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REVIEW ARTICLE

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Measuring many mindsets: A systematic review of growth mindset domains, and discussion of domain relationships, with implications for growth mindset interventions

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Abstract

Research into growth mindset, the belief that attributes are malleable, has increased dramatically in the last 30 years, leading to an explosion in the number of mindset domains studied. Given this plethora of mindset domains, there is comparatively little work investigating mindset domain relationships. Further, with expanding interest in growth mindset has come an increase in mindset interventions aimed at increasing growth mindset beliefs, with mixed results. The mindset domain used in intervention messaging is an understudied potential moderator of intervention efficacy, as few domains have been used in interventions, despite the number of domains studied. In this article we raise three questions: (1) How many mindset domains have been studied and what are those domains?; (2) How are beliefs in different mindset domains related to one another?; and (3) How can we use information about existing mindset domains and their relationships to improve mindset intervention efficacy? To address question one, we systematically reviewed the mindset literature between 1995 and 2022 to document studied mindset domains. We then discuss heterogeneity in mindset domain relationship research and suggest how our review can be

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used to address gaps in this field. Lastly, we describe heterogeneity in mindset intervention efficacy and suggest how to apply our review of mindset domains to examine the impact of the domain used in intervention messaging on efficacy. We aim to stimulate research into understanding mindset domain relationships and how this insight may be applied to mindset interventions to improve people's lives through effectively enhancing their growth mindset beliefs.

KEYWORDS
domain general versus domain specific, entity beliefs, growth mindset, implicit beliefs, incremental beliefs, latent variable analyses, mindset domain relationships, mindset domains, mindset interventions, synergistic mindset interventions, systematic review

1 | INTRODUCTION

Be it in sports, business, or the arts, we are often awed by the story of the "natural." We hear phrases such as, "You can't teach that kind of speed." As romantic as this idea is, it misses (and dismisses) the importance of effort and our ability to learn and overcome challenges. This is not to deny that talent exists; however, the biggest success stories often incorporate some form of growth mindset (i.e., the belief that attributes are changeable with effort). This mindset facilitates the perspective that failures are not threats but are opportunities for growth. Alternatively, a fixed mindset, the belief that attributes are unchangeable, encourages the perspective that failure should be avoided as it indicates inadequacy.

Holding a growth mindset is associated with many positive outcomes, such as higher academic performance (e.g., Aronson et al., 2002; Good et al., 2003; Hong et al., 1999), increased wellbeing (Howell, 2016; Romero et al., 2014; Schroder et al., 2017), stronger resilience (Boullion et al., 2021; Rutter, 2006; Schroder et al., 2017), and lower psychological distress (Burnette et al., 2022; Schroder, 2021). Benefits of a growth mindset are also seen at the clinical level in people suffering from psychopathology (Schroder et al., 2019).

Due to the many benefits associated with growth mindset beliefs, growth mindset interventions, which are designed to increase endorsement of growth beliefs, have increased substantially over the last few decades. The first published growth mindset intervention was conducted by Aronson and colleagues in 2002. They showed that presenting information about the malleability of intelligence helped to protect African American students from stereotype threat. Students that received the growth mindset intervention reported more enjoyment of academics, greater academic engagement, and obtained higher grade point averages than students that did not receive the intervention (Aronson et al., 2002). Numerous studies have since employed growth mindset interventions, primarily focusing on improving academic achievement, with varying success (see Burnette et al., 2023; Macnamara & Burgoyne, 2023; Sisk et al., 2018 for reviews). Some interventions show promising results, like the early work of Aronson et al. (2002); however, many growth mindset interventions show little to no positive effects on academic outcomes. Various components of mindset interventions affect their success (Burnette et al., 2023). The mindset domain used in intervention messaging is one component that is currently understudied as a potential moderator of intervention efficacy.

Growth mindset beliefs can be applied to any trait, attribute, emotion, or behavior. The specific quality to which the belief about malleability is applied is referred to as the mindset domain. For example, if one believes that their intelligence is changeable with effort, they have a growth mindset in the domain of intelligence. In addition to the

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burgeoning field of mindset interventions, the study of different mindset domains has increased dramatically over the last 30 years.

Mindset domains vary in specificity, with a mix of broad and specific domains added to the literature almost every year. For example, intelligence was one of the first mindset domains examined (Dweck et al., 1995), and is the most common domain associated with the concept of growth mindset. Subsequent mindset domains studied include broad domains, like malleability of emotions (Tamir et al., 2007) and creativity (O'Connor et al., 2013), as well as more specific domains, like driving ability mindset (Nicolleau et al., 2022) and poster design ability mindset (Cutumisu & Lou, 2020). Given the surge in number and variability of mindset domains studied in the last 3 decades, it is surprising that there is no resource that compiles existing mindset domains; such a resource would help to elucidate the current state of the field and inspire further research questions.

Considering the variability in mindset intervention efficacy, and the proliferation of mindset domains studied, we identified three questions which we aim to inspire research efforts to address.

1) How many mindset domains have been studied and what are those domains?
2) How are beliefs in different mindset domains related to one another?
3) How can we use information about existing mindset domains and their relationships to improve mindset intervention efficacy?

In this article, we address question one through a systematic review of mindset domain studies. We present a table of all mindset domains studied between 1995 and 2022. To stimulate research interest in question two, we discuss studies investigating mindset domain relationships, highlighting gaps in this field and heterogeneity in findings and methods. We suggest how our systematic review of mindset domains may be applied to mindset relationship studies. In reference to question three, we discuss mindset interventions, focusing on moderators of efficacy and the lack of studies using different domains in intervention messaging. We conclude by suggesting how information from our systematic review of mindset domains, and understanding mindset domain relationships, may inform mindset intervention studies to potentially improve efficacy, and thus enhance people's lives.

2 | HOW MANY MINDSET DOMAINS HAVE BEEN STUDIED AND WHAT ARE THOSE DOMAINS? A SYSTEMATIC REVIEW OF GROWTH MINDSET DOMAINS

In early mindset research, the focus was predominantly on the domain of intelligence (Dweck, 2006). In 1995, Dweck and colleagues developed measures to assess different mindset domains, including intelligence, morality, and personality (Dweck et al., 1995). This 1995 article was a seminal work that expanded the concept of mindset to domains other than intelligence. Following Dweck et al.,'s 1995 article, research into different mindset domains exploded. Currently it is difficult to determine which mindset domains have been studied, as mindset domains are often referred to with different terminology, such as implicit or incremental theories. A central purpose of our review is to illustrate the vast number of mindset domains studied, highlight their varying levels of specificity, and provide a resource to easily identify existing mindset domains to stimulate and facilitate further research questions. To achieve these aims, we systematically reviewed the mindset literature between 1995 and 2022.

