people with ADHD, although substantial heterogeneity exists in this population.

**Hypothesis 2 (H2):** Growth mindsets can help buffer against the deleterious effects of both EF deficits in daily life (Studies 1 and 2) and ADHD diagnosis (Study 2) on self-regulatory responses to setbacks.

In addition to evaluating the direct and conditional effects of mindsets on affect, cognition and behavior following perceived goal-related failures, we also evaluated associations between self-regulation mindsets and EF deficits and/or ADHD status. In prior studies, the relationship between one's mindsets and one's potential risk or ability in that domain is inconsistent. For example, mindsets of addiction do not correlate with self-reported substance use problems (Burnette et al., 2019). However, mindsets of people do correlate with anxiety and

depressive symptoms such that people with these symptoms hold weaker growth mindsets (Schleider, Abel, & Weisz, 2015). Of relevance to the current work is the link between mindsets of self-regulation and self-regulation difficulties. However, considering the novelty of the self-regulation mindset construct and the inconsistent findings in the literature, it was not clear what the relation would be. For example, people with ADHD hold complex views about the causes of the deficit, including believing it is an illness or that it is part of one's personality or a different way of seeing the world, indicating an incorporation of both biological and psychological causes (Wong, Hawes, Clarke, Kohn, & Dar-Nimrod, 2018). Yet, this is more about the etiology of ADHD, whereas we were interested in mindsets about the malleability, or lack thereof, of self-regulation and their relation to the degree of self-regulatory struggles.

There are a number of theoretical reasons to expect risk for self-regulatory failure to be negatively correlated with growth mindsets. First, experiencing EF deficits may contribute to a stronger belief in the stable nature of these deficits. By definition, those with EF deficits experience higher rates of self-regulation failure and, over time, they may come to believe that this pattern is not only long-standing, but also inevitable and immutable. Additionally, individuals with fixed mindsets about other conditions (e.g., addiction and depression) are less likely to use help-seeking strategies such as effective treatment (e.g., Salem, Winer, Jordan, & Dorr, 2019), which may contribute to lasting conditions and reinforcement of the fixed mindset. Second, for ADHD, the brain-based understanding and medication-based treatments for those diagnosed may contribute to these individuals more strongly endorsing a fixed view of their own self-regulation than individuals who are not diagnosed. Brain-based explanations of mental disorders may increase essentialist thinking, including increasing beliefs that disorders are fixed and less controllable (Lebowitz, 2014). For example, in a sample of mental health professionals,

labeling a child with ADHD, changes beliefs and encourages brain dysfunction and neurological attributions for children's behaviors (Dryer, Kiernan, & Tyson, 2006). Third, Bandura's (1982) self-efficacy theory, a belief system similar to, yet distinct from growth mindsets, is postulated to develop in large part based on mastery experiences. It is likely that growth mindsets also develop, in part, based on one's individual experiences with that particular attribute. And, individuals who regularly struggle to develop better self-regulatory skills (e.g., those with EF deficits and/or ADHD), are likely to believe that this ability is more innate, rather than something that can develop with effort and hard work. Based on the above theoretical review, we postulate the following:

**Hypothesis 3 (H3):** Growth mindsets of self-regulation will be negatively correlated with EF deficits and ADHD diagnosis.

## Methods

### Participants

We recruited two hundred and four participants from Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010; Wymbs & Dawson, 2015) for Study 1 (35.8% female, mean age = 30.84;  $SD = 10.03$ ) and 184 undergraduate students from a southeastern university for Study 2 (68.5% female, mean age = 19.92;  $SD = 5.78$ ). Participants completed an online survey advertised as a study examining responses to failing to achieve an important personal goal. Across both Study 1 and Study 2, the majority of participants were white (85.8% and 70.1%, respectively) with a small percentage of participants identifying as Asian (6.4% and 13.6%), African American (5.4% and 7.1%), Native American (0.5%, 1.1%), and Other (2.0% and 8.2%). Additionally, of the participants in Study 2,

18.5% ( $n = 34$ ) indicated having been previously diagnosed with ADHD. As applicable, participants received payment or course credit in exchange for their participation.

### **Procedure**

In both studies, participants first provided demographic information and completed a questionnaire assessing their mindsets of self-regulation and EF deficits. Next, they completed a brief writing exercise as follows: “Please think of a recent time when you did not meet a significant goal that you set for yourself. Take a moment and reflect on what happened and how you felt, what you thought, and what you did. Next, write about 5 sentences describing the situation and your experience.” Immediately following, participants completed a questionnaire assessing the negative emotions they experienced as a result of failing to achieve their goal, the coping strategies they subsequently utilized, and their expectations about future goal achievement. In Study 2, participants also indicated their ADHD diagnostic status history. The institutional review board approved all procedures.

### **Measures**

Responses to all of the following measures were made using a 7-point Likert scale ranging from 1(*Strongly disagree*) to 7(*Strongly agree*), unless otherwise specified.

#### ***Mindsets of Self-Regulation***

We adapted the 6-item Implicit Theories of Intelligence scale (Dweck, 2000), replacing the word “intelligence” with the phrase “ability to self-regulate” (e.g., “No matter who you are you can significantly change your ability to self-regulate”). Prior to completing the items, we defined self-regulation for participants as follows: “Self-regulation ability is the ability to control one’s actions and thoughts to meet goals.” Higher numbers represent stronger growth mindsets (Study 1  $\alpha = .88$ ; Study 2  $\alpha = .79$ ).

### ***Self-Regulatory Failure Risk***

In both studies, we administered the 20-item Barkley Deficits in Executive Functioning Scale-Short Form (BDEFS-S; Barkley, 2011) to assess EF deficits in daily life (Study 1  $\alpha = .86$ ; Study 2  $\alpha = .74$ ) which employs a 4-point Likert scale for responses. In Study 2, we used a single item to determine participants' ADHD diagnostic status (e.g., "Have you ever been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD)? Yes/No"). Although likelihood of ADHD diagnosis depends on a number of factors and self-reported diagnosis is not comparable to a comprehensive research-based assessment with differential diagnosis, prior diagnosis of ADHD by an outside professional indicates that the participant or important people in their lives believed that functional impairment or distress due to self-regulation problems was severe enough to warrant professional attention (Bolton, 2013).

### ***Negative Emotions***

Using a 5-point Likert scale ranging from 1 (*Not at all true*) to 5 (*Very true*), participants rated the extent to which they experienced seven different negative emotions (i.e., helpless, frustrated, vulnerable, bad, angry, depressed, and anxious) after failing to achieve their goal<sup>8</sup> (Study 1  $\alpha = .88$ ; Study 2  $\alpha = .85$ ).

### ***Self-Efficacy***

We included four items regarding participants' expectations about achieving their goals currently and in the future (e.g., "I feel confident that, in the future, I can meet goals like this"; Study 1  $\alpha = .90$ ; Study 2  $\alpha = .86$ ).

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<sup>8</sup> In Study 2, we also asked participants to rate the extent to which they felt shame and guilt. To replicate Study 1, we excluded these from our main analyses in order to match the negative emotion scales across both studies. Self-regulation mindsets were significantly correlated with shame ( $r = -.24, p = .001$ ) but not guilt ( $r = -.08, p = .28$ ).

### ***Avoidant coping***

We used three items adapted from an avoidant coping measure (Burnette, 2010; Ommundsen, 2003) to assess participants' behavioral responses to their failure (e.g., "I gave up on my goal altogether"; Study 1  $\alpha = .83$ ; Study 2  $\alpha = .84$ ).

### **Results**

See Table 1 for means, standard deviations, alphas and correlations for both Study 1 and Study 2.

#### **Study 1**

Our first hypothesis was supported. A bivariate correlation indicated that mindsets of self-regulation were significantly related to negative emotion ( $r = -.19, p = .008$ ), self-efficacy ( $r = .21, p = .003$ ), and avoidant coping ( $r = -.21, p = .003$ ) such that individuals with growth mindsets of self-regulation experience less negative emotion, are more optimistic about achieving goals in the future, and engage in fewer avoidant behaviors. Second, to explore if these relations were moderated by EF deficits, we used Hayes' (2013) PROCESS macro, Model 1. Results indicated that EF did not significantly moderate the association between mindsets and negative emotion,  $t(200) = -.31, p = .760$ , mindsets and self-efficacy,  $t(200) = -.24, p = .809$ , or mindsets and avoidant coping,  $t(200) = -.93, p = .355$ . Third, a bivariate correlation indicated that there was a significant negative correlation between growth mindsets of self-regulation and EF deficits ( $r = -.32, p < .001$ ).

#### **Study 2**

Effects in Study 1 replicated in Study 2. Bivariate correlations indicated that mindsets of self-regulation were significantly related to negative emotion ( $r = -.20, p = .008$ ), self-efficacy ( $r = .38, p < .001$ ), and avoidant coping ( $r = -.21, p = .004$ ). Second, as in Study 1, results indicated

that EF did not significantly moderate any of the three relationships: negative emotions,  $t(178) = 1.85, p = .066$ ; self-efficacy,  $t(178) = .35, p = .724$ ; avoidant coping,  $t(178) = -1.06, p = .290$ . In addition, we also tested for moderation by ADHD diagnostic status. Similarly, results of these analyses indicated that ADHD diagnostic status did not moderate any of the three relationships: negative emotions,  $t(178) = -.28, p = .783$ ; self-efficacy,  $t(178) = .90, p = .368$ ; avoidant coping,  $t(178) = -1.19, p = .237$ . Third, bivariate correlations indicated a significant negative correlation between mindsets of self-regulation and EF deficits ( $r = -.26, p < .001$ ) as well as mindsets and ADHD diagnostic status ( $r = -.33, p < .001$ ).

### ***Exploratory Analyses***

We also explored the correlations among growth mindsets and the three outcomes in the subsample ( $n = 34$ ) of adults who reported having been diagnosed with ADHD. Bivariate correlations indicated that growth mindsets of self-regulation were only significantly related to self-efficacy ( $r = .44, p = .010$ ). The relationships between mindsets and negative emotions ( $r = -.23, p = .199$ ) and mindsets and avoidant coping ( $r = -.32, p = .072$ ) were not statistically significant. As indicated by above moderator analyses, these correlations are similar in size to the relations among constructs for individuals who are not diagnosed with ADHD but likely not statistically significant due to the small sample of participants who report having been diagnosed with ADHD.

## **Discussion**

Across two studies, we explored the relation between growth mindsets of self-regulation ability and responses to goal setbacks. As predicted, in both studies, we found that stronger growth mindsets of self-regulation ability related to reporting less negative emotion, remaining optimistic about achieving future goals, and engaging in fewer avoidant coping behaviors in the

wake of a personally-relevant setback. Neither EF deficits nor ADHD diagnostic status moderated any of these relations. Additionally, associations among growth mindsets and outcomes were similar in the subsample of individuals diagnosed with ADHD (Study 2). And, we found growth mindsets of self-regulation to be negatively correlated with EF deficits (Study 1 and 2) and ADHD diagnosis (Study 2). We extended the conceptualization of mindsets of self-regulation from being primarily concerned with perceptions about depletion (Haimovitz et al., 2019; Job et al., 2010) to include individuals' beliefs about their capacity to change and develop the ability to self-regulate. We also replicated past studies showing that growth mindsets predict less negative emotion, more positive expectations and less avoidant coping in the wake of personally relevant setbacks (e.g., Burnette, 2010).

### **Applications**

These findings have important potential applications. For example, mindsets offer insight into cognitive and behavioral processes that may link symptoms/deficits to impairment. In part, the cognitive-behavioral model of ADHD posits that, as a result of chronic failure experiences, adults with the disorder may develop patterns of negative, self-defeating beliefs and avoidant behaviors that reduce their capacity to engage with effortful self-regulation skills (Ramsay, 2002; Safren, Sprich, Chulvick, & Otto, 2004). Our results suggest that fixed self-regulation mindsets may be one of the cognitive consequences of experiencing ADHD-related impairment. Mindsets may also contribute to ongoing impairment. Prior studies identify negative self-concept (Eddy et al., 2018) and problematic perfectionism (Strohmeier, Rosenfield, DiTomasso, & Ramsay, 2016) as potential cognitive contributors to impairment in ADHD. Although preliminary, our results support the notion that believing that self-regulation abilities are not changeable (i.e., fixed

mindset) may be another set of problematic cognitions that might contribute to functional impairment in people with ADHD and other EF deficits.

