



## Review

# Mindsets in the clinic: Applying mindset theory to clinical psychology



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## ABSTRACT

Beliefs about the malleability of attributes, also known as mindsets, have been studied for decades in social-personality psychology and education. Here, I review the many applications of mindset theory to clinical psychology and psychotherapy. First, I review social psychological and cognitive neuroscience evidence that mindsets and mindset-related messages are, to a large extent, focused on emotional tolerance. Specifically, the growth mindset, or the belief that attributes are malleable, encourages confronting and tolerating anxiety, frustration, and disappointment in healthy and adaptive ways that promote resilience, whereas the fixed mindset and related messages discourage the experience of these emotions and often leads to helplessness. Second, I review the emerging research on the anxiety mindset and discuss its relevance to clinical work. A model is proposed illustrating connections between mindsets, emotion regulation strategies, treatment preferences, and outcomes. Case examples are used to illustrate practical applications. I conclude that mindsets can inform psychotherapy, research, and public policy.

## 1. Introduction

Decades of research in social cognition indicate that factors other than cognitive abilities are relevant for successful performance in a variety of domains. Specifically, the research on mindsets (or implicit theories) – which refer to beliefs about the malleability of self-attributes – has revealed that these beliefs predict performance ranging from academic achievement to rebounding from interpersonal stressors (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013; Dweck, 2006). Mindsets have been traditionally studied in the social/personality and developmental/educational subfields of psychology. However, there is growing interest in applying mindsets to clinical psychology (Burnette, Knouse, Vavra, O'Boyle, & Brooks, 2020). Here, I expand upon this interest in three ways. I first review the evidence that the most commonly studied mindset – the intelligence mindset – is explicitly and implicitly tied to *internal attention to emotions*, a previously unacknowledged mechanism of action. Second, with this mechanism in mind, I discuss how mindset theory can inform clinical work drawing from the mounting empirical evidence and case examples. Third, I review the emerging literature on the anxiety mindset and its applications to the clinic, before discussing broader implications of mindset theory to the field of mental health.

### 1.1. Mindsets: An overview

Although the term “mindset” can refer to any of a number of related beliefs, attitudes, and cognitions, here I exclusively reserve the term for beliefs about the malleability of self-attributes (Dweck, 1999). At their core, these beliefs reflect whether or not an individual believes an attribute can change. These mindsets lie along a continuum, ranging from fixed/entity beliefs (the belief that attributes such as intelligence or personality are immutable) to growth/incremental beliefs (the belief that these attributes are changeable). Mindsets have been typically measured using self-report instruments, and a typical mindset questionnaire item is: “You have a certain amount of intelligence and there is really not much you can do to change it”; participants are asked to rate the agreement or disagreement on a six-point Likert scale (Hong, Chiu, Dweck, Lin, & Wan, 1999).

Mindset theory suggests the two mindsets are differentially correlated to goal orientations and responses following setbacks. For instance, growth-minded individuals typically endorse learning goals, in which the goal is to develop mastery of a new task (Grant & Dweck, 2003). In contrast, fixed-minded individuals typically endorse performance-oriented goals, in which the goal is to outperform others, regardless of developing competency and mastery (Dweck & Leggett, 1988). In part because of these differences in goal strivings, growth-minded

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individuals are more likely to expend additional effort in the service of developing mastery when setbacks occur. For instance, growth-minded students are more likely to take remedial action in the face of unsatisfactory performance feedback (Hong et al., 1999).

Three aspects of mindsets are relevant for an introduction in the present context. First, mindsets are thought to lie below the level of consciousness – which is why they are also referred to as implicit beliefs. This is important as below I suggest that certain messages and narratives can implicitly induce these beliefs without conscious awareness. Second, individuals hold mindsets of many attributes, including intelligence, personality, anxiety, morality, and writing ability, to name just a few. These mindsets appear to be domain-specific, meaning for example that the same individual can hold more of a fixed mindset of personality, and more of a growth mindset of intelligence (Dweck, Chiu, & Hong, 1995; Hughes, 2015; Schroder, Dawood, Yalch, Donnellan, & Moser, 2016). This domain specificity suggests that mindsets of a particular domain are more relevant for outcomes in that domain – school grades are more related to mindsets of intelligence than mindsets of emotion (Romero, Master, Paunesku, & Gross, 2014). Third, mindsets are *distal* predictors of outcomes, meaning there are a number of attributes, contexts, and processes that mediate and moderate the relationships between mindsets and outcomes (e.g., school grades). Therefore, meta-analyses tend to reveal small-to-medium effect sizes of direct correlations between mindsets and achievement outcomes (Burnette et al., 2013; Sisk, Burgoyne, Sun, Butler, & Macnamara, 2018).

Although mindsets have been examined in social/personality and educational settings, there is growing interest in understanding how mindsets relate to psychological distress (Burnette et al., 2020; De Castella et al., 2013; Kneeland et al., 2016; Schleider, Abel, & Weisz, 2015; Schroder, Dawood, Yalch, Donnellan, & Moser, 2015). This work has been helpful in quantifying the relationship between mindsets and distress, finding that the growth mindset is related to less psychological distress. However, there is still a question of the underlying mechanisms linking mindsets with clinical phenomena. The current paper offers some explanations. I begin with a brief review of typical interpretations of mindset mechanism, which has drawn heavily from attribution theory. I discuss the clinical applications of these interpretations before discussing how mindsets relate to emotional tolerance. Note that I am not claiming that emotional tolerance can fully explain mindset effects in every outcome domain; merely that emotional reactions to challenging experiences can be useful for understanding how mindsets operate and how clinical interventions can be designed to help individuals endorsing fixed mindsets overcome their distress.

## 1.2. Intelligence mindsets and cognitive interpretations

With respect to mindsets of intelligence – the most commonly studied mindset - Dweck and her colleagues have long focused on cognitive explanations for mindsets' relationships to outcomes. Such cognitive processes include attributions of success and failure, learning versus performance goals, and beliefs about effort (Dweck & Leggett, 1988; Dweck & Yeager, 2019). For instance, endorsements of the fixed mindset tend to correlate with 1) an attribution such as, "Failure means I'm not smart"; 2) performance-avoidance goals such as, "My main goal is to avoid looking dumb"; and 3) effort beliefs such as, "If I have to try hard it means I'm not smart" (Dweck & Yeager, 2019, but see Burgoyne, Hambrick, & Macnamara, 2020). In contrast, endorsements of the growth mindset tend to correlate with attributions of failure as not putting in enough effort, learning goals ("My goal is to develop mastery") and positive beliefs about effort ("effort is a key to success"). These processes are drawn from attribution theory, which suggests that performance differs depending on specific causal attributions of effort and success (Weiner, 1985).

There are certainly clinical applications that can be drawn from these attributions. From the fixed mindset perspective, the conceptual link between a behavior (e.g., making a mistake) and an immutable

character flaw ("I'm not smart") is at the ready. This attribution puts pressure on individuals to behave perfectly at all costs if they want to appear smart. Indeed, fixed mindsets of intelligence and personality are positively correlated with social anxiety, perfectionism, and depression (Burnette et al., 2020; Da Fonseca et al., 2009; Schleider et al., 2015; Schroder et al., 2015, 2016; Shih, 2011). Many adolescent and college-age clients present to therapy with motivational difficulties in school. Cognitive restructuring offers one way of addressing beliefs around effort and ability. Asking questions such as "How do you know putting in effort means you are not smart?" and "When did you learn to avoid effort?" can illuminate long standing core beliefs. Moreover, Dweck (1999) has found that fixed-minded students are more likely to equate their self-worth with their external achievements. A cognitive therapy approach to unlinking achievement from self-worth can be helpful toward finding a healthy sense of fulfillment in other domains.

## 2. Intelligence mindsets and emotional reactions

While these cognitive factors are certainly relevant and well-studied, one additional aspect that has received much less attention is the moment-to-moment experience of affect. Indeed, a close read of the mindset literature reveals that mindsets come with consistent messages and beliefs about the *willingness to experience uncomfortable emotions*, which I detail in the sections below. To briefly foreshadow, the fixed mindset of intelligence provides a meaning-making framework that elicits more negative emotional responses (anxiety, frustration, shame) during situations that require more effort. Whereas most research has focused on the cognitive aspect, the emotions that accompany this belief system deserve equal attention and may be helpful for designing interventions targeting the fixed mindset belief.

### 2.1. The aversive nature of effort

To illustrate, let us begin with the centerpiece of the intelligence mindset model – beliefs about effort. As just discussed, the two mindsets differentially attribute effort to evidence that an ability is lacking (fixed mindset) or as a key ingredient in the recipe for success (growth mindset; Dweck, 1999). Mindset interventions (discussed below) also place a great emphasis on effort in order to promote growth mindset thinking. But what is effort? Effort is the intensification of either mental or physical activity in the service of achieving some goal (Inzlicht, Shenhar, & Olivola, 2018).

Notably, the investment of effort conflicts with a fundamental law of psychology and behavioral science, the law of least resistance, in which organisms prefer to conserve energy whenever possible (Zipf, 1949). Although classically applied to physical effort (Hull, 1943), subsequent work has identified the same principle applies to mental effort, with people preferring less cognitively demanding choices when they can (Kool, McGuire, Rosen, & Botvinick, 2010). Indeed, mental effort is unequivocally costly in terms of energy expenditure, with a suite of neurobiological processes that bring it about (Sarter, Gehring, & Kozak, 2006; Shenhar et al., 2017). As such, it is perhaps not surprising that decades of research document an increase in negative affect that accompanies effort, including anxiety, frustration, confusion, and irritation (e.g., Garbarino & Edell, 1997; Inzlicht et al., 2018; Saunders, Milyavskaya, & Inzlicht, 2015; Spunt, Lieberman, Cohen, & Eisenberger,

2012). Tasks that require effort often involve a degree of uncertainty and ambiguity, two experiences that reliably elicit anxiety (Amin, Foa, & Coles, 1998; Dugas et al., 1997). The increase in negative affect is observed at precise moments of effort investment measured with psychophysiological assessments including pupil dilation (van der Wel & Steenbergen, 2018), corrugator supercilii contraction (van Boxtel & Jessurun, 1993), and activity in anterior cingulate cortex (ACC; Shenhav, Botvinick, & Cohen, 2013; cf. Inzlicht et al., 2018), all of which are also linked to feelings of discomfort. In short, *effort itself is aversive and associated with negative affect*<sup>1</sup>. Note that I am mostly referring to the moment-to-moment experience with effort investment, but I suspect the accumulation of these affective experiences, along with meaning-making frameworks (mindsets) interact to create global appraisals of effort.