2.1 | Methods

2.1.1 | Search strategy and inclusion criteria

To conduct our systematic review, we used the databases Web of Science and PsycInfo. The search was conducted in June 2022. We used the following search string: ('Implicit theories' OR 'Implicit beliefs' OR 'Incremental theories'

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OR 'Entity theories' OR 'Growth theories' OR 'Fixed theories' OR 'Growth mindset' OR 'Fixed mindset' OR 'mindset'). We restricted our search to peer-reviewed articles published in English between 1995 and 2022. We chose to begin our search in 1995 because we considered Dweck and colleagues' 1995 article to be a seminal work assessing mindsets about specific attributes other than intelligence. See supplementary materials for full search strategy details.

Four inclusion criteria had to be met. First, a mindset domain must assess one's beliefs about domain malleability (e.g., intelligence mindset; Dweck et al., 1995) or whether a domain is enhancing or debilitating (e.g., stress mindset; Crum et al., 2013). We included this criterion as our goal is to apply our review to mindset intervention studies, and beliefs about malleability or the enhancing nature of traits are the targets for mindset interventions. Second, a mindset domain must assess self-beliefs (i.e., beliefs about an individual's attributes (e.g., intelligence) or identity (e.g., gender)). We did not include domains assessing beliefs about groups (e.g., group mindsets; Rydell et al., 2007) or beliefs about other people's mindsets (e.g., mindsets of others; Spiess & Cooper, 2020). We focused on mindsets of self-beliefs as these beliefs are most relevant to mindset interventions. Third, a domain must be assessed as a stand-alone concept. We did not include domains that were assessed as a collection of domains using one scale (e.g., MDASS; Zhu et al., 2022). This criterion ensures the mindsets we compiled are distinct concepts. Fourth, to avoid redundancy, we included only the earliest reference to each mindset domain.

2.1.2 | Coding procedure

Our search generated 7540 records. 1983 duplicate records were removed. 4712 records were excluded based on a review of the abstract. 845 records were subjected to full-text review. Using Covidence (Covidence Systematic Review Software; www.covidence.org.), seven independent coders assessed records for inclusion criteria. Inclusion required acceptance by two independent coders; conflicts between coders were resolved by the first author. 724 records were excluded after full-text review. A reference analysis was conducted on each full-text article that met inclusion criteria. In this analysis, articles were checked for references to mindset domains that did not appear in our initial search results. Four records were added from this reference analysis. Ultimately, we included 125 articles in our review (Figure 1).

Upon inclusion of a mindset domain, coders extracted the year, mindset type (malleability vs. enhancing), scale type (original or repurposed), number of scale items, an example scale item (where available), and the earliest published reference to that domain.

2.2 | Results

Our systematic review yielded 140 distinct mindset domains (Table 1). Our data show the number of studied mindset domains has dramatically increased over time. The self-related mindset domains studied by Dweck and colleagues in their seminal 1995 article included intelligence, morality, and personality. In the next five years, from 1996 to 2000, five additional mindset domains were studied, including sport ability (Sarrazin et al., 1996) and math ability (Butler, 2000). In the following decade, from 2001 to 2010, 16 additional mindset domains were studied, seven of which were added in 2010. Examples include shyness mindset (Beer, 2002), negotiation style mindset (Kray & Haselhuhn, 2007), and attitude stability mindset (Petrocelli et al., 2010). In the 12 years from 2011 to 2022, 116 new mindset domains were studied, 12 of which were added in the first six months of 2022. Examples include racial bias mindset (Neel & Shapiro, 2012), anxiety mindset (Schroder et al., 2015), general motivation mindset (Ryazanov & Christenfeld, 2018), and self-compassion mindset (Zhang et al., 2021). The exponential growth of

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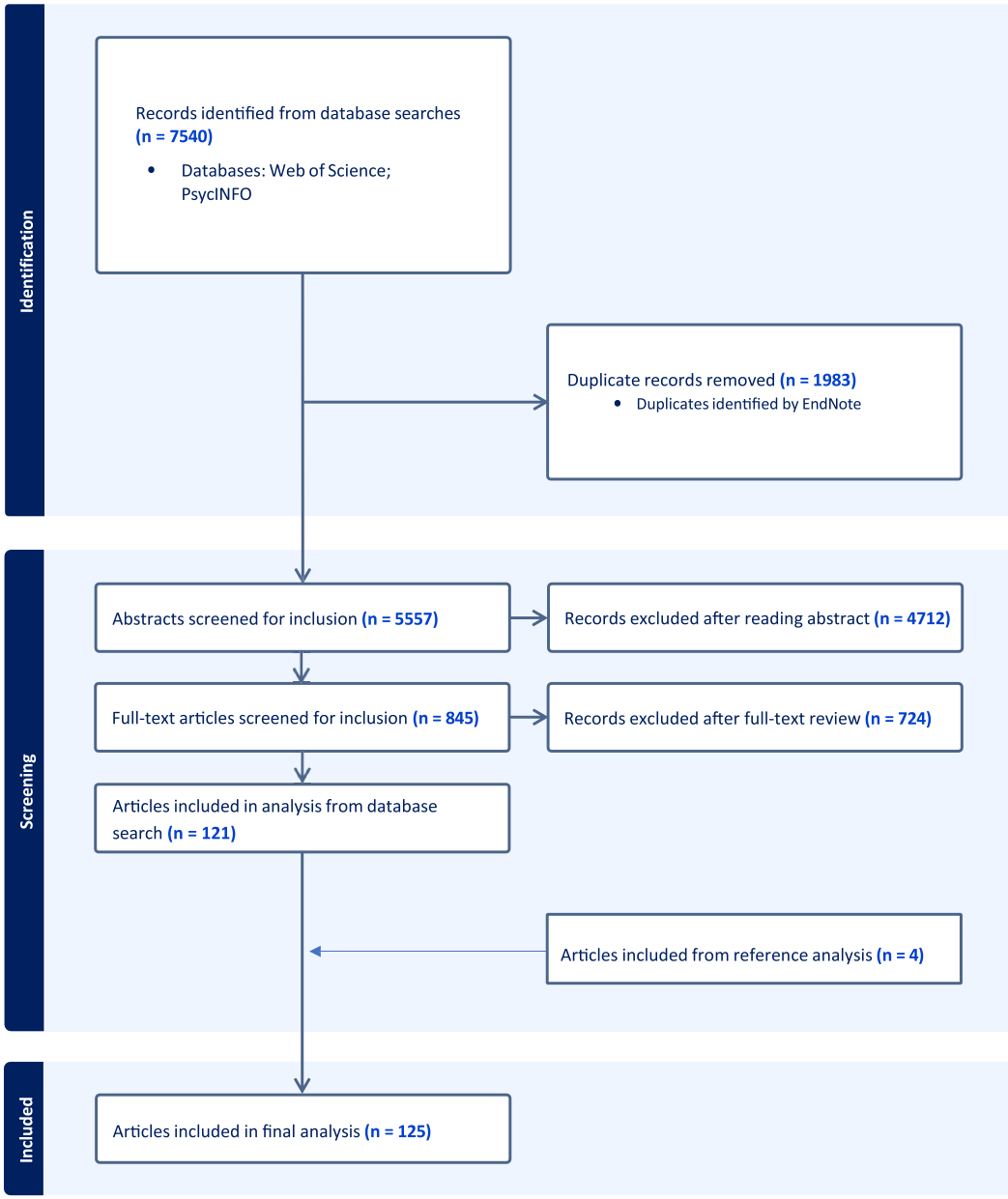