The study of self-regulation mindsets may also have implications for enhancing cognitive-behavioral treatments that are based on helping adults with EF deficits and/or an ADHD diagnosis to learn and deploy self-regulation skills to reduce functional impairments associated with the disorder. If people with EF deficits or ADHD believe that their self-regulation abilities are fixed, they may see little value or be reluctant to engage in interventions that teach skills intended to improve those abilities. Because CBT treatments are predicated on the notion that self-regulation abilities are, in fact, malleable, self-regulation mindsets may predict or play a role in the process of therapeutic change during these interventions. For example, in CBT for social anxiety disorder, De Castella and colleagues (2015) found that growth mindsets of anxiety increased during CBT relative to a waitlist control group and that mindsets mediated the effect of treatment on post-CBT social anxiety. Additional prospective clinical studies will be needed to systematically investigate these possibilities and to determine whether targeting self-regulation mindsets during CBT for ADHD might be a useful adjunctive strategy.

### **Limitations and Future Directions**

There are a few key limitations to the current work that should be noted and addressed before putting findings into practice. First, we relied on self-reports to assess participants' EF deficits and ADHD diagnostic status. Future studies should employ a multi-informant approach to assessing EF and ADHD (e.g., collecting behavioral reports from others). In addition, the clinical sample size in our study was limited ( $n_{ADHD} = 34$  vs.  $n_{non-ADHD} = 150$ ) and scores on the EF scale represent a non-clinical sample. Thus, there could be a floor effect as both

samples had intact EF. Future studies should seek to replicate findings using a larger sample of participants with more clinically relevant EF levels and ADHD diagnoses. Second, we did not measure other types of mindsets to assess the potential relationship between mindsets of self-regulation and other mindsets relevant to participants' setbacks; future studies should assess a broader range of mindsets, including examining how mindsets about self-regulation ability may interact with mindsets about the experience of being depleted. Third, both studies were correlational in nature, preventing us from making temporal or causal claims. Future work could experimentally manipulate mindsets about self-regulation ability and then compare responses to setbacks across conditions. Furthermore, additional research should include behavioral outcomes, as we relied on participants' self-reported coping in response to a recent failure. Collecting data on behavioral responses to self-regulatory failures as they occur (e.g., opting to put in more or less practice time before reattempting a failed task) would avoid the pitfalls of retrospective recall.

## **Conclusion**

Despite limitations, these exploratory studies introduced the construct of *self-regulation ability mindsets* and presented preliminary evidence that such beliefs are associated with affective, cognitive, and behavioral coping responses in the wake of setbacks. The relationship between mindsets and coping did not depend on the level of EF deficits or ADHD status, but people with these characteristics were less likely to endorse a growth mindset. Additional studies in clinical samples will be needed to replicate effects and to shed light on whether growth mindsets might be a useful treatment target in cognitive-behavioral therapies of ADHD and other disorders of self-regulation. We hope this initial extension of the mindset literature to self-

regulation ability fosters future work examining the potential of growth mindset interventions to help individuals with disorders of self-regulation to cope more effectively.

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**Table 1**

*Means, standard deviations, alphas and correlations between scales for Study 1 (N = 204) and Study 2 (N = 184).*

Study	Variable	<i>M</i>	<i>SD</i>	$\alpha$	1.	2.	3.	4.	5.	6.
1	1. ITSR	5.22	1.02	.88	-	-	-	-	-	NA
	2. ExecFunc	35.40	11.13	.86	-.32***	-	-	-	-	NA
	3. NegEm	3.11	1.01	.88	-.19**	.50***	-	-	-	NA
	4. Efficacy	5.32	1.39	.90	.21**	-.26***	-.15*	-	-	NA
	5. Avoidant	3.43	1.68	.83	-.21**	.44***	.22**	-.49***	-	NA
2	1. ITSR	5.39	.86	.79	-	-	-	-	-	-
	2. ExecFunc	36.60	9.23	.74	-.26***	-	-	-	-	-
	3. NegEm	3.05	1.00	.85	-.20**	.44***	-	-	-	-
	4. Efficacy	5.43	1.16	.86	.38***	-.35***	-.16*	-	-	-
	5. Avoidant	3.25	1.70	.84	-.21**	.35***	.27***	-.39***	-	-
	6. ADHD	NA	NA	NA	-.33***	.47***	.15*	-.22**	.20**	-

*Note.* ITSR = mindsets of self-regulation, ExecFunc = EF deficits, NegEm = negative emotions, Efficacy = self-efficacy, Avoidant = avoidant coping, ADHD = ADHD diagnostic status coded as 0 = non-ADHD, 1 = ADHD.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

## CHAPTER 4 | MANUSCRIPT 3

### **Mental Illness and Stigma Reduction: A Mindset Perspective**

In the United States, mental illness – a health condition that affects the way one thinks, feels, and behaves – is relatively commonplace. Approximately 1 in 5 adults report experiencing mental illness each year (National Alliance on Mental Illness, 2019). These individuals carry a burden that is twofold. First, they must cope with the symptoms of their mental illness which often adversely affect daily functioning. Second, individuals with mental illness must also contend with the ramifications of belonging to one of society’s most highly stigmatized groups (Corrigan, 1998; Corrigan et al., 2005; Rüsçh et al., 2005). These ramifications range from suffering decreases in self-esteem and self-efficacy and experiencing negative interpersonal interactions to encountering great difficulties in securing housing and employment (Bordieri & Drehmer, 1986; Farina & Felner, 1973; Farina et al., 1974; Gouvier et al., 2003; Wahl 1999) and facing the injustices served by a society that criminalizes mental illness (Corrigan, 2004; Corrigan et al., 2005; Rüsçh et al., 2005; Teplin, 1984).

Given the heavy personal toll that the stigma attached to mental illness can exact on individuals, it is imperative for researchers to continue to seek effective ways of reducing it. In the current work, I explore the utility of applying one social-cognitive perspective, namely the mindset framework, in such an effort.

#### **Mindsets and Stigma**

Mindsets, also known as implicit theories, are individuals’ commonsense beliefs regarding the malleability of various human attributes (Dweck, 2000; Dweck & Leggett, 1988; Molden & Dweck, 2006). Within this perspective, the belief that attributes are relatively static and immutable is referred to as a fixed mindset (or entity theory). In contrast, the belief that

attributes are changeable with experience, effort, and adequate resources is referred to as a growth mindset (or incremental theory). It is important to note that mindsets both fall along a continuum and are domain specific. This means that individuals can hold very strong growth-oriented beliefs about an attribute in one domain (e.g., weight), more moderate growth-oriented beliefs about an ability in yet another (e.g., musical ability), and strong fixed-oriented beliefs about still another attribute in a different domain (e.g., intelligence).

Several lines of mindset-related research demonstrate how individuals' mindsets are integral to the process of person perception. This has perhaps been most well-documented in the subset of literature examining mindsets regarding personality and morality (e.g., beliefs about the extent to which people can fundamentally change the kind of person they are as well as their moral character, respectively; Chiu et al., 1997; Dweck et al., 1993, 1995; Haselhuhn et al., 2010). In these domains, endorsing a stronger fixed mindset is associated with a greater likelihood of making trait-focused, rather than process-focused judgements about others (i.e., giving greater consideration to the role of personality traits, rather than the dynamics of specific social environments, when assessing social behavior; Chiu et al. 1997; Dweck et al., 1995; Molden & Dweck, 2006). Such judgments have important implications for stereotyping – itself a known a vehicle for harmful prejudicial attitudes and discriminatory behaviors (Chiu et al. 1997; Dovidio et al. 1996; Dweck et al., 1995; Dweck & Leggett, 1998; Gervy et al., 1999; Levy & Dweck, 1999; Levy et al., 1998, 2001; Molden & Dweck, 2006). Specifically, trait-focused judgments, are linked to more readily and strongly endorsing stereotypes and disregarding stereotype inconsistent information (Levy et al., 1998; Molden & Dweck, 2006; Plaks et al., 2001, 2005). Based on such findings it seems that cultivating growth-oriented beliefs may be a particularly useful approach to reducing stigma. However, a recent line of mindset-related work

examining what has been dubbed the double-edged sword effect suggests that a more nuanced approach may be necessary.

### **Double-Edged Sword Effect and Compensatory Messaging**

Drawing on attribution theory and the essentialist thinking literature, the double-edged sword effect posits that, indirectly, typical growth mindset messages serve to both diminish and improve outcomes in stigmatized domains (Hoyt & Burnette, 2020). More specifically, holding a growth mindset, or endorsing the belief that an attribute or ability is changeable with effort and adequate resources, can effectively serve to increase prejudice against a stigmatized group via strengthening what are referred to as onset blame attributions - perceptions that an individual is personally responsible for the onset of their condition.

In addition to informing onset blame attributions, mindsets also have important implications in terms of social essentialism. Social essentialism is the belief that categories of people that differ on socially relevant attributes such as race, gender, or mental illness are fundamentally distinct kinds of people that have an inherent and underlying essence (Rothbart & Taylor; Haslam, 1998). To the extent that a social group is associated with devalued traits, essentialist thinking predicts prejudice (Hoyt et al., 2017, 2019). Holding a growth mindset, believing that attributes are changeable, necessarily implies that the boundaries defining categories are not hard-set and thus social groups have the potential to change their status in the future. As such, growth mindsets can reduce essentialist thinking, and by extension, prejudice against stigmatized groups (Hoyt et al., 2017, 2019).

In light of these conflicting effects regarding blame attributions and essentialist thinking, researchers have sought to alter the typical growth mindset message in such a way that maintains the benefits of believing that an attribute is changeable while minimizing its costs. As

demonstrated by work regarding mindsets of weight (Burnette et al., 2017; Hoyt et al., 2017, 2019), one effective alteration involves stressing that, although they are capable of change in the future, individuals are not to be blamed for the onset of the relevant attribute or condition. Such a messaging approach has been termed ‘compensatory growth messaging’ (see Hoyt & Burnette, 2020).

In the current work I seek to determine if the double-edged sword effect replicates in the domain of mental illness and what the subsequent implications may be for mindset-based interventions aimed at reducing the stigma attached to mental illness.

### **Current Work**

Presently, I define ‘mindsets of mental illness’ as people’s beliefs about the extent to which individuals with mental illness can change their mental condition. People considered to hold growth mindsets of mental illness are those who believe that individuals with mental illness are indeed capable of change. I suspect that there are several varied factors that may undergird the endorsement of growth-oriented beliefs. For example, some people might endorse the stereotype that experiencing mental illness results from a weakness of character (i.e., a lack of self-discipline or mental toughness), which itself is necessarily predicated on the assumption that certain traits can be cultivated with effort. Alternatively, others may gravitate towards growth-oriented beliefs based simply on the knowledge that treatment options (e.g., medication or talk therapy) for individuals afflicted with mental illness exist and are available for use. These are but two examples of how individuals may arrive at endorsing a growth mindset of mental illness.

Regardless of from where such mindsets stem, I posit that they have important implications in terms of both blame attributions and essentialist thinking. More specifically, believing that a mental condition is changeable might increase attributions of blame by thrusting

the onus of responsibility primarily on the individual with mental illness through encouraging such thoughts as: they wouldn't have to suffer if they work on developing their mental toughness, take some medication, etc. From this perspective, the course of mental illness is within an individual's control and therefore individuals with mental illness are culpable for their condition. Insofar as blame is positively associated with prejudice, it is likely that stronger attributions of personal blame increase prejudicial attitudes towards individuals with mental illness.