## 2.2. Individual differences in mindsets and emotional responses to effort and challenge

Because effort is inherently tied to feelings of discomfort, beliefs about effort are inherently tied to beliefs about emotions. The fixed mindset is not just about avoiding effort; it is also about avoiding the uncomfortable emotions that come with not knowing how to do something easily. In contrast, the growth mindset views experiencing these emotions as natural to success, because these emotions often accompany the experience of effort. Thus, the two intelligence mindsets differentially relate to beliefs about uncomfortable emotions. Here I suggest that fixed mindsets amplify this aversive emotional response to effort<sup>2</sup>. Indeed, decades of work have documented associations between fixed mindsets and negative affect, particularly following setbacks and during challenges (previously reviewed by Burnette et al., 2013, 2020; Schleider et al., 2015). For instance, Diener and Dweck (1978) studied “helpless responders” – children who reliably were unable to recover from setbacks during a difficult task, akin to those with more of a fixed mindset. Summarized later by Dweck and Leggett (1988), “...helpless children began to express pronounced negative affect...[including] aversion to the task, boredom with the problems, or anxiety over their performance” (p. 257). Thus, emotional reactions (anxiety, aversion) and defenses (boredom) were recognized very early in this research area. Notably, these emotional differences appeared only once children began experiencing failures.

Nearly 40 years later, Dweck is still describing the emotional experiences as critical to the fixed mindset. Writing to educators, Dweck (2015) instructs:

“Watch for a fixed-mindset reaction when you face challenges. Do you feel overly anxious, or does a voice in your head warn you away? Watch for it when you face a setback in your teaching, or when students aren’t listening or learning. Do you feel incompetent or defeated? Do you look for an excuse? Watch to see whether criticism

<sup>1</sup> Inzlicht et al. (2018) argue that effort is also associated with many positive feelings. For instance, people tend to value outcomes more if they resulted from intensive efforts. Indeed, effort is considered a highly valued pursuit, and at times people can thoroughly enjoy the experience of effort. However, most of the positive aspects of effort described by Inzlicht et al are derived from the products of effort, not effort itself. My discussion focuses on the actual moment-to-moment experience of effort itself, which is more likely to be experienced as aversive.

<sup>2</sup> Of course, individuals differ in how much effort they need to put in to achieve a particular goal. For a given task, students with lower abilities will need to invest in more effort than students with higher abilities. Importantly, however, intelligence mindset beliefs are not strongly correlated with estimates of actual intelligence or cognitive ability (Burgoyne et al., 2020; Dweck, 1999; Macnamara & Rupani, 2017; Spinath, Spinath, Riemann, & Angleitner, 2003; Storck & Furnham, 2013). Thus, cognitive ability cannot fully explain differential experiences of effort between the mindsets.

brings out your fixed mindset. Do you become defensive, angry, or crushed instead of interested in learning from the feedback? Watch what happens when you see an educator who’s better than you at something you value. Do you feel envious and threatened, or do you feel eager to learn? Accept those thoughts and feelings and work with and through them. And keep working with and through them.” (p. 3)<sup>3</sup>

Apparent from this quote is that Dweck, the leading mindset scholar, places great importance on monitoring for emotional reactions that may signal a fixed mindset and *sitting with these feelings (not avoiding)* to encourage a *growth response*. We see a striking contrast between the fixed response (anxiety and avoidance) and the growth response (emotional acceptance). Indeed, empirically, we have found that fixed mindsets of intelligence are associated with use of an emotion regulation strategy called expressive suppression (Gross & John, 2003), which entails hiding emotional expression when distressed, and is usually considered an avoidance strategy (Schroder et al., 2015 Studies 1 and 2 but see Tamir, John, Srivastava, & Gross, 2007). Moreover, individuals with fixed mindsets of intelligence prefer defensive strategies to maintain their self-esteem (Nussbaum & Dweck, 2008). Given that there is more “at stake” with failures in the fixed mindset perspective, this will naturally lead to greater anxiety and therefore greater efforts to reduce the anxiety. This is to say that individuals with a fixed mindset may be avoiding contact with the distress that effortful behavior entails. Avoidance of affect is a key mechanism in the development and maintenance of many forms of psychological disorder (Foa & Kozak, 1986).

In addition to greater anxiety, the fixed mindset is also associated with more shame (Tracy & Robins, 2006), particularly following failures. This follows the attributional account of mindsets; in the fixed mindset, individuals are attributing success and failures to an internal, uncontrollable, and stable aspect of themselves (i.e., intelligence). Indeed, an important antecedent of shame is an attribution for failure that is self-focused and uncontrollable (Weiner, 1985). This contrasts with the experience of guilt, which is typically associated with a sense of personal responsibility and is more likely to result from the (more growth-minded) attribution of failure to a controllable lack of effort.

## 2.3. Emotional messages in mindset inductions and interventions

### 2.3.1. Laboratory-based mindset inductions

We have seen that intelligence mindsets reliably relate to differences in negative affect, particularly when challenges arise. Let us turn now to the messages used to induce fixed and growth mindsets. One of the most common experimental growth mindset manipulations asks participants to read a *Psychology Today*-like news article describing intelligence as resulting from a “challenging environment” (e.g., Bergen, 1991; Hong et al., 1999). These articles do not explicitly describe intelligence as malleable, but simply focus on the supposed origins of intelligence. What does a “challenging environment” imply? Again, this phrase implies one can expect to face uncomfortable emotions (otherwise it would not be challenging) and tolerating these long enough to “build the brain’s muscle” (perhaps the most commonly used metaphor for the growth mindset). In cognitive-behavioral terms, this process is termed an *exposure*, or intentionally confronting anxiety long enough to notice a decrease in intense affect. Thus, the articles used to induce the growth mindset implicitly send two messages: one, that intelligence can be developed, and two, the type of work this requires may include anxiety and frustration (i.e., it is “challenging”). In contrast, fixed mindset induction articles discuss the genetic etiology of intelligence. In these inductions, experience – which I argue implies the experience of emotions – is left out of the equation; emotions are not discussed and are thus implicitly avoided. The message is that uncomfortable emotions are not

<sup>3</sup> I thank an anonymous reviewer for suggesting this quote.

relevant for success; some hidden essence (intelligence) is responsible.

### 2.3.2. Scalable mindset interventions

In addition to these lab-based mindset manipulations, more extensive interventions have been employed to instill growth mindsets at larger scale. Here, too, we see communication about how best to handle emotions. One recent example is provided from [Yeager et al. \(2019\)](#), who used a self-administered mindset intervention consisting of two sessions to ninth grade students ( $N = 6,320$  students from 65 different schools). The content of the intervention described the brain's malleability, the value of effort, and specific strategies that students can use to overcome challenge, which are all common elements of these interventions (e.g., [Blackwell, Trzesniewski, & Dweck, 2007](#)). As part of the "saying is believing" method, students in the growth mindset condition were given the following prompt, which was one of three writing prompts the authors considered to be key to the intervention:

"Think about new students coming to 9<sup>th</sup> grade next year. Imagine a student who is struggling in one of their classes and is feeling discouraged. Maybe the work feels too hard for them, or maybe they are having trouble staying motivated. What is the most important thing (or things) you have learned today that could help them? Write a personal letter to encourage a 9<sup>th</sup> grader next year in the box below" ([Yeager et al., 2019](#), pg 19 of Supplemental Materials).

This prompt is designed to encourage students to think of ways to deal with difficult emotions (words like *struggling, discouraged, trouble staying motivated*). In the growth mindset framework, these experiences are normative, expected, and acceptable in the context of learning.

In an online video intervention called Project Growing Minds (see [Burnette, Hoyt, Dweck, & Auster-Gussman, 2017](#)) – a freely available mindset intervention ([www.projectgrowingminds.com](http://www.projectgrowingminds.com)) – there are also messages about emotional tolerance. The first step in the Introduction portion of the intervention consists of a video explaining fixed and growth mindsets. Embedded in this introduction is a message about emotions, "these [fixed-minded] students *worry* about proving their ability, *avoid* challenges that make them *feel bad*, and become *discouraged* by setbacks" (italics added). Later, the video states, "When a grade is lower than desired, students with a growth mindset may be disappointed, but then they think "What can I learn from this?" Note the differential treatment of not only the failure experience and related cognitions, but also of how to handle the resulting emotional responses. The emphasis on the growth mindset approach contrasts with the "worried, avoidant and discouraged" fixed mindset. Another video in this intervention features Dr. Jeni Burnette, a prominent mindset researcher, explaining that fixed-minded students view challenges as threatening, implicitly suggesting that the growth-minded approach would not view failure as threatening. Thus, even in these mindset interventions, which heavily emphasize differential cognitions and attributions about failure, we see messages about emotions.