FIGURE 1 Literature search for systematic review.

mindset domains studied over the 28 years examined in our review highlights that mindset research is an active and growing field.

With an increase in mindset domains has come varying levels of domain specificity. For example, intelligence may be thought of as a specific mindset domain when compared to other domains such as morality and personality (Dweck et al., 1995). However, from our review, we see more specific domains studied that likely relate to intelligence, such as math ability (Butler, 2000), school ability (Robins & Pals, 2002), science ability (Chen & Pajares, 2010), reading ability (Moore et al., 2013), memory ability (Plaks & Chasteen, 2013), concentration ability (Hong et al., 2022), etc. When considering these more specific abilities, intelligence appears as a more general

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TABLE 1 Mindset domains studied from 1995 to 2022.

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
1995	Intelligence	Malleability	Original	3	You have a certain amount of intelligence and you really can't do much to change it.	Dweck et al. (1995)
1995	Morality	Malleability	Original	3	There is not much that can be done to change a person's moral traits (e.g., conscientiousness, uprightness, and honesty).	Dweck et al. (1995)
1995	Personality	Malleability	Original	3	The kind of person someone is is something very basic about them and it can't be changed very much.	Dweck et al. (1995)
1996	Sport ability	Malleability	Original	21	One has a certain level in sport, and there is not much one can do to change that.	Sarrazin et al. (1996)
1998	Ethnicity	Malleability	Original	2	Nothing can be changed in the division of humankind into races, nations, and nationalities.	Bacova (1998)
1998	Gender roles	Malleability	Original	4	The relationship between men and woman is natural, given forever and unchangeable.	Bacova (1998)
1998	Romantic relationships	Malleability	Original	4	A successful relationship evolves through hard work and resolution of incompatibilities.*	Knee (1998)
2000	Math ability	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	You have a certain amount of math ability and you really can't do much to change it.	Butler (2000)
2002	School ability	Malleability	Repurposed (Dweck et al., 1995; intelligence)	5	I can change the way I act in academic contexts, but I can't change my true ability level.	Robins and Pals (2002)
2002	Shyness	Malleability	Original	6	My shyness is something about me that I can't change very much.	Beer (2002)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2003	Emotional intelligence	Malleability	Original	4	Emotional intelligence is generally relatively fixed.	Cheng and Hau (2003)
2006	Golfing ability	Malleability	Repurposed (Biddle et al., 2003; athletic ability)	4	You have a certain level of golf putting ability and cannot really do much to change that level.	Spray et al. (2006)
2007	Emotions	Malleability	Repurposed (Dweck, 1999; personality)	4	No matter how hard they try, people can't really change the emotions that they have.	Tamir et al. (2007)
2007	Negotiation style	Malleability	Original	5	Everyone is a certain kind of negotiator and there is not much that can be done to really change that.	Kray and Haselhuhn (2007)
2008	Family relationships	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	My relationship with my parent is something that I cannot really change.	Thompson and Halberstadt (2008)
2008	Racial disposition	Malleability	Original	8	Although a person can adapt to different cultures, it is hard if not impossible to change the dispositions of a person's race.	No et al. (2008)
2009	Physical education ability	Malleability	Repurposed (Biddle et al., 2003; athletic ability)	12	It is difficult to change how good you are at physical education.	Warburton and Spray (2009)
2010	Attitude stability	Malleability	Repurposed (Chiu et al., 1997; personality)	8	A person can do things to cover their attitudes up, but they can't change their real attitudes.	Petrocelli et al. (2010)
2010	Leadership ability	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	To be honest, you can't really change your ability to lead.	Burnette et al. (2010)
2010	Peer relationships	Malleability	Original	12	Kids like you a certain amount and you really cannot do much to change it.	Rudolph (2010)
2010	Science ability	Malleability	Repurposed (Dweck, 1999; intelligence)	6	You have a certain amount of science ability, and you really can't do much to change it.	Chen snd Pajares (2010)
2010	Teaching ability	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	You can't really teach someone how to be a great teacher; great teachers are born, not made.	Thadani et al. (2010)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2010	Weight management	Malleability	Repurposed (Dweck, 1999; personality)	6	To be honest, you can't really change your body weight.	Burnette (2010)
2010	Willpower	Malleability	Original	6	Your mental stamina fuels itself; even after strenuous mental exertion you can continue doing more of it.*	Job et al. (2010)
2011	Friendship	Malleability	Repurposed (Knee, 1998; romantic relationships)	5	The ideal friendship develops gradually over time.*	Canevello and Crocker (2011)
2012	Criminality	Malleability	Repurposed (Dweck, 1995; personality)	3	No matter who I am and how I act, I can always change my ways.*	Gerber & O'Connell 2012
2012	Entrepreneurial ability	Malleability	Repurposed (Dweck, 1999; intelligence)	3	You have a certain amount of entrepreneurial ability, and you can't really do much to change it.	Pollack et al. (2012)
2012	Gaming ability	Malleability	Repurposed (Dweck, 1999; intelligence)	4	You have a certain amount of gaming abilities, and you can't really do much to change it.	Lee et al. (2012)
2012	Managerial ability	Malleability	Repurposed (Dweck, 1999; intelligence)	6	You have a certain amount of managerial ability, and you can't really do much to change it.	Beckmann et al. (2012)
2012	Marital institution	Malleability	Repurposed (Knee et al., 2003; relationships)	8	When you marry, you pretty much agree to become a certain kind of person (like others who are married).	Hall (2012)
2012	Mechanical reasoning	Malleability	Repurposed (Dweck, 1999; intelligence)	6	You have a certain level of mechanical reasoning ability, and you can't really do much to change it.	Reeder et al. (2012)
2012	Racial bias	Malleability	Repurposed (Dweck, 1999; intelligence)	3	People have a certain amount of racial bias and they really can't do much to change it.	Neel and Shapiro (2012)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2012	Speech and voice quality	Malleability	Repurposed (Dweck, 1999; personality)	8	No example items provided.	Wiederhold and Riva (2012)
2013	Career success	Malleability	Original	9	The success of a potential career is destined from the very beginning.	Burnette and Pollack (2013)
2013	Creativity	Malleability	Repurposed (Dweck 1995; intelligence)	5	You have a certain amount of creativity and you really can't do much to change it.	O'Connor et al. (2013)
2013	Memory ability	Malleability	Repurposed (Dweck, 1999; intelligence)	8	No matter how old you are, you can change your memory ability considerably.*	Plaks and Chasteen (2013)
2013	Programming aptitude	Malleability	Repurposed (Dweck, 1999; intelligence)	6	I Have a fixed level of programming aptitude, and not much can be done to change it.	Scott and Ghinea (2013)
2013	Reading ability	Malleability	Repurposed (Dweck, 1999; intelligence)	14	If I am good at reading, then I'll always be good at reading.	Moore et al. (2013)
2013	Self-control	Malleability	Repurposed (Chiu et al., 1997; personality)	5	The amount of self-control someone has is something basic about them, and it can't be changed very much.	Freeman et al. (2013)
2013	Stress	Enhancing/ Debilitating	Original	8	Experiencing stress depletes my health and vitality.	Crum et al. (2013)
2014	Beauty	Malleability	Repurposed (Chiu et al., 1997; personality)	4	Natural beauty does not change much over a lifetime—people who are born beautiful stay beautiful.	Burkley et al. (2014)
2014	Biology ability	Malleability	Repurposed (Dweck, 1999; intelligence)	8	My ability in biology is something that I can't change very much.	Dai and Cromley (2014)
2014	Empathy	Malleability	Repurposed (dweck 1995; personality)	6	Some people are very empathic and some aren't and they can't change that much.	Schumann et al. (2014)
2014	Fate	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	You have a certain fate and you really can't do much to change it.	Kim et al. (2014)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2014	Parenting	Malleability	Repurposed (Levy et al., 1998; person)	8	The kind of parent someone is, is something basic about them, and it can't be changed very much.	Meppelder et al. (2014)
2014	Social anxiety	Malleability	Repurposed (Tamir et al., 2007; emotions)	4	The truth is, I have very little control over my social anxiety.	De Castella et al. (2014)
2014	Social class	Malleability	Original	1	A person's social class/ socioeconomic status is a fixed attribute.	Rheinschmidt and Mendoza-Denton (2014)
2014	Social intelligence	Malleability	Repurposed (Dweck 1995; intelligence)	3	Although I can learn new things, I feel that my social intelligence remains the same.	Leith et al. (2014)
2014	Writing quality	Malleability	Original	3	My texts will always have the same quality, no matter how much I try to change it.	Limpo and Alves (2014)
2015	Anxiety	Malleability	Repurposed (Dweck, 1999; intelligence)	4	You have a certain amount of anxiety and you really cannot do much to change it.	Schroder et al. (2015)
2015	Body type	Malleability	Repurposed (Dweck et al., 1995; intelligence and morality)	6	Everyone has a certain body type and there is not much that can be done to really change that.	Lyons et al. (2015)
2015	Coping with student behavioral problems	Malleability	Repurposed (Dweck 1999; traits)	4	Teachers have a preferred way to cope with behavioral problems, and it is almost impossible to change this.	Inbar-Furst and Gumpel, (2015)
2015	Cultural attributes	Malleability	Repurposed (Dweck 1999; intelligence)	8	Not much can be done to change a person's ethnocultural characteristics (e.g., being violent, being assertive, being submissive).	Chao et al. (2015)
2015	Drug use	Malleability	Repurposed (Dweck, 1999; intelligence)	4	Drug use is something very basic about him and it can't be changed very much.	Neel and Lassetter (2015)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2015	Giftedness	Malleability	Repurposed (Dweck, 1999; intelligence)	6	You can learn new things, but you can't really change your basic giftedness.	Makel et al. (2015)
2015	Language learning ability	Malleability	Repurposed (Dweck, 1999; intelligence)	6	No matter how much language intelligence you have, you can always change it quite a bit.*	Noels and Lou (2015)
2015	Mental skill in sport	Malleability	Repurposed (Dweck, 1999; intelligence)	8	You have a certain amount of mental skill abilities in sport, and you can't really do much to change it.	Shaffer et al. (2015)