On the other hand, endorsing a growth mindset of mental illness may reduce social essentialist thinking. Specifically, believing one of the centrally defining characteristics of a particular social group (in this case, the mental condition of those with mental illness) to be malleable inherently implies that the categorical boundaries of that group are not in fact hard-set. Group membership is flexible. This poses a direct challenge to the essentialist notion that individuals with mental illness have an underlying essence that marks them as distinct. As such, growth mindsets may reduce social essentialist thinking. Given the link between essentialist thinking and prejudice, it is likely that reduced essentialist thinking decreases prejudicial attitudes towards individuals with mental illness.

In sum, I offer the following hypotheses in accordance with the double-edged sword model (See Figure 1):

H1: Growth mindsets of mental illness will be positively correlated with blame attributions.

H2: Blame attributions will be positively correlated with prejudice against the mentally ill.

H3: There will be a positive indirect effect of growth mindsets of mental illness on prejudice through increased blame attributions.

H4: Growth mindsets of mental illness will be negatively correlated with social essentialist thinking.

H5: Social essentialist thinking will be positively correlated with prejudice against the mentally ill.

H6: There will be a negative indirect effect of growth mindsets of mental illness on prejudice through reduced social essentialist thinking.

I first test these initial hypotheses in a correlational study.

## **Study 1 Methods**

### **Participants and Procedure**

I recruited 386 participants using a Human Intelligence Task (HIT) posted on Amazon's Mechanical Turk (MTurk) research platform. I paid participants \$0.50 for completing the online Qualtrics survey which contained a series of measures assessing beliefs about and attitudes towards people with mental illness.

To ensure valid and reliable MTurk data, I included a variety of recommended response validity indicators. At the beginning of the Qualtrics survey I included a CAPTCHA (Completely Automated Public Turing Test to tell Computers and Humans Apart) verification to ensure respondents were humans and not robots (Chmielewski & Kucker, 2020). Potential participants had to successfully complete the CAPTCHA to access the survey. Throughout the survey I embedded three attention check items (e.g., "on the next page, please select the year 2018") and excluded data for any participants who failed one or more attention checks ( $n = 34$ ). I also included an open-ended response item near the end of the survey to check for atypical

responding (Dennis et al., 2018). Data from any participants who either answered the open-ended question atypically (e.g., single words or nonsense answers such as “chemistry is the body of illness function”) or provided no response at all, were excluded from the final analysis ( $n = 18$ ). Finally, I checked response time per item (Wood et al., 2017) and excluded data for individuals who completed the survey faster than one second per item (SPI) unless their open-ended response indicated that they sufficiently grasped the purpose of the study ( $n = 6$ ). The final sample consisted of 328 participants, 73.8% White, 54.3% female, aged 18-74 years ( $M = 39.65$ ,  $SD = 12.62$ ). Approximately 33% of these participants ( $n = 107$ ) reported having been formally diagnosed with one or more mental illnesses at some point in their life. This is slightly lower than the national lifetime prevalence rate of approximately 46% (Reeves et al., 2011). The most commonly occurring diagnoses in my sample were depression (62%) and anxiety disorders (61%). While these rates are higher than the national averages (21% and 31%, respectively; NIMH, 2017), this is not entirely unexpected given that MTurk workers have been shown to exhibit higher prevalence rates of anxiety-related disorders and depression (Shapiro et al., 2013; Walters et al., 2018). See Table 1 for full disorder breakdown.

Informed consent was obtained electronically from all participants. The Institutional Review Board approved all procedures.

## **Measures**

Responses to all of the following measures were made using a 7-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*) unless otherwise specified.

### ***Mindsets of Mental Illness***

This 3-item measure was created for this study and assesses beliefs regarding the ability of individuals with mental illness to change their mental condition. It includes 3 fixed mindset-

oriented items (e.g., “Even if they want to, people with mental illness cannot change their mental health.”). Items were reverse coded such that higher scores reflect a stronger growth mindset of mental illness ( $\alpha = .91$ ).

### ***Blame Attributions***

This measure assesses the extent to which individuals believe people with mental illness are responsible for their condition. I combined the 3-item Willpower Subscale of the Anti-fat Attitudes Scale (Crandall, 1994; e.g., “Some people have a mental illness because they lack willpower”;  $\alpha = .65$ ) with the 5 items of blame created specifically for this study (e.g., “People with mental illness choose to be ill”  $\alpha = .91$ ) after an exploratory factor analysis revealed that all items loaded onto a single factor. In order to improve scale reliability, I removed one of the items belonging to the Willpower Subscale. Doing so increased the reliability of the composite scale from  $\alpha = .86$  to  $\alpha = .93$ . Higher scores indicate more blame.

### ***Essentialist Beliefs About Mental Disorders***

This 8-item measure assesses the extent to which individuals believe that people with a mental illness have an underlying essence or true nature that, while not directly observable, marks them as distinct (Hantzi et al., 2019). It includes two subscales: Entitativity Dimension (e.g., “Mental disorders are relatively uniform disorders, so that people with a specific mental disorder are very similar to one another”;  $\alpha = .78$ ) and Natural Kinds Dimension (5 items; e.g., “Mental disorders are a category that is natural, rather than just being an artificial product of people’s efforts to classify mental disorders”;  $\alpha = .34$ ). In order to improve reliability, I removed the first item of the Natural Kinds Dimension. Doing so increased reliability for the dimension itself to  $\alpha = .61$  and increased the reliability of the overall composite scale from  $\alpha = .66$  to  $\alpha = .78$ . Higher scores reflect stronger essentialist beliefs.

### ***Prejudice***

To assess prejudice against individuals with mental illness, I combined the Prejudice Towards People with Mental Illness scale (PPMI; Kenny et al., 2018) with 3 items drawn from scales used by Hegarty and Golden (2008) and Barry et al. (2014). The PPMI consists of 28 items separated into 4 subscales: Fear/Avoidance (8 items; e.g., “It is best to avoid people who have mental illness”;  $\alpha = .88$ ), Unpredictability (6 items; e.g., “The behavior of people with mental illness is unpredictable”;  $\alpha = .81$ ), Malevolence (8 items; e.g., “People who are mentally ill should support themselves and not expect handouts”;  $\alpha = .82$ ), and Authoritarianism (6 items; e.g., “People who are mentally ill should be forced to have treatment”;  $\alpha = .85$ ). The additional 3 items I included assessed perceptions of the dangerousness of individuals with mental illness (e.g., “People with mental illness are, by far, more dangerous than the general public”;  $\alpha = .88$ ). Items were coded such that higher scores reflect more prejudice ( $\alpha = .93$ ).

### ***Demographics***

Individuals self-reported on their personal history of mental illness, contact with close others (e.g., family members or friends) diagnosed with mental illness, gender, race/ethnicity, age, household income, and political ideology.

### **Study 1 Results**

I analyzed data using Hayes’ (2017) PROCESS macro, an add-on for SPSS. The PROCESS macro is an SPSS observed variable analysis tool used to analyze statistical models involving mediation, moderation, and their combination. To test my hypotheses, I conducted an indirect effect analysis using Model 4. Prejudice was entered as the outcome, blame attributions and social essentialist beliefs were entered into the regression equation simultaneously as

concurrent or parallel mediators, and mindsets of mental illness was entered as the predictor. See Table 2 for means, standard deviation, scale reliabilities, and bivariate correlations.

## Hypothesis Testing

### *H1 – H3 (Paths A, B, and AxB)*

In contrast to Hypothesis 1, Path A, an endorsement of stronger growth mindsets predicted weaker blame attributions ( $B = -.20$ ,  $t(326) = -4.69$ ,  $p < 0.001$ , 95% CI [-0.28, -0.12]). In support of Hypothesis 2, Path B, stronger blame attributions predicted greater prejudice against individuals with mental illness ( $B = .35$ ,  $t(324) = 10.12$ ,  $p < 0.001$ , 95% CI [0.28, 0.41]). Thus, in contrast to Hypothesis 3, Path AxB, there was a significant *negative* indirect effect of growth mindsets on prejudice through blame attributions ( $B = -.07$ , 95% CI [-0.11, -0.04]). See Figure 2.

### *H4 – H6 (Paths D, E, and DxE)*

In support of Hypothesis 4, Path D, an endorsement of stronger growth mindsets predicted weaker social essentialist beliefs ( $B = -.13$ ,  $t(326) = -3.53$ ,  $p < 0.001$ , 95% CI [-0.20, -0.06]). Additionally, in support of Hypothesis 5, Path E, stronger social essentialist beliefs predicted greater prejudice against individuals with mental illness ( $B = .08$ ,  $t(324) = 2.13$ ,  $p = 0.034$ , 95% CI [-0.007, 0.16]). However, in contrast to Hypothesis 6, Path DxE, there was no significant indirect effect of growth mindsets on prejudice through social essentialist beliefs ( $B = -.01$ , 95% CI [-0.03, 0.0005]). See Figure 2.

In sum, the results of my mediation analyses revealed that when considering the parallel mediators of blame attributions and social essentialist beliefs, stronger growth, relative to fixed mindsets of mental illness indirectly and *negatively* predicted prejudice. However, as the mediation path including social essentialist beliefs ultimately was not significant, the link

between growth mindsets and reduced stigma against individuals with mental illness is largely, and unexpectedly, driven by decreased attributions of blame. I conducted the additional exploratory analyses detailed below in the hopes of shedding further light on this unanticipated finding.

### **Exploratory Analyses**

A plethora of work in the mental illness literature suggests that the extent to which individuals are familiar with mental illness can impact the process of stigmatization. More specifically, findings indicate that individuals who have personal experience with mental illness (i.e., those who have had a mental illness or have experienced symptoms of psychopathology themselves) and/or those who have a close relationship with another individual who has a mental illness tend to express more positive attitudes towards individuals with mental illness (Alexander & Link, 2003; Clement et al., 2012; Corrigan et al., 2001, 2002; Holmes et al., 1999; Link et al., 1987; Penn et al. 1994;). In light of this, I conducted an initial bivariate correlational analysis examining the associations between both personal experience (operationalized as having ever been formally diagnosed with a mental illness or not) and contact with others operationalized as having one or more close personal relationships with individuals who have been diagnosed with mental illness or none) and prejudice. Results indicated that both personal experience and contact with others were negatively associated with prejudice ( $r = -.33, p < .001$ ;  $-.23, p < .001$ ). Following this, I used Hayes' (2017) PROCESS Model 1 to explore the tandem possibilities that personal experience and contact with others might moderate the link between mindsets of mental illness and blame attributions. My analyses revealed that neither factor significantly moderated the link between mindsets of mental illness and blame attributions (Personal experience  $B = -.05$ ,

$t(324) = -.59, p = .559, 95\% \text{ CI } [-0.23, 0.13]$ ); Contact with others  $B = -.07, t(311) = -.78, p = .435, 95\% \text{ CI } [-0.25, 0.11]$ ).<sup>9</sup>

### Study 1 Discussion

The findings of Study 1 are perplexing. Mediation analyses indicated that stronger growth, relative to fixed, mindsets of mental illness indirectly and *negatively* predicted prejudice against the mentally ill. Furthermore, this relationship is primarily driven by decreased attributions of blame. This particular finding is in direct contrast to a central prediction of the double-edged sword framework: growth mindsets increase prejudice by increasing blame attributions but reduce it via a decrease in essentialist thinking. In an effort to understand the mechanisms behind the unexpectedly negative relationship between growth mindsets and blame attributions, I conducted follow-up moderation analyses examining the roles of personal experience with mental illness and contact with close others diagnosed with mental illness. Results ultimately suggested that neither personal experience nor contact with close others was impacting this relationship. Eager to see if the unexpected link replicates, I conducted a follow-up correlational study.