### 2.3.3. Parental beliefs

Studies of how mindsets are communicated to children also offer insights into the role of emotional tolerance. Intuitively, growth-minded parents should have more growth-minded children. However, this is not the case, and several studies show no relationship between parents' and children's intelligence mindsets ([Gunderson et al., 2013](#); [Haimovitz & Dweck, 2016](#); see [Haimovitz & Dweck, 2017](#)). Recently, [Haimovitz and Dweck \(2016, 2017\)](#) have proposed that an alternative set of parental beliefs – called failure mindsets – are more closely related to children's mindsets of intelligence. Parents who view failure as debilitating or as an impedance to learning are more likely to have children who have fixed mindsets, whereas parents who view failure as crucial for learning are more likely to instill the growth mindset. Interestingly, the method [Haimovitz and Dweck \(2016\)](#) used to induce a failure-is-debilitating mindset consisted of completing a questionnaire with emotionally

laden items (e.g., "Experiencing failure can lead to negative feelings like shame or sadness, that interfere with learning"). That is, the manipulation directly implied that uncomfortable emotions impede with learning. When presented with a hypothetical scenario in which their child received a failing grade on a quiz, parents who were induced with this debilitating mindset reported more "performance-oriented" reactions compared to parents who received the failure-is-enhancing manipulation. Performance-oriented reactions consisted of comforting feedback ("It's ok that you got an F"), contingent self-worth ("I'd feel bad about myself"), pity ("I would feel nervous for my child"), and social comparison (wanting to know how other students performed). All of these categories focus on emotional reactivity or regulation for either the parent or the child. Thus, parental beliefs that are thought to partially give rise to mindsets in children have to do with the *emotional consequences of failure*.

These parental beliefs about the consequences of failure can lead to differential responses to the emotional distress in children following failure. Parents can respond with immediate comfort in attempts to assuage the distress, or they can be curious with the child about what they can do next *without* sending the message that these emotions are something to be avoided. Of course, no parent wants to see their child feel anxious, distressed or frustrated. It is a natural impulse for all people to comfort others in times of emotional struggle. However, there is a balance between communicating validation and comfort and sending the message that discomfort should be avoided at all costs. In her popular psychology book summarizing this work, *Mindset*, [Dweck \(2006\)](#) describes the story of Elizabeth, a gymnast who does not win during a competition, and is "devasted" when she comes home (p. 180-182). There are several potential messages her father can give her, according to Dweck. He could say, 1) "I thought you were the best", 2) "You were robbed of a ribbon that was rightfully yours", 3) "Gymnastics isn't that important", 4) "You have the ability and will surely win next time", or 5) "You didn't deserve to win". Dweck contends this last option is actually the most growth-minded message (although not necessarily put this bluntly). She further states that the father said this to Elizabeth: "I know how you feel. It's so disappointing to have your hopes up and to perform your best but not to win. But you know, you haven't really earned it yet. There were many girls there who've been in gymnastics longer than you and who've worked a lot harder than you. If this is something you really want, then it's something you'll really have to work for." [p. 181]. Note that this more growth-minded parental response explicitly acknowledges the feelings of disappointment and normalizes it. The four other messages discourage Elizabeth from feeling her feelings.

### 2.3.4. Teaching practices

Teaching practices may also induce mindsets among students. Here too we see implicit messages about emotional avoidance and acceptance. In a series of studies, [Rattan, Good, and Dweck \(2012\)](#) assessed relations between mindsets of math ability and reactions to students when they fail math assessments. Results showed that instructors with more of a fixed mindset of math ability were more likely to provide comforting feedback to struggling students. Examples of comforting feedback include consoling statements ("It's ok, not everyone is a math person"). The researchers contrasted this approach to a more active, engaging approach, supposedly indicative of a more growth-minded approach (e.g., "I'm going to call on you more in class to challenge you more frequently"). Again, the implicit message is focused on emotional tolerance. The impulse in the fixed-minded approach is to *comfort* (alleviate feelings of grief or distress), sending the message that the uncomfortable feelings accompanying failure in the context of learning are to be avoided. In fact, this fixed-minded response is exclusively focused on alleviating distress. In contrast, the growth-minded approach is to view discomfort as a normative, temporary, and expected response in this context, not something to be avoided. Thus, we see with the discourse of teaching that mindsets relate to

differential responses to students' uncomfortable emotions.

### 2.3.5. Types of praise

A final way of inducing mindsets is through praise for performance. Research has distinguished between *person praise*, which attributes successful performance to the person (or an invisible entity within a person, like intelligence), and *process praise*, which attributes performance to a visible behavior performed by the individual (i.e., trying hard). Mindset researchers typically prefer process praise interventions to induce a growth mindset. In a classic study, Mueller and Dweck (1998) praised children after a successful trial by either exclaiming, "You must have worked hard at these problems" (process praise, growth message) or "You must be smart at these problems" (person praise, fixed message). While the explicit communication deals with attributions of effort and success, the implicit message is focused on emotions. Again, "working hard" (effort) comes with negative affect (anxiety, frustration, disappointment). Thus, the implicit growth mindset message is, "Nice job, you must have endured anxiety and frustration to succeed" and the implicit fixed mindset message is, "Nice job, you didn't have to experience any discomfort to succeed". If children understand that effort entails dealing with anxiety, frustration, and (for those with fixed mindsets) shame, this second implicit message focused on avoidance of emotions is being communicated.

I should note that the key set of findings from the Mueller and Dweck (1998) study – that praise for effort resulted in improved task performance after failure – has not been replicated in subsequent work (Li & Bates, 2019), and the story for how praise impacts performance is surely more complicated than once thought. However, the study of differential praise messages is relevant for the current discussion for two reasons. First, the emphasis on attention to effort and process over intelligence and talent is an underlying assumption of how mindsets develop (Gunderson et al., 2013; Pomerantz & Kempner, 2013), and is a key message in many mindset interventions (e.g., Project Growing Minds). Second, here we are not as interested in enhanced performance on post-failure trials, but on the *communications about emotion*. That is, why people feel compelled to give others a particular form of praise, and what implicit messages about emotions are carried in these types of praise. For instance, parents are more inclined to provide person praise to children with low self-esteem compared to children with higher self-esteem, and these children experience more shame and self-blame when receiving person praise (Brummelman et al., 2014; Kamins & Dweck, 1999). I contend that this reflects acting on an impulse to (temporarily) alleviate the child of distress (by boosting their self-esteem), inadvertently promoting emotional avoidance. Person praise, which is a staple in most discussions of mindset, is also relevant for communications about emotional avoidance.

### 2.4. Personality mindsets and emotional responding

I have focused exclusively on mindsets in the intelligence domain to allow for a more focused discussion of how emotions play a role in mindset mechanisms. However, an accumulating body of work also suggests mindsets of *personality* (beliefs about the malleability of personality) are relevant to clinical outcomes (Schleider & Schroder, 2018; Yeager et al., 2014), which I will briefly summarize here. Indeed, early work indicated school children with fixed mindsets of personality responded to social challenges with helpless responses (Erdley, Cain, Loomis, Dumas-Hines, & Dweck, 1997). More recent interventions designed to induce a growth mindset of personality demonstrate decreases in depression (Miu & Yeager, 2015), stress (Yeager, Lee, & Jamieson, 2016), aggression (Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011), and increases in perceived control, a protective factor against anxiety and depression (Schleider et al., 2015).

In the personality mindset domain, *social* failures and stressors are thought to bring about mindset-related differences, analogous to academic failures in the intelligence mindset domain. Thus, individuals

with fixed mindsets of personality attribute awkward social interactions or social challenges to a fundamentally flawed aspect of their personality. Similar to the intelligence mindset, the personality mindset also involves differential responding to emotions. Indeed, Yeager et al. (2011) contend "even a minor incident – like being ignored or teased – can be loaded with emotional significance" (pg. 1092). It is not surprising that these individuals also experience more shame ("bad feelings about the self", Yeager et al., 2011) and negative affect more broadly (Burnette et al., 2020; Schleider et al., 2015).

Interestingly, a closer read of this literature also suggests that messages about emotion are imbedded in the personality mindset interventions, similar to the intelligence mindset studies reviewed above. For instance, Schleider et al. (2015) examined a 30-minute single-session personality mindset intervention for adolescents. Notably, four of the five major components of the intervention explicitly dealt with emotions (i.e., evidence that behaviors are controlled by thoughts and feelings; testimonials from older students describing that shyness, sadness, and anxiety [which help make up personality] are malleable; descriptions of how older youth would respond following social stress and feared embarrassment; prompts asking adolescents how they would feel following peer rejection). Thus, personality mindset interventions also invoke strategies about how best to handle emotions.

### 2.5. Summary of mindsets and emotional responses

To summarize, many mindset manipulations provide two key implicit messages. The first message is that hard work can help develop ability; this message has been expanded upon in much of the extant literature (Dweck & Yeager, 2019). The second, *perhaps even more implicit* message is that tolerance of uncomfortable emotions is important for this development, and avoidance of this discomfort can impede learning. So, mindsets are simultaneously related to the cognitive attributions of effort and a willingness to sit with uncomfortable emotions. A concrete example can illustrate the point. A child and parent are putting together a new Lego figurine. At first it is clear which pieces go together, but at a point it is not obvious, and the child gets stuck. He begins to cry and is upset that he cannot figure it out quickly. The fixed-minded response is to demand the parent to intervene: "just do it for me!". This response serves a couple of functions: one, the task will be completed more quickly, and two, the discomfort associated with not knowing how to put the toy together is released from the child's experience. The growth-minded response may also involve crying and feelings of upset, but not necessarily demanding the parent to intervene. Although frustration may still occur, the child may stick with it long enough to turn the pieces over, examine the other parts, and come up with a solution. This willingness to tolerate uncomfortable emotions can afford growth-minded individuals additional time to generate new strategies. I will now turn to a budding cognitive neuroscience literature to demonstrate that responses between growth and fixed mindsets begin to differ precisely at these moments of not knowing.