2015	Mental toughness	Malleability	Repurposed (Dweck 1995; intelligence)	3	You have a certain degree of mental toughness and you can't really do much to change it.	Gucciardi et al. (2015)
2015	Relationship satisfaction	Malleability	Repurposed (Bohns et al., 2015; sexual attraction)	8	To be honest, you can't really change the relationship satisfaction you have with someone.	Bohns et al. (2015)
2015	Sexual attraction	Malleability	Repurposed (Chiu et al., 1997; pesonality and Dweck 1999; intelligence)	8	To be honest, you can't really change the sexual chemistry you have with someone.	Bohns et al. (2015)
2015	Smoking	Malleability	Repurposed (Dweck, 1999; intelligence)	6	A person's smoking behavior is something that can't be changed very much.	Fitz et al. (2015)
2016	Aging	Malleability	Original	4	No matter at what point in life, you can always influence your own aging.*	Weiss (2016)
2016	Behaviors	Malleability	Original	12	When you don't like the behaviors you have, you can change them.*	Schleider & Weisz 2016
2016	Calmness	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much calm I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Conventional	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much conventional I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2016	Critical nature	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much critical I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Dependability	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much dependable I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Depression	Malleability	Repurposed (Dweck et al., 1995; personality)	4	Your depression is something about you that you cannot change very much.	Schroder et al. (2016)
2016	Disorganized	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much disorganized I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Drinking tendency	Malleability	Repurposed (Dweck et al., 1995; personality)	4	Your tendency to drink is something about you that you cannot change very much.	Schroder et al. (2016)
2016	Extraversion	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much Extraverted I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Failure	Enhancing/ Debilitating	Repurposed (Crum et al., 2013; stress)	6	Experiencing failure inhibits my learning and growth.	Haimovitz and Dweck (2016)
2016	Intuition	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much intuitive I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Kindness	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How kind I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Openness to experience	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much open to new experiences I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Perceptions of self	Malleability	Repurposed (Spencer-Rodgers et al., 2004; dialectical thinking scale)	8	I often change the way I am, depending on who I am with.*	Rabinovich and Morton (2016)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2016	Reserved	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much reserved I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Selling ability	Malleability	Repurposed (Dweck, 1999; intelligence)	8	When it comes to selling, you have a certain selling ability, and you can't really do much to change it.	Novell et al. (2016)
2016	Sexual offending behavior	Malleability	Repurposed (Dweck et al., 1995; personality	3	Whether somebody commits a sexual crime is very much related to who they are as a person.	Harper and Bartels (2016)
2016	Sexuality	Malleability	Repurposed (Knee et al., 2003; relationships)	14	It takes a lot of time and effort to cultivate a good sexual relationship.*	Maxwell et al. (2016)
2016	Strengths	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How (self-generated strength) I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Sympathetic	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How much sympathetic I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Thoughts	Malleability	Original	12	When you don't like the thoughts you have, you can change them.*	Schleider and Weisz (2016)
2016	Weaknesses	Malleability	Repurposed (Dweck et al., 1995; personality)	3	How (self-generated weakness) I am is something very basic about me and it cannot be changed very much.	Steimer and Mata (2016)
2016	Wellbeing	Malleability	Repurposed (Dweck, 1999; intelligence)	8	You have a certain amount of wellbeing, and you can't really do much to change it.	Howell (2016)
2017	Fresh start ability	Malleability	Repurposed (Dweck et al., 1995; personality)	6	Anyone can make a new start if they want to.*	Price et al. (2017)
2017	Muscle strength	Malleability	Repurposed (Sarrazin et al., 1996; athletic ability)	6	One has a certain level of muscle strength, and there is not much one can do to change that.	Emile et al. (2017)
2017	Public speaking ability	Malleability		4	No matter how many speeches I give, their	Stewart et al. (2017)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
			Repurposed (Dweck, 1999; intelligence)		quality will always be the same.	
2017	Sexual life	Malleability	Repurposed (Dweck, 1999; intelligence)	5	You have a certain type of sexual life and you really can't do much to change it.	Bőthe et al. (2017)
2018	Aggression	Malleability	Repurposed (Schumann et al., 2014; empathy)	6	A person's level of aggresssion is something very basic about them, and it can't be changed much.	Ryazanov and Christenfeld (2018)
2018	Art ability	Malleability	Repurposed (Biddle et al., 2003; athletic ability)	12	You have a certain level of ability in art, and you cannot really do much to change that level.	Wang et al. (2018)
2018	Brain ability	Malleability	Repurposed (Dweck, 1999; intelligence)	6	No matter who you are, you can change your brain abilities a lot.*	Babinski et al. (2018)
2018	Fitness	Malleability	Repurposed (Burnette, 2010; weight management)	6	To be honest, you can't really change your ability to be fit.	Orvidas et al. (2018)
2018	Gambling behavior	Malleability	Repurposed (Dweck et al., 1995; personality)	3	People have a predisposition to develop certain gambling habits and they really can't do much to change it.	Salmon et al. (2018)
2018	Happiness	Malleability	Repurposed (Dweck 1999; intelligence)	4	No matter who you are, you can significantly change your happiness.*	Van Tongeren and Burnette (2018)
2018	Interest development	Malleability	Repurposed (Dweck, 1999; intelligence)	4	To be honest, your core interests will remain your core interests. They won't really change.	O'Keefe et al. (2018)
2018	Motivation (general)	Malleability	Repurposed (Schumann et al., 2014; empathy)	6	A person's level of motivation is something very basic about them, and it can't be changed much.	Ryazanov and Christenfeld (2018)
2018	Self-regulation	Malleability	Repurposed (Dweck, 1999; intelligence)	8	Your self-regulation is something about you that you can't change very much.	Mrazek et al. (2018)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2018	Social Competence	Malleability	Repurposed (Dweck, 1999; intelligence)	4	You have a certain amount of social competence and you really can't do much to change it.	Taniguchi (2018)
2018	STEM ability	Malleability	Repurposed (De Castella & Byrne 2015; intelligence (self-theory))	7	To be honest, I don't think I can really change my STEM aptitude.	van Aalderen-Smeets et al. (2018)
2019	Addiction	Malleability	Original	6	Some people will always be addicted, and there's not much they can do about it.	Sridharan et al. (2019)
2019	Communication skills	Malleability	Repurposed (Dweck, 1999; intelligence)	8	You have a certain amount of communication skills, and you can't really do much to change it.	Nordin and Broeckelman-Post (2019)
2019	Competition	Enhancing/ Debilitating	Original	18	Competition makes people perform better.*	Kesebir et al. (2019)
2019	Computer science ability	Malleability	Repurposed (Sun 2015; math)	3	Computer science involves mostly facts and procedures that have to be learned.*	Lodi (2019)
2019	Health	Malleability	Repurposed (Burnette, 2010; weight management)	4	No matter who you are, you can significantly change your health.*	Thomas et al. (2019)
2019	Life satisfaction	Malleability	Repurposed (Dweck, 1999; intelligence)	8	I have a certain amount of life satisfaction and I can't really do much to change it.	Busseri and Samani (2019)
2019	Loyalty/ Trustworthiness	Malleability	Repurposed (Dweck et al., 1995; morality)	6	Whether you are loyal and trustworthy as a friend is something that is deeply ingrained into your personality. It can't really be changed.	Lavallee and Parker (2019)
2019	Musical ability	Malleability	Repurposed (Dweck, 1999; intelligence)	8	You have a certain amount of musical ability, and you can't really do much to change it.	Burgoyne et al. (2019)
2019	Pain	Malleability	Repurposed (Dweck 1999; intelligence)	8	Your pain is something about you that you can't change very much.	Summers et al. (2019)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2019	Teaching with E-Learning tools ability	Malleability	Original	3	I can improve using e-learning tools by paying more efforts.*	Bai et al. (2019)
2020	Alcoholism	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	If you are an alcoholic, you can't really do much to change it.	Lindgren et al. (2020)
2020	Clinical reasoning	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	A person's clinical reasoning ability is something about them that they can't change very much.	Pal et al. (2020)
2020	Compassion	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	Whether a person is warm or not is deeply ingrained in their personality. It cannot be changed very much.	Pal et al. (2020)
2020	Dementia	Malleability	Original	12	Family and care professionals cannot change that persons with dementia are often insecure because they have a hard time doing things by themselves.	Kunz et al. (2020)
2020	Engineering aptitude	Malleability	Repurposed (Dweck, 1999; intelligence) and original items	6	You can learn new things about engineering, but you can't really change how smart you are at engineering.	Lottero-Perdue and Lachapelle (2020)
2020	Innovation level	Malleability	Repurposed (Karwowski, 2014; creativity)	4	People are either innovative or they are not. Even trying very hard you cannot change much.	Perignat and Meloche (2020)
2020	Networking ability	Malleability	Original	3	How well you network is mostly a matter of personality, and you can't change it very much.	Kuwabara et al. (2020)
2020	Physics ability	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	Everybody has a certain amount of physics ability that can be changed*/ cannot be changed.	Zeeb et al. (2020)
2020	Poster design ability	Malleability	Repurposed (Dweck, 1999; intelligence)	4	You cannot really change your abilities to design posters.	Cutumisu and Lou (2020)
2020	Talent	Malleability	Repurposed (Dweck et al., 1999; intelligence)	8	You have a certain amount of talent and you really can't do much to change it.	Buenconsejo and Datu (2020)