I also sought to extend findings by adding the construct of prognostic pessimism. Prognostic pessimism is concerned with the extent to which individuals believe that a condition and/or its symptoms can improve. To the extent that people believe improvement is not possible (i.e., greater prognostic pessimism) they may adapt the attitude that individuals with mental illness have limited potential or low aptitude in a variety of domains (Schulze & Angermeyer, 2003; Wahl, 1999). Additionally, it may precipitate a desire to avoid such individuals as they are

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<sup>9</sup> While I initially dichotomized the contact with others variable into ‘none’ versus ‘any’ (i.e., having zero vs. having one or more close friends or family members diagnosed with a mental illness), I also conducted another moderation analysis with the contact with others broken into three categories: ‘none’, ‘1-2’ and ‘3+’. Results remained non-significant.

perceived to be ‘hopeless’ or lost causes (Norman et al., 2012). As stronger growth mindsets are generally associated with more hope and greater optimism about the future (Burnette et al., 2013), I postulated that they would likely be linked to less prognostic pessimism. Furthermore, based on previous work indicating that less essentialist thinking (i.e., believing a given group has an inherent, underlying essence) is associated with less prognostic pessimism, I wondered if essentialist beliefs might mediate the relationship between mindsets and pessimism.

My research questions were as follows:

1. Will the Study 1 DES findings replicate?
2. Is the relationship between mindsets of mental illness and blame attributions moderated by personal experience with mental illness (i.e., formal diagnosis or current symptoms of psychological distress) or contact with others with mental illness?
3. Is there a relationship between mindsets of mental illness and prognostic pessimism? If so, is this relationship mediated by social essentialist thinking?
4. What do people believe is the primary cause of mental illness? Does this relate to mindset, blame, social essentialism, and/or prejudice?

It is important to note that with the emergence of the novel coronavirus and ensuing global pandemic, there was a major shift in the world relevant to mental health (Khan et al., 2020) and consequently, to this study. I sought to assess this and account for it as a potential covariate.

## **Study 2 Methods**

### **Participants and Procedure**

I recruited 255 MTurk workers and 182 students enrolled in an introductory psychology course at a large Southeastern university to complete an online Qualtrics survey regarding their

beliefs about and attitudes toward individuals with mental illness. In exchange for their participation, MTurk workers received \$0.50 and psychology students received 1 research credit.

I included the same three types of response validity indicators as in Study 1 (i.e., CAPTCHA and assessment of open-response item and response time per item) to help ensure the validity and reliability of my data. After excluding those participants who failed one or more attention checks ( $n = 44$ ), provided either an atypical or no response to open-ended questions ( $n = 40$ ), and/or completed the survey faster than one second per item ( $n = 10$ ), I was left with 177 MTurk participants and 166 psychology students. As there was no significant difference between groups in terms of the primary predictor variable (i.e., mindsets of mental illness;  $M_{mturk} = 4.54$ ,  $SD = 1.53$ ;  $M_{psych} = 4.48$ ,  $SD = 1.48$ ;  $t(341) = .398$ ,  $p = .691$ ,  $\eta^2 = .001$ ) I combined the two groups, giving me a total sample size of  $N = 343$  to be used in final analyses. The majority of these participants were White (77.5%) and female (60.1%) with an average age of 31.06 years ( $SD = 15.60$ ). Similar to Study 1, approximately 29% of participants ( $n = 99$ ) reported being formally diagnosed with one or more mental illnesses in their lifetime. Similar to Study 1, this is slightly lower than the national lifetime prevalence rate of approximately 46% (Reeves et al., 2011). The most common diagnoses were anxiety disorders (80%) and depression (77%). These rates are much higher than the national averages (NIMH, 2017). However, both MTurk workers and college-aged students have been shown to exhibit higher prevalence rates of these disorders (Shapiro et al., 2013; Walters et al., 2018). Further, these data were collected in the context of a global pandemic in which there has been a substantial uptick in positive screenings for such disorders (Chirikov et al, 2020). See Table 3 for full disorder breakdown.

Informed consent was obtained electronically from all participants. The Institutional Review Board approved all procedures.

## Measures

In addition to retaining the primary measures of interest used in Study 1 (i.e., Mindsets of Mental Illness ( $\alpha = .91$ ), Blame Attributions ( $\alpha = .93$ ), Essentialist Beliefs about Mental Disorders ( $\alpha = .78$ ), and Prejudice ( $\alpha = .93$ ))<sup>10</sup>, I included the assessments listed below. Unless otherwise noted, responses were made using a 7-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*).

### *Depression, Anxiety, and Stress Scale (DASS-21)*

To assess recent symptoms of psychological distress, I administered the DASS-21 (Henry & Crawford, 2005; Lovibond & Lovibond, 1995). This measure is composed of 3 subscales related to depression (e.g., “I couldn’t seem to experience any positive feeling at all”;  $\alpha = .93$ ), anxiety (e.g., “I felt I was close to panic”;  $\alpha = .87$ ) and stress (e.g., “I tended to over-react to situations”;  $\alpha = .89$ ). Each subscale includes 7 items. Responses were made on a scale from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much or most of the time*). Higher scores indicate more symptoms of psychological distress.

### *Contact Questionnaire*

This 9-item measure (Alexander & Link, 2003) assesses the extent to which participants have had contact with other people with mental illness in different contexts. There are three categories of contact: close other contact (i.e., having a parent, sibling, child, other relative, close friend, or spouse who has been hospitalized for a mental illness; 6 items), work-related contact (i.e., having experience working or volunteering at a mental health facility/psychiatric hospital; 2 items), and public contact (i.e., having seen someone in a public place who appeared to be

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<sup>10</sup> Any items dropped from a measure in Study 1 in order to improve scale reliability were excluded from the measure entirely in Study 2.

mentally ill; 1 item). Responses to each question were made in a yes/no format. Scores for each category were summed with higher scores indicating more contact (i.e., more indirect experience) with mental illness.

### ***Prognostic Pessimism***

Created for this study, this 5-item measure assesses the extent to which individuals believe that mental illness can be treated and/or symptoms can be improved (e.g., “With the right treatment approach (e.g., talk therapy and/or medication), the symptoms of people with mental illness can improve”). Higher scores indicate more prognostic pessimism ( $\alpha = .74$ ).

### ***COVID-19 Stress: Psychological Scale***

This 3-item measure (Conway III et al., 2020) assesses the extent to which participants believe COVID-19 has negatively impacted their mental health (e.g., “I have become depressed because of the coronavirus (COVID-19)”). Higher scores indicate a stronger negative impact on mental health (i.e., being in poorer mental health;  $\alpha = .83$ ).

### ***Demographics***

Individuals self-reported on their personal history of mental illness (i.e., formal diagnoses, treatment engagement), gender, race/ethnicity, age, household income, and political ideology.

### ***Open-Ended: Causal Beliefs***

I asked participants to identify what they believe to be the primary cause of mental illness. These open-ended responses were coded by the first author using an inductive coding approach. I then explored how these causal beliefs related to the key constructs in the DES model.

## Study 2 Results

To answer my first three research questions, I again used Hayes' (2017) PROCESS macro. Specifically, for RQ1 I used Model 4 with mindsets of mental illness entered as the predictor, blame attributions and social essentialist beliefs entered into the regression equation simultaneously as parallel mediators, and prejudice entered as the outcome. For RQ2 I conducted a series of moderation analyses using Model 1 with mindsets of mental illness entered as the predictor, a measure of either personal experience with mental illness (e.g., formal diagnosis or symptoms of psychological distress) or contact with others with mental illness entered as the moderator, and blame entered as the outcome. For RQ3, I again used Model 4 with mindsets of mental illness entered as the predictor, social essentialist beliefs entered as the mediator, and prognostic pessimism entered as the outcome. Next, to answer the first part of RQ4 regarding, which required a more qualitative analysis, I followed an inductive coding approach to identify common types of causal beliefs in participants' open-ended responses. After coding was completed, I conducted a one-way MANOVA with causal belief type entered as the predictor and mindsets of mental illness, blame, social essentialist beliefs, and prejudice entered as the outcomes. See Table 4 for means, standard deviation, scale reliabilities, and bivariate correlations between scales.

### Replication Analyses

#### *RQ1: Double-Edged Sword Effect*

**Paths A, B, and AxB.** Consistent with the findings of Study 1 regarding Paths A, B, and AxB respectively, an endorsement of stronger growth mindsets predicted weaker blame attributions ( $B = -.10$ ,  $t(341) = -2.43$ ,  $p < 0.016$ , 95% CI [-0.18, -0.02]), stronger blame attributions predicted greater prejudice against individuals with mental illness ( $B = .36$ ,  $t(339) =$

10.33,  $p < 0.001$ , 95% CI [0.30, 0.43], and there was a significant negative indirect effect of growth mindsets on prejudice through blame attributions ( $B = -.04$ , 95% CI [-0.07, -0.004]). See Figure 3.

**Paths D, E, and DxE.** Consistent with the findings of Study 1 regarding Paths D and E, an endorsement of stronger growth mindsets predicted weaker social essentialism beliefs ( $B = -.17$ ,  $t(341) = -5.15$ ,  $p < 0.001$ , 95% CI [-0.24, -0.11]) and stronger social essentialism beliefs predicted greater prejudice against individuals with mental illness ( $B = .18$ ,  $t(339) = 4.13$ ,  $p = 0.034$ , 95% CI [.09, 0.26]). However, in contrast to the findings of Study 1 regarding the DxE Path (and consistent with original hypotheses), there was a significant negative indirect effect of growth mindsets on prejudice through social essentialism beliefs ( $B = -.03$ , 95% CI [-0.06, -0.01]). See Figure 3.

This pattern of mediational effects held when controlling for both COVID-19 related stress and sample type (i.e., MTurk workers vs. introductory psychology students).

## **Exploratory Analyses**

### ***RQ2: Moderation***

In this study, I assessed personal experience with mental illness with two indicators: self-reported presence/absence of a formally diagnosed mental illness and self-reported symptoms of recent psychological distress. Summing scores across all three subscales (depression, anxiety, and stress), the latter measure has a possible range of 0 to 63. In my sample, scores ranged from 0 to 49 with an average score of 13.68 ( $SD = 12.78$ ). Additionally, contact with others with mental illness was assessed across three categories: having close others (e.g., family member, friend, spouse) who have been hospitalized for mental illness, working in a mental health facility/psychiatric hospital in some capacity, and encountering a stranger in public who

appeared to be mentally ill. Although I originally intended to examine the role of each category of contact independently, unequal distributions prevented me from doing so in a meaningful way for two of the categories (i.e., work and public encounters). As such, I only used contact with close others in my analyses. Based on the frequency distribution suggesting that nearly half of the participants (47%), indicated they did not have any close others in their life who had been hospitalized for mental illness, I dichotomized the variable into having no (zero) close others versus having any (1 or more) close others previously hospitalized for mental illness.

I once again conducted an initial bivariate correlational analysis examining the associations between the two indicators of personal experience (i.e., diagnosis and recent symptoms) and contact with close others with mental illness and prejudicial attitudes. Results indicated that having a formally diagnosed mental illness and having recently experienced symptoms of psychological distress were both negatively associated with prejudicial attitudes towards the mentally ill, such that those with a diagnosis and those experiencing more symptoms exhibited less prejudice ( $r = -.32, p < .001$ ;  $r = -.16, p = .003$ ). While there was no significant association between contact with close others and prejudice, this relationship was trending in the expected negative direction ( $r = -.10, p = .080$ ).

Following this, I again used Hayes' (2017) PROCESS Model 1 to examine whether either indicator of personal experience and/or contact with close others with mental illness might moderate the negative link between mindsets of mental illness and blame attributions. In terms of personal experience with mental illness, consistent with the findings of the exploratory analysis in Study 1, having a formally diagnosed mental illness did not moderate this link ( $B = .02, t(339) = .20, p = .841, 95\% \text{ CI } [-0.16, 0.19]$ ). However, recently experiencing symptoms of psychological distress did ( $B = -.01, t(339) = -4.08, p < .001, 95\% \text{ CI } [-0.02, -0.01]$ ). More

specifically, for individuals experiencing high, relative to moderate and low levels of psychological distress, endorsing a stronger growth mindset of mental illness significantly reduced blame attributions.<sup>11</sup> See Figure 4. In terms of contact with close others with mental illness, mirroring Study 1, results revealed that such contact does not significantly moderate the relationship between mindsets of mental illness and attributions of blame ( $B = -.05$ ,  $t(339) = -0.64$ ,  $p = .523$ , 95% CI [-0.21, 0.11]).