### 3. The cognitive neuroscience of intelligence mindsets: Internal attention allocation to mistakes

Cognitive neuroscience methods provide additional insights into how mindsets differ in terms of information processing. To date, four studies have examined mindsets using event-related brain potentials (ERPs), signals that are elicited after internal or external events with precise temporal resolution (Luck, 2014). In the first study (Mangels, Butterfield, Lamb, Good, & Dweck, 2006), fixed- and growth-minded college students were given a difficult general knowledge task. Students were prompted with a question, gave their response, and then received two types of feedback: the initial correct/incorrect feedback, and then the correct answer. The results showed that growth-minded students displayed a deeper processing to the corrective feedback and that this enhanced attention allocation predicted better performance on

a surprise retest later in the testing session (Mangels et al., 2006).

Subsequent studies have extended these findings. Whereas the Mangels study focused on ERPs time-locked to the presentation of feedback, more recent studies have evaluated the ERP response *immediately after committing mistakes* -that is, before the presentation of any external feedback. When mistakes are made in speeded-response tasks, two ERPs are elicited within 500 milliseconds (ms): the error-related negativity (ERN), which arises 50-100ms after an error, and the error positivity (Pe), which follows the ERN around 200-500ms after the error (see Falkenstein, Hoormann, Christ, & Hohnsbein, 2000; Gehring, Goss, Coles, Meyer, & Donchin, 1993). Whereas the ERN reflects an automatic, unconscious detection of response conflict (Yeung, Botvinick, & Cohen, 2004) and is generally considered the brain's first signal that something has gone wrong (Bartholow et al., 2005), the Pe reflects a more conscious error awareness signal that is more indicative of attention allocation to the error (Endrass, Franke, & Kathmann, 2005; Nieuwenhuis, Ridderinkhof, Blom, Band, & Kok, 2001; Overbeek, Nieuwenhuis, & Ridderinkhof, 2005; Ridderinkhof, Ramautar, & Wijnen, 2009; Steinhauser & Yeung, 2010).

In two studies, growth mindsets were unrelated to the ERN, but were positively associated with greater amplitude of the Pe in both college students (Moser, Schroder, Heeter, Moran, & Lee, 2011) and school-aged children ages six to eight (Schroder et al., 2017), suggesting that the growth mindset is uniquely related to the conscious, attention allocation toward mistakes. Both studies also found that growth-minded individuals were better able to "bounce back" from their mistakes, showing higher accuracy after errors than their fixed-mindset counterparts. These data suggest that the mindsets are differentially related to the conscious experience of having just made a mistake.

The final study (Schroder, Moran, Donnellan, & Moser, 2014) experimentally induced growth and fixed mindsets using the *Psychology Today*-like articles as described above before college students performed a speeded-response task. Again, the manipulation had no effect on the ERN, or the initial unconscious error signal. Unexpectedly, the Pe was increased in the fixed mindset condition relative to the growth condition. However, we also found that the growth mindset condition was associated with an increase in another ERP component – the P300, which is elicited after the stimulus (before the response has been made). The P300 is linked with attention allocation toward motivationally relevant stimuli (Polich, 2007). The pattern of findings suggests that individuals in the growth condition paid more attention to difficult stimuli, recruiting attentional resources ahead of time before the response. Lastly, there was a strong correlation between attention paid to mistakes (Pe) and more efficient post-error responding (post-error reaction time) in the growth but not fixed condition.

Each of these four studies found that mindsets did not relate to the initial "good vs. bad" evaluation of stimulus or response information. This would have been apparent in earlier ERPs, such as the ERN. Rather, all four studies indicate that mindsets are specifically associated with later, more conscious, attentional resource allocation directed toward mistakes (e.g., the Pe). These studies suggest that in terms of information processing, the two mindsets begin to diverge when individuals first become conscious that a mistake has been made. Although the functional significance of the Pe is not yet entirely understood (Overbeek et al., 2005), some have argued that it reflects the affective response to an error (Falkenstein et al., 2000). If this were the case, then these studies would indicate that mindsets are linked to the emotional experience of having made a mistake, or perhaps directing attention toward this affective experience. Regardless of the affective functional significance of the Pe, past research is clear that it is related to attention allocation and the accumulation of evidence of having made a mistake (Ridderinkhof et al., 2009; Steinhauser & Yeung, 2010). Thus, the mindsets differ with respect to how much attention is paid to the task once a mistake has been made.

#### 4. Clinical example of the intelligence mindset framework

We have seen from the cognitive neuroscience literature that mindsets are associated with differential reactions to mistakes and negative feedback immediately after they occur. Or, more accurately, mindsets relate to different responses as soon as an individual *consciously realizes he or she does not know something* (i.e., when a mistake has been made). Growth-minded individuals tend to direct more attentional resources toward this moment whereas fixed-minded individuals tend to withdraw their attention from this experience. It stands to reason that from the fixed mindset perspective, this experience is too painful to direct attention toward it, and it is likely that defenses are employed at this very moment. In fact, from the fixed mindset perspective, the experience of not knowing can be devastating. These individuals may have learned from an early age that failures are debilitating and are to be avoided at all costs (Haimovitz & Dweck, 2016). Indeed, over four decades of research indicate that children with fixed mindsets and/or performance goals express frustration and anger when confronted with challenges (Dweck, 1975; Dweck & Leggett, 1988). It is likely that frustration, particularly when it is directed outwardly toward another person (i.e., the person who provided the challenge in the first place) is more tolerable than the anxiety of not knowing. In short, the frustration accompanying effort may be a defense against the anxiety that comes with the moment of not knowing. The goal in therapy, then, may be to encourage clients to confront this initial anxiety without relying on defenses to avoid this discomfort.

This implies that there are two ways to target fixed mindsets in therapy: 1) to challenge the meaning-making frameworks around ability, effort, and failure, and 2) to expose individuals to the uncomfortable emotions that arise in these contexts. A similar distinction is made in the post-traumatic stress disorder (PTSD) literature. Although both cognitive processing therapy (Resick, Monson, & Chard, 2017) and prolonged exposure (Foa, Hembree, & Rothbaum, 2007) target core PTSD symptoms, the former focuses on meaning-making and dysfunctional beliefs through cognitive restructuring, whereas the latter focuses on behavioral and emotional avoidance by engaging in exposures. Studies indicate these approaches, which focus on different mechanisms, are equally effective in reducing both symptoms and maladaptive beliefs (Resick, Nishith, Weaver, Astin, & Feuer, 2002; Watkins, Sprang, & Rothbaum, 2018). Similarly, there may be multiple ways of targeting fixed mindset beliefs.

In exposure therapy, we routinely assess for specific situations that are particularly anxiety-provoking and then encourage our clients to confront these situations. To target the fixed mindset, then, the work is to direct attention toward a precise *moment of not knowing something* and to inquire about the thoughts and feelings that arise. The goal is to slow down these moments so that the automatic reactions can be fully accessed and sorted out. Cognitive restructuring can be used as well, and habituation to the intense affect can occur. I will now illustrate how this framework can be used with a brief case example.

Ben<sup>4</sup>, a 20-year-old college student, presented for therapy with severe obsessive and compulsive symptoms, repeated self-harm rituals, and a recent suicide attempt. He had dropped out of college twice because of feelings of academic discouragement and difficulty with motivation, despite being very bright. For the first five months of therapy, we were engaged in focused exposure therapy targeting his OCD behaviors. His core fear was contracting an illness, and various exposures targeted this core fear. He did very well with these exercises and his obsessive-compulsive symptoms decreased dramatically. We explicitly discussed the nature of habituation and he was able to pay close attention to the level of his anxiety in his body and notice the subsequent decrease accompanying the exposures.

<sup>4</sup> This is a pseudonym to protect confidentiality. The client read and consented to this description of his therapy experience.

We then proceeded to target his school-related behaviors and cognitions. Ben had a long-standing tendency to avoid putting effort into his schoolwork. I surmised he was viewing his schoolwork from a fixed mindset perspective – indeed, we discussed explicitly his belief that putting in effort made him less smart than his peers. When something did not “click” right away or he could not finish something easily, he tended to experience anger and frustration with the assignment (“This is stupid”) and distract himself by watching videos or mentally checking out. Upon further examination, we understood these “moments of not knowing” to be very anxiety-provoking. It was in these moments that he thought he was not smart after all. This came up frequently in his schoolwork and in social encounters as well, as his friends could discuss topics at length, and if he did not understand the topics he would disengage from the conversation. We first focused on his automatic attributions about effort: “How do you know you’re not smart if you don’t get something right away?”, “Are other people not smart if they work hard”? In subsequent months, we treated these moments as the targets for exposure. Specifically, we framed *doing homework* as an additional exposure exercise – the exposure was to his anxiety and discomfort arising from not knowing something right away. The theory was that if he could tolerate this initial discomfort at the discovery that a task was difficult and required effort, sticking with his homework assignments through to completion could be achieved. We worked on this type of exposure while he took a summer class. Initially he avoided the homework assignments until the very last minute, sometimes spending up to 10 hours at a time catching up. The outcome of this was overwhelming and discouraging. By the end of the course, however, he learned that confronting his initial anxiety at the outset, when he was first assigned a new piece of homework, was tolerable, did not take as long as he had intended, and could be managed. By the end of the summer course he was nearly caught up on his homework assignments. He also learned that breaking his assignments into smaller more manageable parts made this work easier, and the anxiety that comes with not knowing something right away was more manageable.

In my view, this was a pivotal learning moment in our work together: learning that tolerating and withstanding the *anxiety from not knowing something right away* was not only possible, but necessary to achieve a successful course grade. During his first semester back to college, approximately nine months after our therapy began, Ben adopted several new study strategies he had not tried previously. He finished his homework assignments on time, he studied persistently, and generally thought and spoke about his schoolwork often. His parents commented that he seemed like a much more motivated student. He finished the semester with a high grade point average and his OCD symptoms were well-controlled. He had a new viewpoint about effort that he brought into his second semester. He received even higher grades during his second semester, continuing the work ethic he had started earlier. His underlying beliefs about effort and his response to the accompanying affective experience have shifted dramatically. I believe this combination of gentle questioning about his beliefs about effort, and the repeated exposure to his anxiety and frustration with not “getting it quickly” were paramount to this turnaround.