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2021	Chemistry aptitude	Malleability	Repurposed (De Castella & Byrne, 2015; intelligence)	4	My chemistry intelligence is something about me that I can't change very much.	Santos et al. (2021)
2021	Global ability	Malleability	Repurposed (Dweck, 1999; intelligence)	7	Your abilities are fixed, and you really can't do much to change them.	Lewis et al. (2021)
2021	Mind wandering	Malleability	Repurposed (Dweck, 1999; intelligence)	12	Even in moments when it really matters, I can't do much to keep my mind from wandering.	Zedelius et al. (2021)
2021	Self-compassion	Malleability	Repurposed (Dweck, 1999; intelligence)	8	To be honest, I don't think I can really change how self-compassionate I am.	Zhang et al. (2021)
2021	Self-regulated learning	Malleability	Repurposed (Dweck et al., 1995; intelligence) and original items.	6	Everyone has a certain ability to self-regulate their learning and this cannot be changed.	Hertel and Karlen (2021)
2021	Self-tracking behavior	Malleability	Repurposed (De Castella et al., 2014; intelligence)	8	To be honest, I do not think I can really change my behavior with a self-tracking device.	Hancı et al. (2021)
2021	Spatial intelligence	Malleability	Repurposed (Dweck et al., 1999; intelligence)	4	You have a certain amount of spatial intelligence, and you can't really do much to change it.	Goldstein et al. (2021)
2021	Technology	Malleability	Repurposed (Dweck et al., 1999; intelligence)	7	No items provided.	Lewis et al. (2021)
2022	Appearance	Malleability	Repurposed (De Castella & Byrne, 2015; intelligence)	8	I do not think I personally can do much to enhance my appearance.	Sung and Chattaraman (2022)
2022	Concentration ability	Malleability	Repurposed (Yeager & Dweck, 2012; intelligence)	6	I can learn new things, but it is impossible to change my concentration ability.	Hong et al. (2022)
2022	Driving ability	Malleability	Original	8	It is difficult to change your skill level (in driving).	Nicolleau et al. (2022)
2022	Human minds	Malleability	Repurposed (Schumann et al., 2014; empathy)	6	Human mind is something very basic about humans and it cannot be changed much.	Dang & Liu 2022