### ***RQ3: Prognostic Pessimism***

An initial bivariate correlational analysis indicated that mindsets of mental illness are negatively correlated with prognostic pessimism, such that individuals with stronger growth mindsets are less pessimistic about improvement in symptoms/treatability of mental illness ( $r = -.33$ ,  $p < .01$ ). Follow-up mediation analyses indicated that while an endorsement of stronger growth mindsets predicted weaker social essentialist beliefs ( $B = -.17$ ,  $t(341) = -5.15$ ,  $p < 0.001$ , 95% CI [-0.24, -0.11]), social essentialist beliefs did not predict prognostic pessimism ( $B = -.04$ ,  $t(340) = -.84$ ,  $p = .402$ , 95% CI [-0.13, 0.05]). As such, social essentialist thinking does not mediate the relationship between mindsets and prognostic pessimism ( $B = .01$ , 95% CI [-0.01, 0.02]).

### ***RQ4: Causal Attributions***

Interested in garnering a better understanding of what participants *believe* about the etiology of mental illness, broadly construed, I used an open-ended question which asked participants to identify what they perceived to be the primary cause of mental illness. Following an inductive coding approach, the first author found that, by a relatively slim margin, the majority of participants (40.2%) attributed the primary cause of mental illness to psychosocial

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<sup>11</sup> Additional analyses revealed that this pattern of effects held across each subfactor (i.e., depression, anxiety, and stress).

factors (e.g., experiencing a traumatic life event, challenging or abusive family upbringing, societal pressures, etc.). 37.3% of participants attributed etiology to biological factors such as chemical imbalances in the brain and/or genetic predispositions. Additionally, some participants (18.7%) declined to identify a singular cause, stating instead that they believed mental illness to stem from a combination of biological and psychosocial factors.

Curious as to how causal attribution type might relate to key constructs of the DES model, I conducted a one-way MANOVA with causal attribution type (i.e., psychosocial vs. biological) entered as the predictor and all four constructs related to the DES model (i.e., mindsets of mental illness, blame, social essentialist beliefs, and prejudice) entered as the outcome variables. The omnibus test was significant (Wilks' Lambda = .84,  $F(4, 261) = 12.67$ ,  $p < .001$ ,  $\eta^2 = .16$ ). Follow-up univariate analyses revealed that this was driven only by the significant difference in blame between those who made psychosocial ( $M = 2.40$ ,  $SD = 1.19$ ) compared to biological ( $M = 1.66$ ,  $SD = .78$ ) causal attributions ( $F(1, 264) = 35.61$ ,  $p < .001$ ,  $\eta^2 = .12$ ).

## Study 2 Discussion

Mediation analyses corroborated the surprising findings of Study 1. Specifically, results indicate that stronger growth, relative to fixed, mindsets of mental illness indirectly and *negatively* predict prejudice against the mentally ill. Most importantly, similar to Study 1, this effect is at least in part driven by a *decrease* in blame attributions as well as a decrease in social essentialist thinking.

Exploratory moderation analyses revealed important nuance regarding the impact of personal experience with mental illness. More specifically, similar to Study 1, a formal diagnosis did not moderate the relationship between mindsets of mental illness and blame. However, the

extent to which symptoms of psychological distress have recently been experienced (i.e., within the past two weeks) did moderate this relationship, such that for those with high levels of psychological distress (i.e., symptoms of depression, anxiety, and/or stress), endorsing a stronger growth mindset significantly reduced blame attributions. In addition, consistent with the findings of Study 1, results indicated that contact with others with mental illness – specifically close others who have been hospitalized for mental illness – did not function as a significant moderator.

Additionally, qualitative analyses regarding causal attributions revealed that individuals tend to make one of two kinds of attributions regarding the cause of mental illness. That is, they attribute it either to primarily biological factors (e.g., biochemical imbalance in the brain or genetics) or primarily psychosocial factors (e.g., early trauma). Furthermore, the type of causal attributions individuals make have implications for blame. Specifically, those making psychosocial attributions, compared to biological attributions, exhibited significantly more blame. Interestingly, there were no significant differences in mindsets of mental illness, social essentialist thinking, or prejudice based on causal attribution type.

### **General Discussion**

Overall, results from both Study 1 and Study 2 suggest that the double-edged sword model of mindsets and stigma does not readily extend when examining mental illness. Across both studies, stronger growth, relative to fixed mindsets of mental illness, indirectly and negatively predicted prejudice against the mentally ill. This effect was, in part, driven by a reduction in social essentialist thinking as expected. However, it was also unexpectedly driven by a reduction in attributions of blame. Although the reduction of blame associated with a growth mindset was initially surprising as it directly contrasts with a central prediction of the

double-edged sword model, having replicated it across two relatively large independent samples increases my confidence in its veracity. Below, I offer a few post-hoc explanations for why these results may not be so counter-intuitive.

First, I posit that the wording of mindset measures may play an important role. The scale items in my mindsets of mental illness measure were worded in such a way that I was asking participants to evaluate the extent to which they believe a certain type of person (i.e., a person with mental illness) can change. In contrast, other measures, such as the mindsets of weight measure which was used in the studies central to the development of the double-edged sword model, ask participants to evaluate the extent to which they believe an attribute is changeable. The difference between person-focused and attribute-focused wording becomes clear when the comparing the following items: “Even if they want to, people with mental illness cannot change their mental condition” versus “Body weight is something about people that they can’t change very much.” I suggest that this semantic difference may undergird important differences in attributions of blame. It would be interesting and potentially informative to examine what happens in the case of parallel language. For example, would the double-edged sword model hold if the items in the mindsets of weight measure were framed to emphasize a certain type of person (e.g., people who are overweight/obese)? Alternatively, what would have happened had I emphasized attributes in my mindsets of mental illness measure (e.g., mental illness is something about people that they can’t change very much). A recent study provides a thought-provoking example of exactly how important the semantics of mindset measures might be, particularly in the context of mental illness.

Smith (2019) conducted a study to examine how people’s mindsets regarding the emotion-regulation ability of others (i.e., individuals’ beliefs about the extent to which other

people can control and/or change their emotions) impacted their cognitive, affective, and behavioral responses to a hypothetical distressed individual. As such, participants were first given a brochure about depression and then proceeded to read a vignette describing a woman who was clearly exhibiting symptoms of depression. Participants subsequently completed a survey assessing their mindsets and responses to the individual in the vignette. Ultimately, results revealed that endorsing a stronger growth mindset (i.e., believing more strongly that others could control/change their emotions) was associated with more negative responses (i.e., blame, annoyance, and avoidance) and fewer positive responses (perspective taking, empathic concern, and support) towards the individual from the vignette (Smith, 2019). Of greatest interest to the current work is that the mindset measure used in this study emphasized an attribute (emotion regulation ability). I am curious as to what the results would look like if the type of person had been emphasized and the attribute was made secondary (e.g., “If they want to, people with depression can change or control their emotions.”). The notion that person-focused wording could systematically lead to more benign attributions (i.e., less blame) is not unfounded when we consider that growth mindsets of personality/people have consistently been demonstrated to promote making more process-focused, rather than trait-focused, judgments of others (Chiu et al. 1997; Dweck et al., 1995; Molden & Dweck, 2006).

In addition to the potential impact of wording in mindset measures, I suggest that differences in the perceived social acceptability of stigma for certain conditions may also help account for my findings. More specifically, I posit that blaming and, in turn, expressing prejudice toward people who are overweight/obese may be perceived to be more socially acceptable compared to blaming and expressing prejudice towards people with mental illness. These

differences in perceptions of stigma acceptability may stem from the societal narratives surrounding these conditions particularly in regard to their causes and treatment.

For example, we are consistently bombarded with messages that depict being overweight or obese as the result of making poor choices in terms of eating and exercising behaviors: people do not eat enough fruits and vegetables, people eat too many highly processed foods, people do not exercise enough, people sit too much, etc. Furthermore, we are led to believe that the treatment for such a condition lies within the individual themselves – they need only make a change to their lifestyle (i.e., eat less/better and exercise more). In other words, the societal narrative is one of personal choice, personal consequence, and personal redemption (Crandall & Martinez, 1996; Crandall & Schiffhauer, 1998). However, the societal narrative surrounding mental illness is vastly different. Trying to offset decades of past narratives in which it was commonly assumed that mental illness was the result of internal factors such as a ‘weakness of character’ (Brockington et al., 1993; Corrigan et al., 1999, 2000, 2003; Link et al., 1999), clinicians, media sources and individuals with and without mental illness today tend to point to externally-based factors as the primary cause of mental illness (Carter et al., 2018; Deacon, 2013; Harrington, 2019; Lebowitz & Appelbaum, 2019; Luderer & Böcker, 1993; Pescosolido et al., 2010; Read et al., 2015; Schroder et al., 2020). Specifically, they identify biological factors such as a chemical imbalance in the brain, psychosocial factors such as a past traumatic experience or stressful life events (e.g., toxic work environment), or some combination of the two – a pattern that was reflected in participant responses to the open-ended question regarding causality in Study 2. I suggest that these externally-oriented causal attributions reflect an underlying notion that mental illness chooses you, so to speak – not the other way around. Complementary to this emphasis on external causality are the messages we receive regarding treatment. That is,

treatment messages center around the notion that ‘people with mental illness need help’ and this ‘help’ necessarily involves some form of external aid – namely, medication, sessions with a therapist, or a combination of the two. In this sense, responsibility to improve the condition does not rest on the shoulders of the afflicted individual alone. This starkly contrasts with the narrative surrounding obesity which can be surmised as ‘did it to yourself, undo it to yourself’. I suggest that the internalization of these powerful societal narratives might inform people’s perceptions about the degree to which it is acceptable to blame and express prejudice against others.

Across studies 1 and 2, I conducted a series of exploratory analyses in the hopes of better understanding the negative link between growth mindsets of mental illness and attributions of blame. More specifically, as a plethora of research indicates that people who suffer from a mental illness or experience symptoms of psychopathology themselves as well as those who know someone else who has a mental illness tend to exhibit less stigma towards the mentally ill (Alexander & Link, 2003; Clement et al., 2012; Corrigan et al., 2001, 2002; Holmes et al., 1999; Link et al., 1987; Penn et al. 1994; see Corrigan et al., 2012 and Mehta et al., 2015 for review), I began by examining the associations between personal experience with mental illness and contact with others with mental illness and prejudicial attitudes. In Study 1, I operationalized personal experience as having a formally diagnosed mental illness and contact with others with mental illness as knowing one or more other persons with a mental illness. In Study 2 I included additional measures to more comprehensively assess both factors. Specifically, in addition to inquiring about formal mental illness diagnoses to tap into personal experience, I had participants complete the DASS-21 to assess the extent to which they had recently experienced symptoms of psychological distress (i.e., stress, anxiety, and depression). Further, instead of simply asking participants how many close others they knew who had a mental illness in an open-ended

fashion, I used Alexander & Link's (2003) contact questionnaire which taps into three types of contact (i.e., contact with close others who have been hospitalized for mental illness, contact through a work environment, and contact with strangers in public). However, despite my efforts to use a more comprehensive measure of contact with others, I was constrained to only using the assessment regarding whether or not participants have close others in their lives who have been hospitalized for a mental illness for my analyses. Ultimately, the results of bivariate correlational analyses across both studies confirm the notion that people with personal experience with mental illness and those who have relationships with close others with mental illness tend to exhibit less prejudice towards those with mental illness.