This brief example illustrates the utility of looking for these “moments of not knowing” and the associated affects, beliefs, and avoidance tendencies. Again, the literature reviewed above suggests it is at the precise moment when one realizes he or she does not know something when fixed and growth-minded individuals begin to differ in their responses. There appears to be a decision point when something is not realized; one can either engage with this, inquire further, and struggle, which may increase the possibility of learning (growth response) or avoid, deflect, and disengage, precluding the possibility of learning (fixed response). These moments likely happen many times per day, and not all moments will be treated the same. Directing attention toward them nonjudgmentally may promote adaptive behaviors following mistakes and these moments of not knowing. Carol Dweck has recently emphasized the language of “using” mindsets rather than “having

mindsets”. In this discourse, then, individuals differ in terms of how often they use fixed or growth responses to difficult and emotionally evocative situations.

To summarize, mindsets of intelligence are relevant to clinical psychology because they provide meaning frameworks for not just effort and sticking with challenges, but also how to best handle emotional responses arising from effort, challenges, and setbacks. I have referred to especially salient experiences as “moments of not knowing”, which is when mindsets begin to differentiate in terms of emotional responding. Because the fixed mindset provides a meaning-making framework that conceptualizes investment of effort, failure, and challenge as inherently threatening, more intense emotions arise during these situations. Thus, interventions designed to instill a growth mindset can simultaneously target the underlying belief systems as well as provide resources to tolerate and adaptively regulate uncomfortable emotions.

## 5. Emotion mindsets: Empirical applications to clinical science

In addition to the clinical implications of the more generic mindset of intelligence raised above, some researchers have examined beliefs more explicitly related to mental health. The idea has been to leverage what we know about mindset theory and apply this more directly to mental health variables. Mindsets of emotion (Tamir et al., 2007), shyness (Valentiner, Mounts, Durik, & Gier-Lonsway, 2011), and anxiety (Schroder et al., 2015) have been examined with an eye toward clinical applications (for reviews, see Burnette et al., 2020; Howell, 2017; Kneeland, Nolen-Hoeksema, Dovidio, & Gruber, 2016). These mindsets are measured the same way as the intelligence mindset, with self-report items inquiring about the perceived malleability of emotion or anxiety. Mindsets of anxiety and emotion are psychometrically separable from mindsets of intelligence and personality, with exploratory (Schroder et al., 2015) and confirmatory (Schroder et al., 2016) factor analyses demonstrating these mindsets lie on separate factors. That is to say, the anxiety and emotion mindsets are not redundant with the more traditional mindsets of intelligence and personality.

In general, this research has found that growth mindsets of emotion and anxiety are associated with several positive health outcomes (Burnette et al., 2020). I will focus on the anxiety mindset for the purpose of this discussion, as we typically find this mindset to be more predictive of outcomes than other mindsets, including the emotion mindset. The anxiety mindset scale was developed and evaluated in college student samples (Schroder et al., 2015, 2016). Although items on the scale (see Appendix) refer to “anxiety” – which could either refer to transient state anxiety or trait-like anxiety – we typically find strongest correlations with measures of trait anxiety (Schroder et al., 2015).

At this point, we have several findings that suggest the anxiety mindset can be useful clinically. First, growth beliefs of anxiety are negatively related to psychological distress, including anxiety, depression, perfectionism, interpersonal problems, and borderline personality traits (Schroder et al., 2015, 2016; Yalch, Schroder, Dawood, & Donnellan, 2017). In fact, we recently found that the growth mindset of anxiety prospectively predicts future decreases in distress (Schroder, Callahan, Gornik, & Moser, 2019). Second, like the growth mindset of emotion (De Castella et al., 2013; Kneeland, Dovidio, Joormann, & Clark, 2016; Tamir et al., 2007), the growth mindset of anxiety is positively correlated with the use of cognitive reappraisal (Schroder et al., 2015), an emotion regulation strategy that involves thinking of alternative interpretations of a situation in order to change one’s mood (Gross & John, 2003). In contrast, the fixed mindset of anxiety is linked with many avoidance-based emotion regulation strategies, including expressive suppression, alcohol use, substance use, and self-injury (Schroder et al., 2015; Schroder et al., 2017). Third, the growth mindset of anxiety appears to buffer the link between a history of stressful life events, psychopathology, and maladaptive coping strategies (Schroder et al., 2017). Specifically, the association between trauma and avoidance coping strategies (e.g., substance use, self-injury) was less robust

for those with more of a growth mindset of anxiety. Such a moderating role of mindsets is similar to the intelligence mindset moderating the link between negative feedback and subsequent behaviors (Hong et al., 1999). Fourth, the growth mindset of anxiety predicts preference for psychotherapy compared to a preference of medication (Schroder et al., 2015 Study 1 and Study 2), a finding that we have replicated in eight separate undergraduate samples (unpublished data). This is consistent with mindset theory: those with growth mindsets prefer more effortful, emotionally evocative strategies to develop mastery (which can be accomplished in therapy) whereas those with fixed mindsets prefer less effortful strategies (i.e., medication).

Collectively, the findings just reviewed point to the clinical utility of the anxiety mindset. This mindset can be useful in predicting who may gravitate toward more approach-based versus avoidance-based emotion regulation strategies and who may prefer the work that psychotherapy entails. However, these studies were largely limited to unselected college student samples, which may raise questions as to how applicable this mindset is to clinical populations. To fill this gap, we recently examined the anxiety mindset in a sample of patients ( $N=274$ ) presenting to an intensive behavioral-based partial hospital treatment program (Schroder et al., 2019). The partial program included patients with a wide range of psychopathology, and nearly all diagnostic presentations were represented. Approximately half of the sample had just stepped down from inpatient level of care. The program consisted of individual and group sessions that taught cognitive-behavioral, dialectic-behavioral and acceptance commitment principles. We found that a growth mindset of anxiety predicted fewer anxiety symptoms after the program ended (an average of 12 days after admission), controlling for psychiatric hospitalization history, baseline psychiatric and anxiety symptoms, and treatment expectations. Note that the incremental variance explained by the anxiety mindset was small (just 3% of variance explained in the regression equation); this small effect size is typical of many mindset studies. Nonetheless, these findings are consistent with other studies examining closely related constructs of shyness mindset (Valentiner, Jencius, Jarek, Gier-Lonsway, & McGrath, 2013), social anxiety mindset (De Castella et al., 2015), and anxiety change expectancy (Westra, Dozois, & Marcus, 2007), in which more malleable beliefs of anxiety predicted better treatment outcomes (but see Reffi, Darnell, Himmerich, & White, 2020, who showed no relationship between baseline anxiety mindset and response to psychotherapy).

### 5.1. Case studies of the anxiety mindset

Taken together, these findings suggest that the anxiety mindset can be useful in predicting positive responses to treatment. To illustrate the utility of the mindset assessment in a therapy context, I will briefly describe two outpatient therapy cases in which mindsets seemed relevant to their outcomes. At their intake appointments, I gave both clients a battery of self-report questionnaires, including the Personality Assessment Inventory (PAI), a broadband questionnaire that assesses many aspects of clinical problems including anxious, depressive, manic, psychotic, interpersonal and borderline processes (Morey, 2007). I also administered the mindset questionnaire (Schroder et al., 2015), which assesses mindsets of anxiety, intelligence, emotion, and personality (see Appendix).

Mrs. A was a 26-year-old married woman who presented to therapy with difficulty managing her social anxiety and panic symptoms. She reported waking up every day with a sense of dread. She had been to therapy before, and it was marginally helpful. Mr. J was a 29-year-old single man who came to therapy presenting with anxiety and depression that was interfering with his academic goals. In terms of the Personality Assessment Inventory profiles, Mrs. A and Mr. J presented with very similar profiles of psychopathology and interpersonal problems; their profile scores were correlated at  $r = .70$ . This is not to say that they had identical personalities with identical presenting problems – merely that they had similar presentation styles. However, their mindset scores

at intake were markedly different. Specifically, Mrs. A presented with a growth mindset of anxiety – scoring a 6, the highest score on this measure, whereas Mr. J scored a 1 – the lowest score, indicative of a fixed mindset. That is, despite both patients presenting with significant anxious and depressive distress, and having a very similar personality profile, they had differing views on the malleability of anxiety.

So how did therapy proceed? Mrs. A did very well in therapy, which consisted of a mixture of psychoeducation, cognitive-behavioral therapy and acceptance-commitment principles. Exposure exercises were used to elicit her panic-like and social anxiety-driven experiences and then to learn that these feelings habituate. She was soon engaging in “extra credit” exposure exercises and came to several significant insights regarding how others perceived her. Her anxiety symptoms decreased substantially after the first four sessions and were maintained for the remainder of our work together, which lasted 12 weeks. My experience of Mrs. A was that she came to therapy ready to do the hard work that it entailed. She was willing to sit with discomfort both within and between our sessions, a critical piece of exposure therapy effectiveness (Foa & Kozak, 1986). Mr. J, in contrast, dropped out of therapy after just three sessions. My experience was that he was not quite ready to do the work in therapy, and I did not hear back from him after he began missing sessions. A summary of outcomes for these clients is presented in Fig. 1.