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TABLE 1 (Continued)

Year	Mindset domain	Mindset type	Scale	Number of items	Example items (*growth mindset item)	Author(s)
2022	Information literacy	Malleability	Repurposed (Bai et al., 2019; information and communication technology)	3	I believe that I can improve my IL ability by putting more effort into it.*	Liu et al. (2022)
2022	Motivation (intrinsic and Extrinsic)	Malleability	Repurposed (Dweck, 1999; intelligence and Tamir et al., 2007; emotion)	8	You cannot influence how exciting the learning is (intrinsic). You can influence how much the learning material means to you (extrinsic).*	Trautner and Schwinger (2022)
2022	Nursing ability	Malleability	Repurposed (Dweck et al., 1995; intelligence)	3	Becoming a nurse is something you cannot really change.	Lewis et al. (2022)
2022	Opportunity	Malleability	Repurposed (Dweck, 1999; intelligence)	3	You may be a person with many good opportunities; you may be a person with few. You can't do much to change that.	O'Keefe et al. (2022)
2022	Popularity	Malleability	Original	4	Their popularity is dependent on their friendliness or overall behavior towards others.*	Devos et al. (2022)
2022	Relationships	Malleability	Original	3	My relationship with others can improve quite a bit with my effort.*	Chan et al. (2022)
2022	Self-doubt	Enhancing/ Debilitating	Repurposed (Crum et al., 2013; stress)	8	Experiencing self-doubt debilitates my performance and productivity.	Zhao and Chang (2022)
2022	Singing ability	Malleability	Repurposed (Dweck et al., 1999; intelligence)	4	You have a certain amount of singing talent, and you can't do much to change it.	Adams (2022)

Note: Domains are organized chronologically by publication date. Mindset Type: Refers to beliefs about either malleability (e.g., Dweck et al., 1995) or whether a domain is enhancing/debilitating (e.g., Crum et al., 2013). Scale: Refers to whether the mindset items used to measure the domain were original items developed by the authors of that paper or repurposed items from an existing mindset scale (e.g., the repurposed musical mindset scale uses previously published items and replaces the word 'intelligence' with 'musical ability'). Number of Items: Refers to the number of items in the scale used to measure the mindset domain. Example Items: Where available, examples of items from the mindset scale are listed (*indicates a growth-focused item). Not all papers provided example scale items.

mindset domain. Our review shows a mix of both general mindset domains (e.g., talent mindset; Buenconsejo & Datu, 2020) and more specific mindset domains (e.g., nursing ability; Lewis et al., 2022) added to the literature over time; however, many more specific (vs. general) domains are added each year.