Following this, I conducted moderation analyses to examine if these two variables – personal experience and contact with close others – might moderate the negative link between mindsets and attributions of blame. In terms of personal experience, findings across both studies indicated that having a formal mental illness diagnosis did not moderate this link. However, recent symptoms of psychological distress did. Based on these findings, I suggest that the impact of personal experience on blame may be contingent on the recency of that experience. For example, I asked if participants had *ever* been diagnosed with a mental illness. This effectively means that participants who experienced mental illness at *any period of time* in their life – childhood, adolescence, young adulthood, middle age, etc. – answered affirmatively. In contrast, with current symptoms, I captured participants who had experienced symptoms of psychological distress in the *past two weeks*. It is entirely possible that individuals who have recently experienced symptoms of psychological distress might have a particularly keen appreciation for the challenges such symptoms present and thus feel more sympathy towards those with mental illness. As a result, they may tend to exhibit less blame. In contrast, sympathy towards

individuals with mental illness may wane as an individual's own experience with mental illness and/or symptoms of psychological distress becomes an increasingly distant memory. If this is the case, it would make sense that history of diagnostic status would lose predictive power. In terms of contact with close others, I found no evidence of moderation.

In terms of contact with others, I found no evidence of moderation. These null findings are surprising as they contrast with the results of previous work suggesting that having contact with others with mental illness can aid in reducing negative attitudes and increasing positive attitudes towards the mentally ill (e.g., Alexander & Link, 2003). It is clear that more work needs to be done to better understand the true role of contact with others, especially as increasing people's exposure to individuals with mental illness is often identified as an important mechanism for stigma reduction and thus an ideal component of interventions (Corrigan & Penn, 1999; Corrigan et al., 2001, 2002, 2012; Couture & Penn, 2003; Pettigrew & Tropp, 2000; Reinke et al., 2004). I posit that garnering this critical understanding may require creating new means of measurement to more effectively tap into different types of contact with others.

Although confidence in my overall findings is reinforced by their general replicability across two studies, there are a few notable limitations to my work. I address these in the following section and offer suggestions for future research in this area.

### **Limitations and Future Directions**

One key limitation to the current work is that I examined mediational and moderation effects using data from studies employing cross-sectional correlational designs (Fairchild & McDaniel, 2017; Maxwell & Cole, 2007). Conducting such analyses necessarily presumes causal links. Despite a sound theoretical foundation, my ability to verify causality is limited without use of an experimental design. Future research should seek to replicate these findings in an

experimental context. Additionally, I cannot be certain that my mediators are, in fact, the only genuine mediators of the observed relationships (Fielder et al., 2011).

Second, the terminology included in key measures of my survey was intentionally broad. That is, rather than asking participants about their beliefs about and attitudes towards individuals with specific mental illnesses such as depression or schizophrenia, I asked them about these beliefs about and attitudes towards ‘individuals/people with mental illness/the mentally ill’ as a whole. Furthermore, I chose not to define ‘mental illness’ itself at any point. I took this ambiguous approach because I thought it would encourage participants to draw more heavily on their naturally occurring associations with mental illness, which would in turn elicit their most potent attitudes and beliefs. However, I readily acknowledge that it is feasible that people might think about specific mental illnesses (schizophrenia) and/or clusters of related illnesses (e.g., mood disorders) as being highly distinct from one another. As such, they may not hold the same malleability beliefs about nor attitudes towards each one. With this in mind, it is possible that patterns of effects would differ across specific mental illnesses and/or clusters of illnesses. Future research should seek to investigate the relationship between mindsets and stigma-related outcomes across a variety of specific illnesses and/or clusters.

Additionally, in the current work I homed in on the impact of mindsets on prejudice towards the mentally ill – an attitudinal aspect of stigma. While this focus has provided important insight, I suggest that future work also include a behavioral assessment as prejudicial attitudes often serve as a precursor to discriminatory behavior. For example, researchers might conduct a study involving interactions between a participant and an individual identified as suffering symptoms of or having a formally diagnosed mental illness. Including such an assessment would provide vital information regarding the interpersonal implications of mindsets

of mental illness in more real-world settings. Furthermore, given my findings related to mindsets and prognostic pessimism, it would also be beneficial for future research to explore how this plays out in more tangible ways as there are likely important downstream behavioral implications. For example, it's easy to imagine that someone who doesn't believe mental illness is particularly treatable may be less inclined to do things such as donate to local or national organizations dedicated to improving mental health or to sign a petition to insurance companies demanding that they provide equal coverage for both physical and mental health conditions. In light of this, it will be important for future work to distill the relationships between mindsets of mental illness, attitudes, and behavioral outcomes.

My preliminary work in this area indicates that cultivating growth-oriented beliefs about mental illness may offer a highly practical intervention avenue for stigma reduction. Yet, there is much research to be done to help determine what exactly such an intervention should entail. First and foremost, it will be necessary to explore how best to craft a message that emphasizes the malleable nature of mental illness. Previous work suggests that biological explanations can promote the idea that a condition is relatively unchangeable, in other words, a fixed mindset (Dar-Nimrod & Heine, 2011; Dietrich et al., 2006; Haslam, 2011; Haslam & Kvaale, 2015; Lebowitz & Ahn, 2014; Lebowitz et al., 2013; Read, 2007). Given that there has been a shift towards providing biogenetic explanations of mental illness as the medical or disease model increases in popularity (Deacon, 2013; Pescosolido et al., 2010; Whitaker, 2005), future research will need to find ways to offset the fixedness such an etiological explanation may be perceived to imply. Two approaches that have shown promise in recent work on depression involve highlighting the importance of gene by environment interactions (i.e., epigenetics) in the manifestation of mental illness and emphasizing the highly neuroplastic nature of the human

brain (Lebowitz et al., 2013; Lebowitz & Ahn, 2015, 2018). Upon gaining an understanding of what message content is effective in general, it will then be important to determine how much tailoring is necessary. Does each mental illness or cluster of related illnesses require its own message? Or will a one-size-fits-all approach be equally effective? Secondly, in addition to research related to mindset message content, it will also be important to identify what medium is best for delivering mindset messages. Consistent with the approach used in previous mindset research in other domains (Burnette, 2010; Hoyt et al., 2017, 2019; Orvidas et al., 2018; Thomas et al., 2019), should a *Psychology Today* style news article be used to manipulate individual's beliefs? Or would it be more effective to use a short video (e.g., Crum et al., 2013)? Perhaps a combination of the two? Beyond message content and delivery medium, we recommend that any future intervention research employ longitudinal designs that include both attitudinal and behavioral assessments in order to evaluate the longevity and real-world impact of intervention effects. Doing so will help determine the dosage necessary to create more enduring and meaningful changes.

Finally, I conducted this work with the intent to examine the impact of individuals' mindsets of mental illness at the *interpersonal* level specifically. However, it is well established that mindsets critically influence outcomes at the *intrapersonal* level as well (Dweck, 2000; See Burnette et al., 2013 for review of the link between mindsets and self-regulation). For example, in their study examining the double-edged sword effect in the context of weight, Hoyt and colleagues (2017) found that mindsets of weight were not only associated with anti-fat attitudes towards others but also with personal body shame. Additional studies suggested that these weight mindsets also impact eating disorder risk and engagement in unhealthy weight control behaviors (Hoyt et al., 2019). It is easy to imagine that people's mindsets of mental illness might impact an

array of outcomes central to their own mental health and well-being such as perceptions of self-worth, symptoms of psychopathology, treatment seeking and adherence behaviors, etc. As such, I suggest that future work seek to broaden our understanding of the impact of mindsets of mental illness by extending outcomes of interest to include those at the intrapersonal level.

### **Conclusion**

In sum, the findings of the current work suggest that the double-edged sword model does not readily replicate within the domain of mental illness. Rather, cultivating growth-oriented beliefs about mental illness may reduce prejudice by decreasing both blame attributions and essentialist thinking. However, more work is still needed to examine both the benefits and potential costs of using a mindset-based approach to reducing the stigma attached to mental illness. I hope that other researchers will continue to build off of my initial work to develop and test such interventions.

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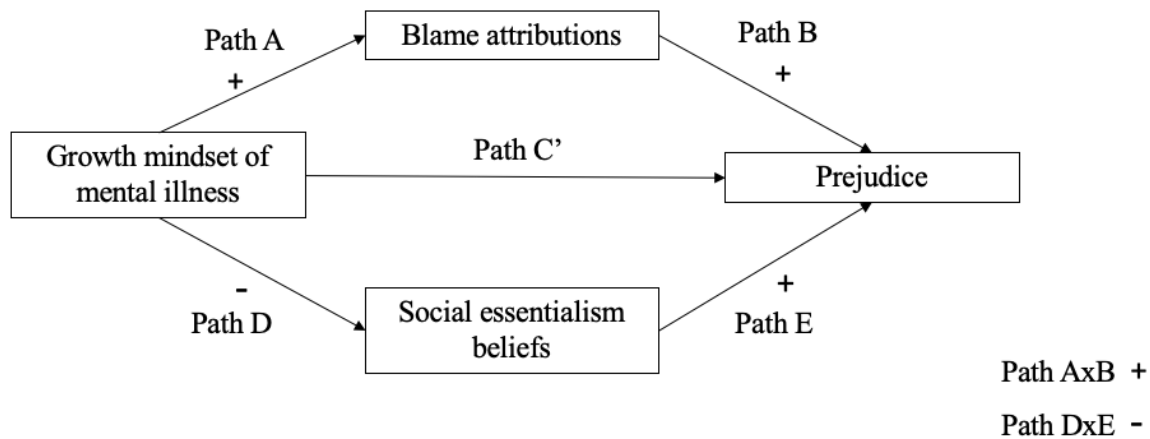
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**Figure 1**

*Double-Edged Sword (DES) hypothesized model*



**Table 1***Study 1: Frequency of diagnosed mental illnesses (n = 107)*

Disorder	<i>n</i>	%
Depression	66	61.7%
Anxiety	65	60.8%
PTSD	18	16.8%
Bipolar	14	13.1%
OCD	12	11.2%
ADHD	9	8.4%
Panic	6	5.6%
Personality disorder	4	3.7%
Schizophrenia	2	1.9%
Other	2	1.9%

*Note.* PTSD = Post Traumatic Stress Disorder, OCD = Obsessive Compulsive Disorder, ADHD = Attention-Deficit Hyperactivity Disorder.

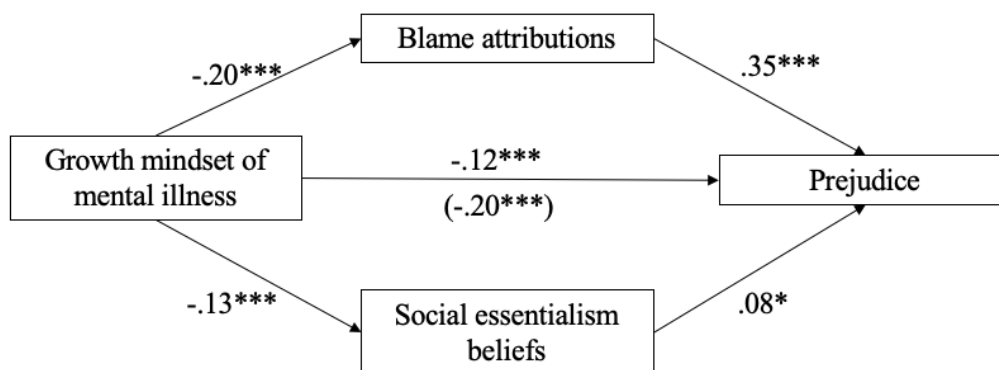
**Table 2**

*Study 1: Means, standard deviations, reliabilities, and correlations between scales (N = 328)*

Variable	<i>M</i>	<i>SD</i>	$\alpha$	1.	2.	3.	4.
1. MMI	4.46	1.51	.91	-	-	-	-
2. Blame	2.11	1.21	.93	-.25***	-	-	-
3. Ess	3.73	1.03	.78	-.19***	.40***	-	-
4. Prej	3.10	.85	.93	-.35***	.58***	.33***	-

*Note.* MMI = mindsets of mental illness, Blame = blame, Ess = essentialist beliefs about mental disorders, Prej = prejudice.