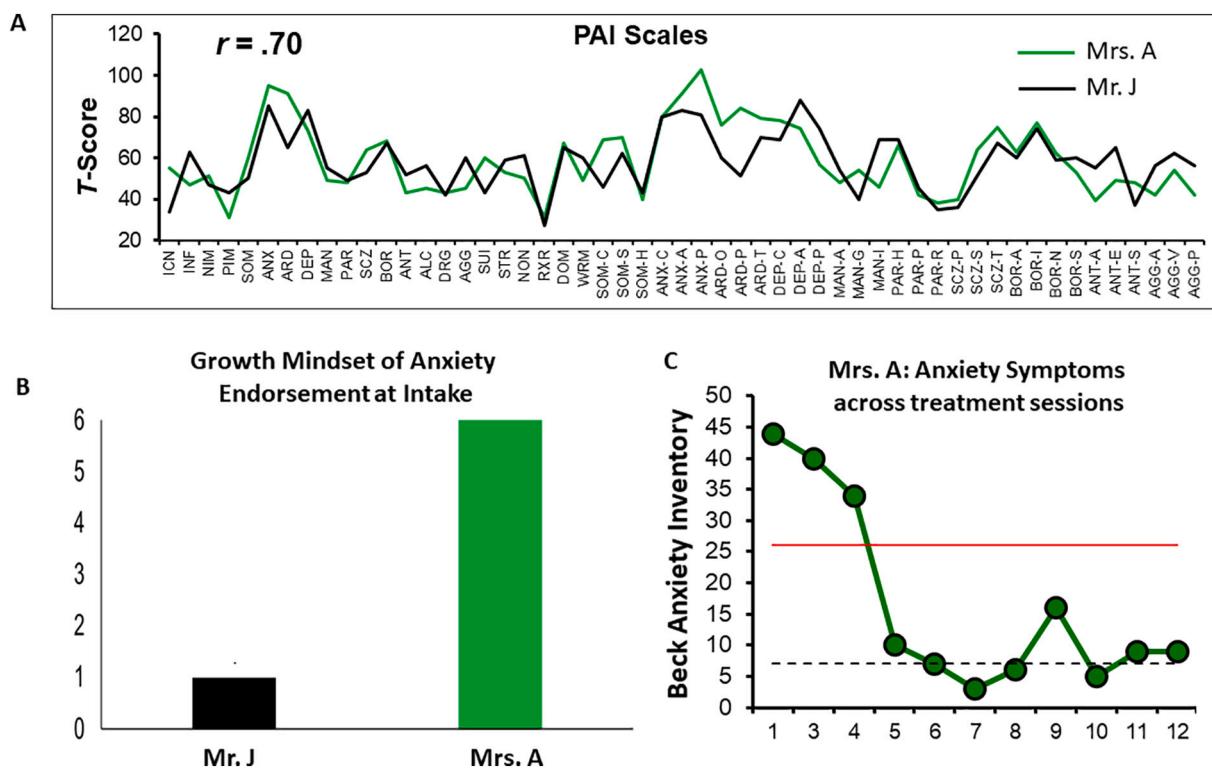
The two outcomes here are consistent with mindset theory in that the growth mindset encourages the experience of discomfort to develop mastery – in this case, developing and implementing new emotion regulation skills and learning that anxiety will habituate. Mrs. A was able to withstand her anxious distress long enough to try out new skills and come to new conclusions about her anxiety. The fixed mindset, in contrast, is associated with avoidance of difficult emotions and effortful behaviors. Mr. J's outcome fits this trajectory. The conclusion from these cases is not that mindsets completely explain the outcomes in these two patients. Rather, it is simply to illustrate the overlap with these outcomes and mindset theory more generally and to highlight the utility of assessing mindsets at the outset of therapy. The cases are primarily used for illustrative purposes, not evidence that mindsets always predict outcomes. In short, I believe mindsets can be useful assessments to determine how much patients are willing to tolerate uncomfortable emotions. It may be the case that identifying a fixed mindset profile at the beginning may point to some therapeutic targets to be aware of during the work.

### 5.2. An emerging model of the anxiety mindset

Together, the results just reviewed suggest the anxiety mindset may be a useful construct for clinical purposes. I will now propose a model linking these various findings together. The model, depicted in Fig. 2, describes how anxiety mindset beliefs relate to clinical correlates. At a given moment in a person's life, they may be more growth- or fixed-minded about anxiety. This leads to two separable paths that individuals can take. On the more fixed path, the experience of anxiety itself is threatening because it may not go away (fixed attribution). Thus, these individuals prefer avoidance strategies to help down-regulate these experiences. These can come in the form of self-injurious behaviors, substance use, and expressive suppression, correlates that have all been linked to more of a fixed mindset of anxiety. Avoidance of emotional experience is the link between these behaviors and strategies.

Moreover, the fixed mindset is consistently linked with a hypothetical preference for medication, versus individual psychotherapy. While engaging in a treatment like medication is more effortful than not engaging in treatment, taking medication is ostensibly less effortful than psychotherapy, which entails challenging longstanding beliefs and confronting upsetting feelings.

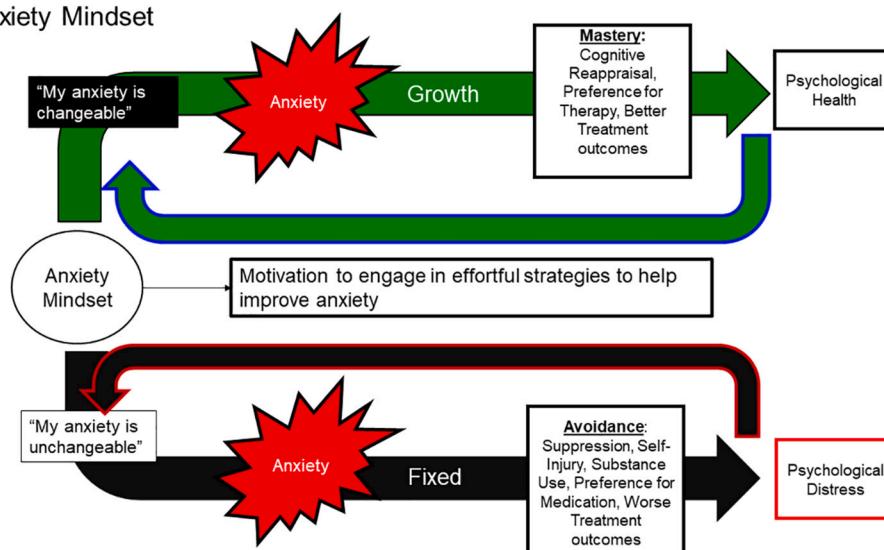
In contrast, the growth path illustrates how individuals can potentially utilize anxiety and discomfort to develop further mastery of behavioral responses to distress. These individuals do not view anxiety as threatening per se, but view it rather an experience they understand



**Fig. 1.** Case studies of the anxiety mindset

Example of anxiety mindset assessment predicting treatment outcomes from two case studies. A) Personality Assessment Inventory (PAI) profiles of the two clients described in the text. The x-axis indicates clinical subscales from the PAI. Note the similarity in profile; B) Growth mindset of anxiety assessment at the intake, with Mr. J showing a fixed mindset and Mrs. A endorsing a growth mindset. Higher scores on the y-axis indicate greater growth mindset endorsement. C) Mrs. A's anxiety symptoms were significantly reduced over the course of treatment. The solid red line shows severe symptom severity, the dashed black line shows minimal anxiety. Mr. J dropped out of treatment after three sessions.

## The Anxiety Mindset



**Fig. 2.** A working model of the anxiety mindset. In this model, individuals typically fall along one of two paths: a growth path (top) or a fixed path (bottom). The two paths differentially predict responses to anxiety and stressful life events, with the growth path predicting strategies designed to develop mastery and competence including cognitive reappraisal and individual therapy. Overall, this will lead to greater psychological health, reinforcing the idea that anxiety is malleable (depicted by the backward green arrow). In contrast, in the fixed path, individuals believe anxiety is unchangeable, and respond to anxiety and stress with emotional avoidant strategies including suppression, substance use, and self-injury, as well as a preference for a less effortful treatment (medication). On average, this will lead to greater psychological distress, reinforcing the belief that anxiety cannot change (depicted by the backward black arrow).

can be overcome and changed. Our data consistently indicate that the growth mindset of anxiety is linked to cognitive reappraisal, an emotion regulation strategy involving re-thinking distressing scenarios in order to change one's mood. The goal of this strategy is not to deny the experience of distress – as in expressive suppression – but rather to effortfully reinterpret the meaning of an experience in order to feel better. The growth mindset of anxiety is also consistently linked with a hypothetical preference for individual therapy, compared to

medication. Of these two choices, this is the more effortful option.

Finally, the case studies presented here, along with the emerging empirical treatment data (De Castella et al., 2015; Schroder, Kneeland, Silverman, Beard, & Bjorgvinsson, 2019; Valentiner et al., 2013; Westra et al., 2007) indicate that the growth mindset of anxiety predicts better treatment outcomes (but see Reffi et al., 2020). The findings from the Westra study further suggest that increased effort (measured by increased homework compliance) mediates the relationship between

beliefs and outcomes. The mediating role of effort is precisely in line with broader mindset theory (Dweck, 1999). Thus, the anxiety mindset may represent a marker for willingness to engage in effortful behaviors to improve mental health.

Collectively, this framework can be useful for clinicians and researchers to help predict who is more likely to seek out, engage, and succeed in psychological treatment. We may then expect that growth-minded individuals are more likely to be less psychological distressed than those with a fixed mindset of anxiety. The anxiety mindset assessment may thus be a useful gauge for how ready an individual is to begin the process of therapy. If a patient presents with a fixed mindset of anxiety, work may be necessary to first address this belief before moving onto the more applied work of therapy.