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2.3 | Conclusions

With our review, we have answered our first question: How many mindset domains have been studied and what are those domains? We identified 140 mindset domains with varying degrees of specificity. By providing a list of existing mindset domains, we hope to encourage new and nascent avenues of research focused on examining the other two questions we raised, namely: How are beliefs in different mindset domains related to one another? and How can we use information about existing mindset domains and their relationships to improve mindset intervention efficacy? To stimulate research interest in our second question, we now discuss studies examining relationships among mindset domains.

3 | HOW ARE BELIEFS IN DIFFERENT MINDSET DOMAINS RELATED TO ONE ANOTHER? A DISCUSSION OF SELECT STUDIES USING LATENT VARIABLE ANALYSES TO INVESTIGATE MINDSET DOMAIN RELATIONSHIPS

In this section, we discuss studies using latent variable modeling techniques (primarily factor analysis) to examine mindset domain relationships (i.e., if one holds growth beliefs in one domain, do they also hold growth beliefs in other domains, and if so, in which other domains?). Latent variable analyses, such as exploratory and confirmatory factor analyses, have been used in mindset research since the mid-1990s to investigate the specificity versus generality of mindset domains (e.g., Dweck et al., 1995). Important to our second question, these analyses are used for data reduction and identifying underlying relationships among variables (Bartholomew et al., 2011).

Given the number of mindset domains we identified, there is comparatively little research examining relationships among mindset domains. The lack of research in this area may relate to the relatively recent proliferation of mindset domains. A sizeable increase in mindset domains occurred in the last decade, with 107 of the 140 domains we identified first studied between 2013 and 2022. As mindset domain numbers increase, interest in how those domains relate has grown. Although the current body of mindset domain relationship literature is small, there is considerable heterogeneity in both findings and methods.

What follows is a non-exhaustive discussion of a selection of studies using latent variable analyses to investigate relationships among mindset domains. The studies included in this discussion were chosen to highlight the diversity of methods used in this field and to illustrate how different methods may contribute to contradictory findings.

3.1 | Are mindset beliefs domain general or domain specific? Heterogeneity in mindset domain relationship findings

Findings from latent variable analyses of mindset domains are mixed. Originally, Dweck et al. (1995) argued for the specificity of mindset domains, finding that intelligence, morality, and personality beliefs were distinct. These results are supported by work from Zhu et al. (2022), who studied the domains of depression, anxiety, and stress, and Chan et al. (2022), who studied the domains of intelligence, ability, personality, and relationships. In both cases, the authors report that each domain they included is distinct, comprising its own factor. These results suggest that one may hold growth beliefs in one domain and fixed beliefs in a different domain. In contrast, Cheng and Hau (2003), who examined the domains of intelligence, personality, creativity, emotional intelligence, and morality, and Lewis et al. (2021), who examined the domains of intelligence, personality, health, writing ability, technology, math ability, science ability, and athletic ability, report evidence for both domain specificity and generality (i.e., a bifactor model). However, it should be noted that authors of both studies argue for a one-factor model as the stronger model (i.e., a domain general mindset). Lastly, some researchers find that specific mindset domains cluster into latent factors that

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are distinct from other factors. For example, Schroder et al. (2016) report three factors: Mental Health Mindset (comprised of the domains of anxiety, social anxiety, depression, drinking tendencies, and emotions), Intelligence Mindset, and Personality Mindset. Similarly, Zhu et al. (2020) report three factors: Intelligence Mindset, Personality Mindset, and a factor comprised of the domains of cognition, feeling, behavior, and emotion. In these examples, we see that the same mindset domain (e.g., intelligence, personality, anxiety, depression) is sometimes reported as a distinct domain and sometimes reported as part of a factor and strongly related to other domains. Currently there is little consistency in understanding mindset domain relationships. Heterogeneity in mindset domain relationship findings may be partially influenced by heterogeneity in the methods used to examine these relationships, primarily in the mindset domains chosen for analysis and the type of analysis used (i.e., model structures tested).

3.2 | Heterogeneity in mindset domain relationship analysis methods

3.2.1 | Choice of mindset domains

The domains researchers choose to include in their mindset domain relationship analyses are only a small fraction of the mindset domains that have been studied. For example, in one of the largest studies of mindset domain relationships, Lewis et al. (2021) included eight specific domains plus a measure of "global" mindset. In contrast, Zhu et al. (2022) included only three domains in their analysis. Given the impressive number of mindset domains that have been examined, it is surprising that so few domains are included in analyses of mindset domain relationships.

The choice of mindset domains to include in analyses seems both specific and arbitrary. For example, Zhu et al. (2022) chose the mindset domains of depression, anxiety, and stress because they were interested in developing a measurement scale for mindset domains related to mental health outcomes. In contrast, Lewis et al. (2021) sought to examine mindset beliefs across a range of ability domains to explore the question of whether mindset beliefs are domain general or domain specific. Their choice of domains appears more arbitrary, as four of the eight included domains seem on the surface to be conceptually similar (i.e., intelligence, technology, math ability, science ability). Choice of domains will influence conclusions regarding whether mindset beliefs are domain general or domain specific. Including more conceptually distinct domains (e.g., sexuality, parenting, criminality, creativity) may alter arguments for a one-factor model to arguments for a multi-factor model. Given the number and variability of mindset domains we report in our review, it is important for researchers to consider a broad range of domains in analyses aimed at establishing whether a global (i.e., domain general) mindset exists, which is an ongoing question in the mindset literature.

3.2.2 | Type of analysis

Further heterogeneity in mindset domain relationship findings stem from the type of analysis used. Some researchers use first-order factor analysis (i.e., examining how items load onto factors; e.g., Dweck et al., 1995). These analyses are often used to validate mindset scales or assess domain specificity versus generality. Other researchers use higher-order factor analysis (i.e., examining how items load onto factors and how factors correlate, or how items load onto both distinct and general factors; e.g., Lewis et al., 2021). These analyses can describe more nuanced domain relationships. Different analyses can yield different results for the same mindset domains, suggesting that domains may be both specific and general, depending on the analysis used.