\*\*\*  $p < .001$ .

**Figure 2***Study 1: Mediation model results*

Indirect Blame:  $B = -0.07$ , 95% CI  $[-0.11, -0.04]$

Indirect SE:  $B = -0.01$ , 95% CI  $[-0.03, 0.001]$

*Note.* Total effect is in parentheses. SE = social essentialism beliefs.

\*  $p < .05$ . \*\*\*  $p < .001$ .

**Table 3***Study 2: Frequency of diagnosed mental illnesses (n = 99)*

Disorder	<i>n</i>	%
Anxiety	79	79.8%
Depression	76	76.8%
ADHD	21	21.2%
PTSD	14	14.1%
OCD	11	11.1%
Bipolar	9	9.1%
Eating disorder	6	6.1%
Personality disorder	2	2.0%
Schizophrenia	2	2.0%
ASD	2	2.0%
Other	3	3.0%

*Note.* PTSD = Attention-Deficit Hyperactivity Disorder, Post Traumatic Stress Disorder, OCD = Obsessive Compulsive Disorder, ASD = Autism Spectrum Disorder.

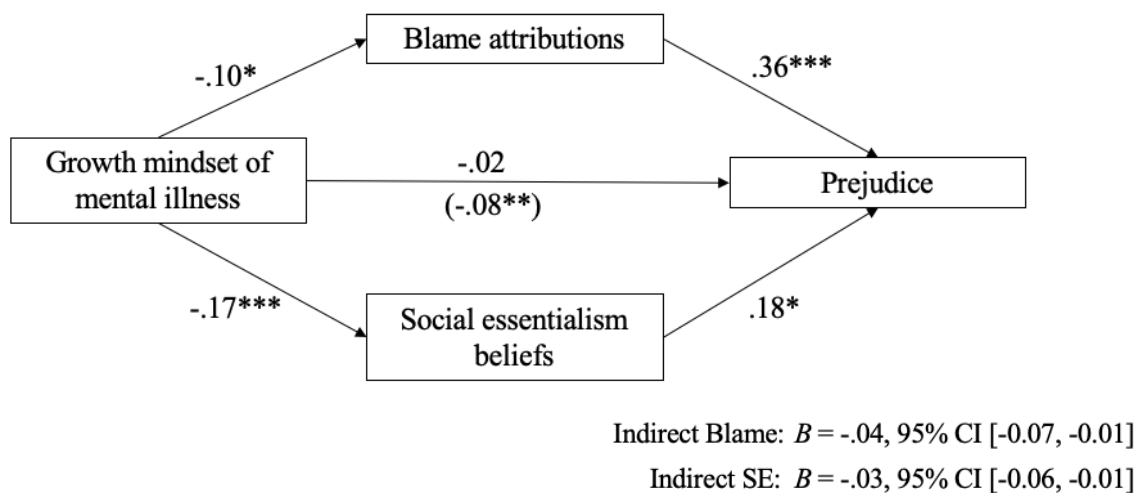
**Table 4**

*Study 2: Means, standard deviations, reliabilities, and correlations between scales (N = 343)*

Variable	<i>M</i>	<i>SD</i>	$\alpha$	1.	2.	3.	4.	5.	6.	7.	8.
1. MMI	4.51	1.50	.92	-	-	-	-	-	-	-	-
2. Blame	2.07	1.11	.92	-.13*	-	-	-	-	-	-	-
3. Ess	3.66	.95	.75	-.27***	.35***	-	-	-	-	-	-
4. Prej	2.98	.84	.94	-.15**	.56***	.38***	-	-	-	-	-
5. PrgPes	2.11	.84	.74	-.33***	.15**	.05	.22***	-	-	-	-
6. Diag	NA	NA	NA	.12*	-.22***	-.17**	-.32***	-.18***	-	-	-
7. DASS	13.68	12.78	.95	-.04	.12*	-.002	-.16**	-.03	.38***	-	-
8. Indirect	NA	NA	NA	.01	-.04	-.05	-.10	.03	.18***	.23***	-

\**Note.* MMI = mindsets of mental illness, Blame = blame attributions, Ess = essentialist beliefs about mental disorders, Prej = prejudice, PrgPes = prognostic pessimism, DASS = current symptoms of stress, anxiety and depression, Diag = presence of mental illness diagnosis (coded as 0 = no diagnosis, 1 = diagnosis), Indirect = presence of indirect experience with mental illness in the form of having close others previously hospitalized for mental illness (coded as 0 = having none, 1 = having one or more).

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

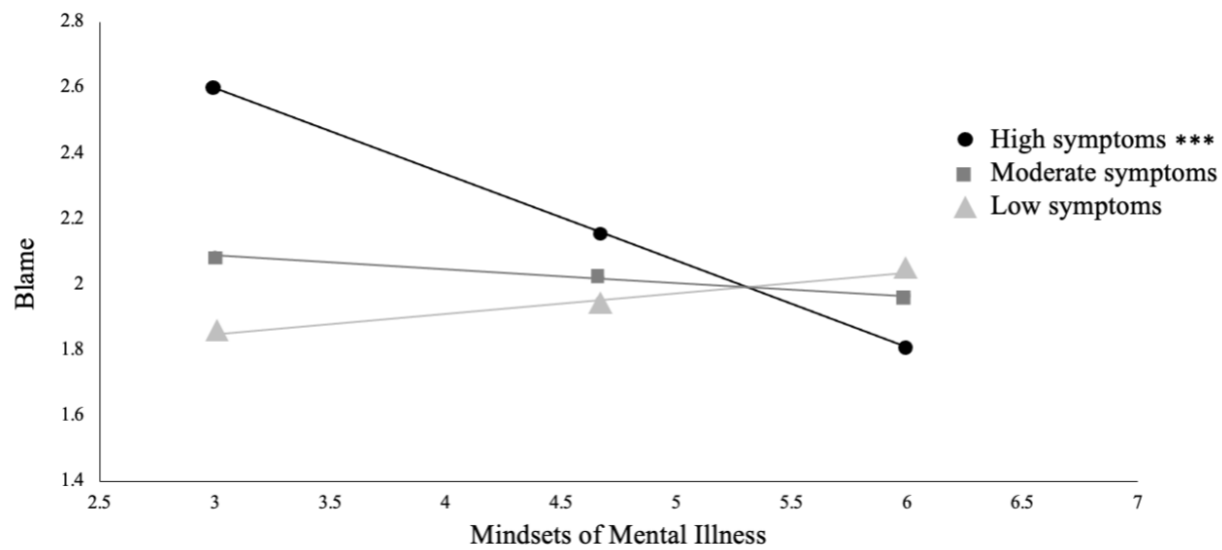
**Figure 3***Study 2: Mediation model results*

*Note.* Total effect is in parentheses. SE = social essentialism beliefs.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

**Figure 4**

*Moderation by recent symptoms of psychological distress*



\*\*\* $p < .001$ .

## CHAPTER 5 | INTEGRATIVE REVIEW

Once conceptualized simply as the absence of mental illness, the term mental health is now understood to mean being in a state of emotional, psychological, and social well-being (WHO, 2001). More concretely, individuals in good mental health are able to engage in activities that are productive and contribute to broader society, maintain healthy social relationships, cope with the adversity of everyday life stressors and adapt to change. Not surprisingly, mental health is intimately linked to perceptions of life satisfaction (Lombardo et al., 2018; Rissanen et al., 2013), which itself is linked to a myriad of positive life outcomes such as greater job success (Boehm & Lyubomirsky, 2008), fewer physical health problems (Diener & Chan, 2011), and greater overall longevity (Diener & Chan, 2011; Wiest et al., 2011) to name a few.

In light of these relationships, identifying factors that affect mental health is a critical endeavor for researchers. The manuscripts included in this dissertation advance our understanding of how one individual level factor, namely, mindsets, can serve to both jeopardize and promote mental health. In the following sections, I summarize the findings of each manuscript, discuss their theoretical and practical implications, and suggest directions for future research in this area.

### Summary of Findings

In the first manuscript (Babij et al., 2019), I examined how mindsets of negative emotions (i.e., beliefs regarding the extent to which experiencing negative emotions is enhancing or debilitating) related to affective and behavioral coping responses following a personal setback. In Study 1, a correlational study, stronger negative-emotion-as-enhancing mindsets were associated with experiencing less severe negative emotions and engaging in more mastery-oriented behavioral strategies. In Study 2, an experimental study, we randomly assigned

participants to a negative-emotion-as-enhancing or negative-emotion-as-debilitating condition and manipulated mindsets using both a *Psychology Today* news style article and short video which depicted the negative emotions experienced during a setback as either helpful or harmful to motivation and achievement. Although we successfully manipulated mindsets, mindset condition did not predict either emotional severity or behavioral strategy use as expected. However, when using self-reported mindsets of negative emotion, rather than condition as the predictor, the pattern of findings from Study 1 replicated. With these two studies we provided initial evidence of a relationship between the way people perceive experiencing negative emotions (i.e., enhancing vs. debilitating) and their affective and behavioral coping responses in the context of a setback.

In the second manuscript (Burnette et al., 2020a), across two correlational studies, we examined how mindsets of self-regulation ability (i.e., beliefs regarding the potential to change and develop the ability to self-regulate) related to coping with setbacks as well as two indicators of mental illness (i.e., severity of executive functioning deficits and ADHD diagnosis). Results from both studies indicated that growth mindsets of self-regulation ability were associated with more adaptive coping in the wake of setbacks (i.e., experiencing less severe negative emotion, remaining optimistic about achieving goals in the future, and using fewer avoidant self-regulatory strategies). While this relationship was not moderated by either indicator, we did find that growth mindsets were negatively correlated with the severity of executive functioning deficit and ADHD diagnostic status. Overall, findings from this manuscript indicate that growth mindsets of self-regulation ability promote more adaptive affective, cognitive, and behavioral coping in the wake of setbacks. Furthermore, individuals with disorders of self-regulation may be less likely to endorse such mindsets.

In the final manuscript, I explored how people's mindsets of mental illness (i.e., people's beliefs about the ability of individuals with mental illness to change their condition) inform their attitudes towards the mentally ill. More specifically, across two large correlational studies, I examined the relationships between mindsets of mental illness, attributions of blame, social essentialist thinking, and prejudice against the mentally ill. Results indicated that endorsing stronger growth mindsets of mental illness predicted less prejudice via the mediating effects of decreased blame attributions and reduced social essentialist thinking. Furthermore, exploratory analyses revealed that the link between mindsets and blame attributions depends on an individual's personal experience with mental illness. Ultimately, these studies not only demonstrate that mindsets about mental illness have important effects at the interpersonal level, but they also suggest that a mindset-based intervention may offer an avenue for stigma reduction.

### **Implications**

This body of work contributes to the relatively nascent area of research applying the mindset framework to the mental health domain by showing that individuals' beliefs about different attributes, abilities, experiences and conditions matter for mental health-related outcomes at both the intra and interpersonal levels. For example, the findings of the first and second manuscripts provide evidence that individuals endorsing growth mindsets are less likely to experience severe negative emotions in the wake of a setback. In this sense, growth mindsets can be thought of as a buffer against experiencing intense negative emotions – a buffer against an immediate threat to one's sense of well-being. Additionally, the third manuscript demonstrates that individuals' mindsets matter for the process of person perception, informing attitudes towards others in important ways. These attitudes, in turn, likely have downstream implications for behavior (e.g., discrimination).

Furthermore, the current work also adds to the broader mindset literature by identifying key mechanisms underlying the link between mindsets and outcomes related to mental health. Specifically, drawing on attribution theory and the literature surrounding essentialist thinking, the third manuscript demonstrates that the link between mindsets and prejudicial attitudes is mediated by attributions of blame and social essentialist beliefs.