### 5.3. Beyond malleability: Beliefs about the utility of emotions

While I have focused on beliefs about malleability, there are many other types of beliefs about emotions that are relevant to the discussion here. Ford and Gross (2019) have recently suggested these beliefs can broadly be categorized into emotions as being controllable (similar to albeit different from mindsets) and as being good or bad. I will briefly review the latter here. Extending from meta-cognitive theory (Wells, 1999), Manser, Cooper, and Trefusis (2012) developed a scale tapping into several different beliefs about emotions, including subscales measuring the utility ("Feeling upset tells me something useful about myself") and the meaningfulness ("When I feel upset, it's a sign that something isn't right") of emotions. Beliefs of emotions as non-functional and meaningless, along with beliefs about emotions being overwhelming, shameful and irrational, are thought to contribute to severe psychological states including those associated with borderline personality traits (Manser et al., 2012). Interestingly, the meaningfulness and utility subscales showed the lowest direct correlations with attachment styles, parental discipline, threats of separation, peer support, anxiety and depression, suggesting these beliefs are orthogonal to other known risk factors for distress (Manser et al., 2012). In other words, people across the spectrum of psychological distress vary in terms of how much they think emotions provide meaningful, useful information.

There is evidence that acknowledging the utility of uncomfortable emotional states has several benefits. For instance, the literature on the "stress mindset" (which is not a mindset in the classical, malleability sense, but refers to appraisals of stress) finds that individuals who believe stress is enhancing, rather than debilitating, leads to better outcomes (Crum, Salovey, & Achor, 2013) even in intensely stressful situations such as Navy SEAL training (Smith, Young, & Crum, 2020). Moreover, reappraising bodily sensations indicative of stress (i.e., physiologic arousal) during a stressful task alters attentional focus away from negative stimuli, promotes more optimal cardiovascular reactivity (Jamieson, Nock, & Mendes, 2012), associates with less exam anxiety (Jamieson, Mendes, Blackstock, & Schmader, 2010), and with greater performance on standardized tests (Jamieson et al., 2010; Rozek, Ramirez, Fine, & Beilock, 2019). Moreover, utility-based appraisals of negative emotions more broadly correlate with less severe negative emotions after setbacks (Babij, Burnette, & Hoyt, 2019).

Indeed, an emerging "stress optimization" model integrates stress mindset and stress reappraisal research, calling for a unified area of study designed to change people's beliefs about the utility of stress (e.g., "stress is good for me"; Crum, Jamieson, & Akinola, 2020). Crum et al. (2020) suggest that reframing stress as helpful can direct attention toward the source of the stress (e.g., final exam, important work tasks) rather than the stress itself. Undue attention to physiological reactivity can lead some individuals to negatively interpret bodily sensations as having catastrophic consequences, as the literature on anxiety sensitivity suggests (Taylor et al., 2007). Instead, reminding oneself of the underlying utility of stress and other uncomfortable emotions can redirect attention to the source of where these emotions came from in

the first place. These findings indicate that reframing stress – which is often intuitively associated with distress – is a potentially important intervention.

Further evidence indicates that utility beliefs are associated with more adaptive emotion regulation strategies, including cognitive reappraisal, versus attempts to deny, ignore, or suppress emotions (Karnaze & Levine, 2018), similar to the growth mindset of emotion (De Castella et al., 2013; Tamir et al., 2007) and anxiety (Schroder et al., 2015). Karnaze and Levine (2020) have recently developed a measure called the Help and Hinder Theories about Emotion Measure, which specifically taps beliefs about the utility of emotions. Participants who were encouraged to view emotion as helpful displayed greater physiological reactivity – assessed with skin conductance response – during an upsetting film clip, but showed greater acceptance of this response.

Together, these findings imply that viewing emotions as functional signals may allow greater internal attention to physical signs of uncomfortable emotions paired with greater acceptance of these feelings, two efforts of nearly every psychotherapeutic approach to psychological distress. However, much of the work on the utility of emotions has focused on unselected, non-clinical populations. To help fill this gap, we recently found that a brief (~12 day) CBT-based partial hospitalization program significantly decreased the belief that depression was all bad (Yoon, Schroder, & Bjorgvinsson, 2020), suggesting these utility beliefs in psychiatric disorders are amenable to treatment. Nonetheless, an important endeavor for future research is to assess how individuals with more severe psychological distress understand the utility of emotions and how interventions inducing more utility beliefs operate in treatment settings.

## 6. Mindsets and narratives of mental illness

Finally, some points about how mindset theory can inform larger discussions of mental illness. It is interesting to consider the broader narratives of mental distress that have surfaced and resurfaced over the course of history (Deacon, 2013; Harrington, 2019; Jackson, 1986; Lebowitz & Appelbaum, 2019; Read, Cartwright, Gibson, Shiels, & Haslam, 2014; Whitaker, 2010). Over the last several decades, increasing attention has been given to neurobiological and genetic explanations of schizophrenia, manic depressive illness, anxiety, and depression. These explanations are touted by many individuals, governmental bodies, pharmaceutical companies, anti-stigma campaigns, scientists, and clinicians (Lacasse & Leo, 2005). In fact, one recent analysis of YouTube videos suggest that popular vloggers also endorse and disseminate biogenetic messages of depression (Devendorf, Bender, & Rottenberg, 2020). A study conducted 13 years ago (France, Lysaker, & Robinson, 2007) found most college students were exposed to the chemical imbalance message through television and other media; a recent survey of college students in 2019 indicates that most students are now exposed to the chemical imbalance theory of depression in the classroom (Schroder et al., 2020). These data, along with an analysis of popular abnormal psychology textbooks (Hunter, 2013), suggest biogenetic beliefs and messages have become a part of the mainstream culture and accepted as fact enough to be taught to students in formal education settings.

The intentions behind these messages are likely benevolent. In loving attempts to decrease blame, family members, mental health clinicians, and others may tell individuals who are struggling that it is "not your fault, it is your brain's genes' chemicals' fault". Yet, when viewed from the perspective of mindset theory, this message can induce a fixed mindset. Research by Lebowitz, Deacon, Heine, Haslam, and others has highlighted the pitfalls of holding biogenetic beliefs of mental illness. Specifically, they find that biogenetic beliefs are correlated with prognostic pessimism, or the belief that depression will last for a longer time in the future (Dar-Nimrod and Heine, 2011; Deacon, 2013; Heine, Dar-Nimrod, Cheung, & Proulx, 2017; Kemp, Lickel, & Deacon, 2014; Lebowitz & Ahn, 2017; Lebowitz, Ahn, & Nolen-Hoeksema, 2013), and

more stigmatizing attitudes (Haslam & Kvaale, 2015; Kemp et al., 2014; Kvaale, Haslam, & Gottdiener, 2013; Lebowitz et al., 2013). The tradeoff appears to be this: biogenetic messages and beliefs reduce perceptions of self-blame, but also reduce a sense of personal agency over changing the future outcomes. A sense of agency and personal responsibility to overcome are core tenets of treatment success. In these ways, holding onto biogenetic beliefs may be problematic during treatment. To that end, we have recently found in a separate sample of partial hospital patients (N=279) that individuals who espouse chemical imbalance beliefs about depression also tend to have lower treatment expectations just before beginning an intensive behavioral treatment program (Schroder et al., 2020). The link between chemical imbalance beliefs and poorer expectancies was especially pronounced for those with elevated symptoms of depression.

Together, these findings suggest that biogenetic beliefs are correlated with pessimistic perspectives of improvement. Recent calls have been made to critically re-evaluate these narratives (Deacon, 2013; Harrington, 2019; Lebowitz & Appelbaum, 2019; Miller, 2010). Another reason to shift public narratives about mental illness is that, despite increasing rates of psychotropic medication use (Olfson et al., 2002), treatments have not dramatically changed in over fifty years, and prevalence rates have only risen (Deacon, 2013; Whitaker, 2010). A few alternative messages have been proposed. One approach to combating purely neurobiological explanations of mental illness and their unintended consequences on motivation is to discuss the “biopsychosocial model” of illness, which emphasizes equally the biological, psychological, and social circumstances surrounding the onset of mental illness (e.g., Deacon & Baird, 2009). This framework is explained in many treatment protocols. Another approach, seemingly in the spirit of the growth mindset, is to emphasize the malleability of diseases, genetic predispositions, and neurobiology by invoking the research on epigenetics (e.g., Lebowitz et al., 2013; Lebowitz and Ahn, 2015).

However, both approaches may implicitly emphasize biology’s role in mental illness, which can again invoke genetic essentialist biases (Heine et al., 2017). Even biopsychosocial models of mental illness characterize a mental disorder as a hidden “essence” that people “have” or “don’t have”. This is akin to praise for children’s performance being attributable to a hidden essence of intelligence – something deep inside and implicitly characterized as immutable. This may inadvertently instill a fixed mindset about psychological distress. The most common biopsychosocial model discussed is the diathesis-stress model, which claims that vulnerability (primarily genetic in origin) interacts with stressful environments to predict psychological distress. Read (2005) has criticized the bio-psychosocial approach, suggesting that it really reflects a “bio-bio-bio” model of mental illness, with its implicit emphasis on biological reductionism. The phrase in the field of behavioral genetics, “genes load the gun, environment pulls the trigger”, also emphasizes that genetic predispositions are a necessary component to psychological distress. Moreover, the empirical support for the bio-psychosocial model based on genetic predispositions is weakening: a recent meta-analysis concluded that for depression, there is very little evidence for candidate gene or gene by environment interactions (Border et al., 2019).

Further, discussing epigenetics and the malleability of biology, although somewhat similar to growth mindset interventions, still sends the implicit message that biology and genetics are the most important aspects to consider when it comes to mental distress. The message that *genetics and biology play an important role, but they can change* emphasizes biogenetic mechanisms and minimizes the role of emotions and psychosocial circumstances. In fact, in one manipulation video discussing epigenetics designed to curtail genetic essentialist biases, emotions and psychosocial circumstances were not mentioned as playing causal roles in depression (Lebowitz & Ahn, 2017). Although likely not meant to act as a stand-alone intervention, the implicit message is that emotions are not important factors to the onset and maintenance of depressive experiences.