In addition to the above theoretical implications, there are important practical implications of this body of work. More specifically, the finding in the second manuscript that individuals who more regularly experience difficulty with self-regulating (i.e., those with more severe executive functioning deficits and/or an ADHD diagnosis) are less likely to endorse a growth mindset of self-regulation ability tentatively suggests that certain groups may be in greater need of receiving mindset-based interventions. This point should be carefully considered by those responsible for funding, developing, and implementing such interventions. Furthermore, the finding in the third manuscript that cultivating growth-oriented beliefs about mental illness may produce benefits (i.e., reducing prejudice by decreasing both blame attributions and essentialist thinking) without incurring significant costs highlights the possibility and practicality of utilizing a mindset-based intervention approach to stigma reduction. Organizations and institutions engaged in anti-stigma efforts can capitalize on this information to shape the public health messages they create and share as part of their campaigns.

### **Future Directions**

Although the current work provides important insights into the relationship between mindsets and mental health-related outcomes, there is much yet left to explore. For example, with few exceptions (e.g., Schroder et al., (2019a, 2019b) and De Castella et al.'s, (2014, 2015) work regarding individuals with diagnosed anxiety and social anxiety disorders) the vast

majority of the current research in this area has been conducted with non-clinical samples. Although these samples undoubtedly provide invaluable insight about how mindsets are linked to mental health-related outcomes for a large portion of the population, the same patterns may not hold true for clinical populations. As such, future work should seek to conduct research with clinical populations, which should include both people who have formally diagnosed mental illnesses as well as those who have recently experienced/are currently experiencing symptoms of psychopathology but do not necessarily have a formal diagnosis.

Second, future research should seek to conduct studies to advance our understanding of the relationship between mindsets and mental health-related outcomes like stigma by investigating people's beliefs about the traits and abilities of individuals with specific types of mental illnesses. In the third manuscript of this dissertation, we investigated people's beliefs about individuals with 'mental illness' broadly construed. As acknowledged in the limitations section of that manuscript, it is entirely possible that people make important distinctions between specific disorders or clusters of disorders. It follows that their beliefs about individuals' traits and abilities may vary according to disorder and this may produce systematic differences in outcomes (e.g., more prejudicial attitudes via increased attributions of blame). Unveiling the beliefs related to specific disorders or clusters of disorders, especially those that are most commonly experienced and/or often depicted in popular culture (e.g., schizophrenia) will be a vital step in determining how societal narratives around these illnesses can be shifted.

Third, there is much work to be done in terms of understanding how to optimize the design and implementation of mindset-based interventions aimed at promoting mental health. As evidenced by the first manuscript in this dissertation as well as other studies in the area (e.g., Kneeland et al., 2016a, 2016b; Schleider & Weisz, 2016, 2018; Wilson, 2019), relevant mindsets

(e.g., mindsets of negative emotions, mindsets of emotion-regulation ability, mindsets of personality, etc.) can be manipulated using brief one-shot interventions. However, several important questions remain. For example, when are standard growth messaging approaches versus compensatory-growth messaging approaches warranted? The third manuscript suggests that a standard growth message may be suitable when targeting mindsets of mental illness in the context of stigma reduction efforts. But this may not always be the case. How, if at all, should intervention messages aimed at clinical versus non-clinical populations differ? What is the best delivery mechanism for these messages (e.g., written article or video)? Who should deliver them (e.g., scientist, clinician, celebrity, afflicted individual)? Relatedly, once more is known about intervention design and best practices for implementation, research efforts aimed at evaluating the effectiveness of these interventions should be undertaken. As mindset-based interventions are increasingly being considered as a viable treatment option (whether alone or as one component of a more comprehensive approach) by clinicians (see Schroder, 2021 for review), it will be especially important to evaluate how effective they are in real-world settings.

### **Conclusion**

The three manuscripts included in this dissertation examine the link between mindsets and mental health. Overarchingly, results indicate that holding a growth mindset promotes positive outcomes related to mental health at both the intrapersonal level (e.g., experiencing less severe negative emotions in the wake of a setback) as well as the interpersonal level (e.g., reduced prejudice). That is, the work in this dissertation provides empirical support for the notion that our mindsets - our beliefs about the malleability of a trait, ability, condition or experience - matter in terms of informing our coping responses as well as our judgments about others. In addition, it illustrates the potential utility of using a growth mindset-based approach for mental

health and well-being related interventions and suggests several pertinent directions for future research in this burgeoning field.

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**APPENDICES**

## Appendix A

### Negative Emotion Appraisals Measure

1	2	3	4	5	6	7
Strongly Disagree			Neither Agree nor Disagree			Strongly Agree

*Please rate the extent to which you agree or disagree with the following statements:*

1. The effects of negative emotions are debilitating. **(R)**
2. Experiencing negative emotion facilitates learning.
3. Experiencing negative emotion depletes my motivation. **(R)**
4. Experiencing negative emotion enhances my ability to reach my goal.
5. Experiencing negative emotion inhibits my ability to grow as a person. **(R)**
6. Experiencing negative emotion debilitates my motivation. **(R)**
7. Experiencing negative emotion hinders my ability to reach my goal. **(R)**
8. The effects of negative emotion are enhancing.

## **Appendix B**

### Leader Information Packet

Your leadership task is to deliver instructions to your two followers on how to complete a selection/resume-screening task. Your followers are assuming the role of resume screeners, and you should assume the role of Recruitment Manager for Amidex Corporation.

Only you, as the leader, will receive the instructions for how to complete the task. You will deliver the instructions to your followers via a web cam, which is broadcasting to the other two group members who are online right now. Video conferencing, web chats, and other methods of computer-mediated-communication are becoming increasingly popular in American businesses.

Because of this one-way communication, your followers will not be able to ask questions, and you will not be able to solicit feedback from them. For these reasons, it is important that you are very detailed in your instructions. After listening to you, the two followers will complete the task. Additionally, due to the high correlation between task performance and quality of instruction, their performance on the task will be evaluated by a third-party observer. This will serve as an objective measure of your leadership performance. You will receive this feedback objective score as well as a subjective score and written feedback from both followers evaluating your leadership performance.

In this packet, you will find the following documents:

- 1) Organizational background
- 2) Information on your role
- 3) Instructions for the task

## **Organization Background**

Amidex is a multinational organization that manufactures and distributes pharmaceuticals. It employs about 50,000 people worldwide – its top managers are mostly White males. Amidex has announced openings for college graduates in its management training program. It is seeking high potential graduates to be trained for placement in management positions. Any major is appropriate because the training program will be tailored to the interests, aptitude, and work experience of each trainee.

Historically, the Amidex training program has attracted and recruited applicants who have excellent academic achievement records. However, in emphasizing academic accomplishments, the organization has rejected applicants who are not academic stars but who have demonstrated leadership in other areas. The organization has now decided that it wishes to retain a more diverse workforce by recruiting individuals who have demonstrated competency across a wide range of areas. There has been some conflict within the organization about this issue. Some detractors see it as an opportunity to increase the number of minorities in the organization, regardless of how competent they are for the positions. Further, Amidex is in a conservative business. Detractors within the organization believe Amidex could lose their clients if they adopt this new approach to recruitment. However, supporters of the new approach to recruitment emphasize the benefits of recruiting people from diverse backgrounds. Organizations that value diversity are more innovative than their conservative competitors. Amidex is trailing behind their competitors and some senior executives believe this is due to the organization's reluctance to move with the times. Further, the demographic composition of the American Labor force is changing as the proportions of both women and members of minority groups have steadily increased in recent years. Some senior executives believe that Amidex employees will

not be effective at their jobs unless they acquire skills in dealing with culturally different co-workers whom they work with, work for, and supervise.

To achieve the new objective of the organization, Amidex have recruited a number of undergraduates to help identify candidates for their management training program. Other successful organizations have recruited undergraduates to help with recruiting efforts. Students appear particularly adept at identifying applicants with diverse interests, values and personalities.

### **Information about Your Role**

You joined Amidex 5 years ago and your promotion to Recruitment Manager is a recent event. You joined the organization through its management training program and feel proud that you are in charge of a program that gave you such valuable training and experience. In fact, you believe that without that training you would not have gained such an early promotion. All the usual personnel services such as recruitment, hiring, promotions, training, and contract negotiations are handled through your office. You are in charge of 15 people, 3 of whom were recruited through the management training program.

### **Task Instructions**

The goal of this task is for you to deliver instructions to your two followers on how to complete a selection/resume-screening task. Your two followers will view you give your instructions on their own computers via broadcast.

Your followers have each been given a set of 4 resumes and evaluations sheets and need instructions on how to screen the resumes. In addition, you want the recruiters to write a short letter to their top applicant persuading them to join the organization. The followers will have 10 minutes to complete the task. The resumes are from undergraduate students from other

universities. As the recruitment manager, you are required to give clear instructions to the undergraduate recruiters on how to perform the task.

Although the applicant should have a BA/BS by May 2012, the primary concern should be to hire employees whose background suggests they will be effective managers. The undergraduate recruiters need to review each resume to judge whether the applicant meets the requirements. On the evaluation sheet is a list of dimensions. The undergraduate recruiters need to evaluate each applicant on the set of dimensions and provide comments on how the applicant fits or does not fit the dimension. The evaluation sheet contains ratings (on a 1 –7 scale) and space for the recruiters to record evidence of how each applicant has demonstrated or failed to demonstrate achievement in this area. Recruiters also need to provide a general evaluation of the candidate.

The dimensions stated on the evaluation sheet include:

- 1) Willingness to work hard (going beyond the minimum required)
- 2) Innovation (looks for new challenges)
- 3) Cooperation (working well with others)
- 4) Leadership potential (influencing others effectively)
- 5) Versatility (able to adapt to different situations)

Most candidates will have little work experience, so the recruiters need to look for evidence in the college and outside activities of the applicant. Recruiters also select the top two people they feel are most eligible for the management training program. Recruiters should only choose the top two once they have rated all the applicants. The training program is extremely expensive and care needs to be taken in selecting the right applicants for the positions. Then they write a brief letter to the top candidate persuading them to join the organization.

Now prepare your talk for the undergraduate recruiters. Imagine that you have entered the room where the undergraduate recruiters are seated. You need to give actual instructions and guidance to your followers, although you are unable to see them.

## Appendix C

### Failure Feedback Form

Your followers performed **BELOW** average, scoring in the **61<sup>st</sup>** percentile of those who have participated in this task as followers.

#### Follower Task Performance Review:

Criteria	Follower 1	Follower 2
# of screenings completed	4 of 4 -----100%	2 of 4 -----50%
Errors (# of screened applicants approved who did not meet qualifications)	1	0
Selected top 2 applicants	1 of 2 -----50%	0 of 2 -----0%
Completed letter to chosen top applicant	0 of 1 -----0%	0 of 1-----0%
<b>Overall follower performance percentile</b>	<b>62<sup>nd</sup> percentile</b>	<b>60<sup>th</sup> percentile</b>

You scored **BELOW** average, scoring in the **63<sup>rd</sup>** percentile of those who have participated in this task as a leader.

#### Follower Ratings of Leader Instructions (*scale of 1(very poor) – 7 (excellent)*):

Criteria	Follower 1	Follower 2
Clarity of instruction	3	3
Consistency of instruction	2	2
Helpfulness of instruction	4	3
Confidence in giving instruction	3	3
<b>Average performance rating:</b>	<b>3</b>	<b>2.75</b>
<b>Overall performance rating percentile</b>	<b>63<sup>rd</sup> percentile</b>	

#### Additional comments from Followers:

*Follower 1:* It seemed like they were trying hard to help, but it wasn't exactly clear how we were supposed to evaluate the resumes. For example, I didn't understand the instructions they gave about the ratings at all. And, they were not a very good speaker.

*Follower 2:* I had a hard time following what they were saying. Sometimes one instruction contradicted the other one. I think they needed to tell us what to do with more confidence.