Notably, there is tension between biogenetic messages, which decrease self-blame but may also decrease hope for improvement, and psychosocial and malleability messages, which can promote hopeful thinking but may increase self-blame (see Hoyt & Burnette, 2020; Kneeland, Nolen-Hoeksema, et al., 2016). When people learn that their suffering is changeable, they may tend to blame themselves for getting into distress in the first place. To address this, Burnette, Hoyt, and colleagues (Burnette et al., 2017; Burnette, Forsyth, Desmaris, & Hoyt, 2019; Hoyt & Burnette, 2020) have distinguished between *onset responsibility* – the perceptions of responsibility for having a disease state in the first place – and *offset efficacy* -the belief that one has agency in their recovery. Interventions that simultaneously promote malleability beliefs and explicitly state that individuals are not responsible for the onset may be an optimal public health messaging approach.

Thus, I believe it is imperative to begin studying the effects of alternative messaging about mental health that is not centered on neurobiology and genetics. One possibility that remains to be tested is to discuss the meaning of emotions such as anxiety, sadness, and anger, normalizing these experiences as functional. Such a message would not simply emphasize the malleability of emotions but would point to their basic functions. Growth mindset interventions in the intelligence domain construe effort as functional in that it prepares individuals for success. Clinical interventions can likewise construe anxiety, sadness, and anger as functional signals that are telling the body something needs more attention. Indeed, some authors examining depression and anxiety have re-characterized these experiences as “signals” that something in a person’s life needs careful re-examination (Brogan, 2016; Hari, 2018). This message is more akin to what I envision as capitalizing on mindset theory. The narrative could be that depression is not a disorder, per se, but rather a signal that some aspect(s) in the person’s life needs addressing. This may encourage individuals not to avoid the experience of depression, but to attend to the emotional content of this experience to inform what will help them with their struggle. In fact, evolutionary theories of depression suggest it is a signal that an aspect of social circumstances is not sufficient and requires reworking (Nesse, 2000; Watson & Andrews, 2002). I suspect that reframing depression and anxiety as signals in this way would increase motivation to seek out psychotherapy in order to uncover and address these unmet needs, even more so than biopsychosocial messages. Obviously, more research is needed to test these possibilities.

## 7. Future directions

The current review indicates mindsets surely have a space in clinical science. However, this work is in its infancy. A few directions for future research are presented below.

- 1. Uncovering the origins of mindsets.** How do individuals come to believe that attributes are malleable or not? Surprisingly little is known about how more generic mindsets of intelligence and personality are developed in children. In fact, parental mindsets do not appear to be directly related to children’s mindsets (Gunderson et al., 2013). More compelling are the data indicating that consistent messaging from parents about grades, failure, achievement, and intelligence may lead to the adoption of these beliefs in children (Gunderson et al., 2013; Haimovitz & Dweck, 2016; Pomerantz & Kempner, 2013). Thus, messages about the consequences of certain actions, including the emotional consequences, may be a prime suspect of the development of mindsets among offspring. In terms of anxiety mindsets, I have suggested that narratives about mental illness may contribute to the adoption of these beliefs. However, it is very likely these beliefs are multidetermined and complexly integrated into an individual’s psychology. For instance, Haslam (2017) stressed the need to consider cognitive, developmental, social and cultural influences when assessing the origins of essentialist theories, which include mindsets of malleability. One’s own experience with

anxiety and their attempts to change it will likely also play a role in one's mindset of anxiety. For instance, initial studies suggest patients are more growth-minded after treatment (De Castella et al., 2015; Reffi et al., 2020; Schroder et al., 2019; Valentiner et al., 2013). Uncovering the development of mindsets will lead to more targeted interventions.

2. **Establishing causality and developing interventions.** The anxiety mindset model presented here is primarily based on correlational data. A critical future direction therefore is to induce growth and fixed mindsets of anxiety to test causal inferences on emotion regulation strategies, treatment seeking, motivation, and outcomes. Careful experimental manipulations of the anxiety mindset, whether in single-session format (Schleider et al., 2015) or prolonged intervention programs (Blackwell et al., 2007) are warranted. Moving forward, however, I envision that interventions targeting this belief will need to be more than didactic and will involve exercises that directly invoke anxiety reduction (i.e., exposures). Understanding how this and other mindsets change is crucial as well. Indeed, there is evidence that mindsets exhibit only moderate temporal stability (Poon & Koehler, 2008; Schroder, Callahan, et al., 2019) and can be changed as a result of motivated reasoning (Leith et al., 2014). That is, people who get unflattering test feedback may be more likely to endorse malleable views of intelligence in an effort to maintain their self-esteem (Leith et al., 2014). These data indicate mindsets change even without explicit interventions, and further work investigating what brings about these changes is needed.
3. **Discover mechanisms.** More work is needed to uncover moderators and mediators of relationships between mindsets and psychological outcomes. It is well known that mindsets' direct relationships tend to be small in magnitude (Burnette et al., 2013; Burnette et al., 2020; Sisk et al., 2018), suggesting that there are many intermediary processes involved. Uncovering these processes will be important to flesh out the model proposed here. I have suggested that non-judgmental attention allocation to error-related information, and to the accompanying emotional experience in precise moments of uncertainty and ambiguity is a critical mechanism linking mindsets of intelligence to resilience and clinical outcomes. Additional experimental studies testing this possibility with a range of methodologies (EEG/ERP, behavioral observations) is needed.
4. **Integrating mindsets from different domains.** Nearly all mindset studies have evaluated mindset domains in isolation. Factor analytic studies indicate mindsets are separable, but also that they are somewhat related to one another (Dweck et al., 1995; Hughes, 2015; Schroder et al., 2015, 2016). In fact, Schroder et al. (2016) found that a bifactor model, in which mindsets are represented by different latent factors and by a 'generic mindset factor' adequately fit the data. How do these mindsets converge to predict different clinical outcomes? That is, are there additive or interactive effects of growth mindsets of intelligence, personality, and anxiety? How do they interact to predict specific outcomes? Future work should evaluate mindsets and outcomes from multiple domains to help address these questions.
5. **Optimizing mental health narratives.** Mindset theory indicates that subtle linguistic shifts, such as praising effort versus natural talent, can impact mindsets. Thus, careful attention should be paid to how mental health problems are framed. Discussing the etiology of mental health problems is common in everyday practice – for example, early psychoeducational sessions in many behavioral treatments discuss a biopsychosocial understanding of mental illness. How do these brief mentions of etiology impact mindsets? Future research will need to optimize mental health narratives to find a balance between reducing self-blame and boosting a sense of agency and perceived changeability. A specific example to study would be the strength-based message of depression as a functional signal, as described above, in addition to understanding onset responsibility and offset efficacy (cf. Burnette et al., 2017).

## 8. Concluding remarks

To conclude, mindset theory has much to offer clinical science. Growth mindset theory has long suggested that feelings of anxiety, frustration, disappointment, and confusion that accompany effort and failure are not to be discouraged or avoided. Rather, they are to be used as signals that one is on the right track. I have suggested that for mindsets of intelligence, a critical mechanism is a nonjudgmental, useful inward directing of attention to emotional experiences immediately in the moment of not knowing. Working with these moments in therapy can bring about profound belief change.

A working knowledge of mindset theory can be helpful for clinicians who see clients that appear "stuck" in their therapy work or clients who are struggling with motivation. Clinicians who sense a fixed mindset at work may be more likely to pinpoint precise "moments of not knowing" and uncover intolerable affects and thoughts associated with these moments for further processing. I have also proposed a model linking the anxiety mindset to emotion regulation strategies, treatment preferences, and treatment outcomes. The mindset of anxiety appears to be the most immediately relevant for clinical science and can be used to gauge how ready for the work that psychosocial interventions entail. This mindset can also be used as a treatment target to instill more advantageous beliefs.

Finally, mindset theory can inform public policy. Mindset research suggests that language matters – even subtle linguistic shifts emphasizing intelligence versus effort can have important effects on beliefs about malleability. We may then consider the language used to describe emotions and the etiology of mental health problems (e.g., invoking discussions of genetics versus psychosocial circumstances) which likely have similar effects on beliefs about the malleability of mental distress. A public-wide refocusing on the utility of emotions, rather than their genetic basis, may lead to a healthier, less avoidant, and more resilient populace.

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## Declarations of Competing Interest

None

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**Appendix. Mindset Questionnaire****Theories of Anxiety Scale (TOA)**

Please indicate the extent to which you agree or disagree with each of the following statements.

Strongly Disagree      1      2      3      4      5      6      Strongly Agree

1.  You have a certain amount of anxiety and you really cannot do much to change it.
2.  Your anxiety is something about you that you cannot change very much.
3.  To be honest, you cannot really change how anxious you are.
4.  No matter how hard you try, you can't really change the level of anxiety that you have.

**Theories of Intelligence Scale (TOI)**

Please indicate the extent to which you agree or disagree with each of the following statements.

Strongly Disagree      1      2      3      4      5      6      Strongly Agree

1.  You have a certain amount of intelligence and you really cannot do much to change it.
2.  Your intelligence is something about you that you cannot change very much.
3.  To be honest, you cannot really change how intelligent you are.
4.  You can learn new things, but you cannot really change your basic intelligence.

**Theories of Emotion Scale (TOE)**

Please indicate the extent to which you agree or disagree with each of the following statements.

Strongly Disagree      1      2      3      4      5      6      Strongly Agree

1.  Everyone can learn to control their emotions.
2.  If they want to, people can change the emotions that they have.
3.  No matter how hard they try, people can't really change the emotions that they have.
4.  The truth is, people have very little control over their emotions.

**Theories of Personality Scale (TOP)**

Please indicate the extent to which you agree or disagree with each of the following statements.

Strongly Disagree      1      2      3      4      5      6      Strongly Agree

1.  The kind of person someone is is something very basic about them and it can't be changed very much.
2.  People can do things differently, but the important parts of who they are can't really be changed.
3.  Everyone is a certain kind of person and there is not much that can be done to really change that.

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