Although predominantly item-level factor analyses are used in mindset research, there are instances in other fields when factor analysis is conducted at the scale-level (e.g., for the Personality Assessment Inventory, which has 22 scales; Deisinger, 1995). As we propose increasing the number of mindset domains included in latent variable analyses, researchers may consider using scale-level analyses to examine domain relationships. Here we provide an

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important consideration for scale-level analyses specific to mindset research. Some mindset domain scales include both growth and fixed items (see 'Example Items' in Table 1). It has been argued that scales with only fixed items better represent individuals' true levels of growth mindset, as growth items are very compelling and draw more agreement (Dweck et al., 1995). If scale-level analyses are used, the strength of relationship between scales that contain only fixed items and those that contain both growth and fixed items may be skewed. Scales with growth items may have inflated scores compared to scales with only fixed items, thus making relationships between domains appear weaker than they really are. This point is an empirical question to consider if examining scale-level mindset domain relationships.

3.3 | Conclusions

Variability in choice of mindset domains to include in analyses, and type of analysis, help explain why some studies find that a mindset domain is distinct, while other studies find the same mindset domain is closely related to other domains. It stands to reason that studies including conceptually more similar domains (e.g., intelligence, math ability, science ability) will show stronger relationships than studies comparing conceptually more distinct domains (e.g., intelligence, personality, relationships). In addition, when the focus of analysis is which questions are more strongly related (i.e., item-level analysis), questions about the same mindset will likely be more related than questions about even conceptually similar mindsets, making conceptually similar mindsets appear more distinct.

3.4 | Future directions in mindset domain relationship research

With our systematic review of mindset domains, we aim to facilitate further research into mindset domain relationships. Researchers can consult our table of mindset domains to choose domains to include in latent variable analyses that will elucidate a larger picture of mindset domain relationships. This picture will likely reveal different factors of related domains. One potential organization is factors related to skills/ability (e.g., intelligence, creativity, athletics, public speaking), emotions (e.g., emotions, anxiety, stress, depression, emotional intelligence), behaviors (e.g., addiction, drinking tendency, drug use, smoking, gambling behavior), and personality (e.g., morality, shyness, extraversion, calmness). However, this organization remains an empirical question.

We believe understanding the relationships among mindset domains may provide valuable insights that can be applied to mindset interventions. To illustrate this point, we now turn to a discussion of mindset intervention efficacy, with a focus on factors impacting efficacy and the lack of variability in mindset domains used in mindset intervention messaging.

4 | HOW CAN WE USE INFORMATION ABOUT EXISTING MINDSET DOMAINS AND THEIR RELATIONSHIPS TO IMPROVE MINDSET INTERVENTION EFFICACY? A DISCUSSION OF FACTORS IMPACTING GROWTH MINDSET INTERVENTION EFFICACY

The substantial advantages associated with having a growth mindset encouraged research into growth mindset interventions. To date, most growth mindset interventions focus on improving academic outcomes, with varying levels of success. For example, in a recent systematic review and meta-analysis, Macnamara and Burgoyne (2023) examined 63 studies of growth mindset interventions on academic performance and concluded that effects were non-significant. In another meta-analysis, Sisk et al. (2018) examined 29 studies and 43 effect sizes. They found that 86% of effect sizes were not significantly different from zero, suggesting no increase in academic performance following the intervention. Further, a systematic review and meta-analysis by Burnette et al. (2023) supports

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conclusions drawn by Sisk et al. (2018) regarding small effect sizes when intervention studies are averaged together. These reviews seem to paint a grim picture of mindset intervention efficacy.

Although when effects are averaged there seem to be small, if any, benefits from growth mindset interventions, further examination of moderating factors highlight where and when these interventions are most impactful. For example, both Sisk et al. (2018) and Burnette et al. (2023) found that intervention effects were stronger in lower-achieving students and students from low SES backgrounds. In support of this point, Yeager et al. (2019) studied a nationally representative sample of 6320 students. They showed small but significant increases in GPA for lower-achieving students who received a short, scalable online growth mindset intervention. Further, Burnette et al. (2023) and Yeager et al. (2019) both emphasize that the context in which growth mindset interventions are delivered can influence success. Yeager et al. (2019) found stronger effects of their intervention in schools where peer norms supported challenge-seeking. In addition to population and context, the target outcome of an intervention affects efficacy. For example, Burnette et al. (2023) found that the average effects of mindset interventions on mental health outcomes ($d = 0.32$) and social functioning outcomes ($d = 0.36$) were substantially higher than those reported for academic achievement outcomes ($d = 0.14$). Lastly, Burnette et al. (2023) highlight the variability in implementation practices for mindset interventions. There is currently no standardized protocol to deliver a mindset intervention. Heterogeneity in how interventions are implemented contributes to heterogeneity in outcomes. Clearly multiple factors influence mindset intervention efficacy, including population, context, target outcomes, and implementation practices.

Given the variability in mindset intervention efficacy, and the potential for successful mindset interventions to improve quality of life, it is essential to continue research aimed at improving mindset interventions through identifying and optimizing moderating factors. To address our final question, we suggest how our systematic review of mindset domains, and how understanding mindset domain relationships, may help improve intervention efficacy through investigation of an understudied potential moderator, the mindset domain used in intervention messaging.

4.1 | How can our systematic review of mindset domains help to improve mindset intervention efficacy? Mindset domain as an understudied moderator of efficacy

Although many moderators of growth mindset intervention efficacy have been studied, there is little to no mention of the mindset domains used in intervention messaging as a potential moderator. In their meta-analysis, Burnette et al. (2023) identify the type of mindset domain used in the interventions. 91.2% of interventions targeting academic achievement used intelligence mindset, interventions targeting mental health outcomes used either personality mindset (7 studies) or emotion mindset (1 study), and all seven interventions targeting social functioning used personality mindset. Burnette et al. (2023) briefly mention that intervention effects may be influenced by the mindset domain used; however, they do not analyze data to address this question because most interventions targeting the same outcomes use the same mindset domain. However, this point is supported by Burnette and colleagues' (2020) work examining relationships between mindsets in different domains (intelligence, personality, and emotions) and mental health variables (psychological distress and use of active coping strategies). Regardless of domain, a stronger growth mindset was associated with less psychological distress. There were, however, differences in the strength of relationship across domains, with emotion growth mindset showing the strongest relationship with reduced distress. In contrast, personality mindset was most strongly related to the use of active coping strategies. These findings suggest that targeting the mindset domain most strongly related to the outcome of interest may yield the best intervention results. To support mindset intervention work, researchers can examine our table of mindset domains to identify domains relevant to an outcome of interest and examine differences in relationship strength between domains and outcomes to determine which domain may be most impactful in intervention messaging.

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In addition to mindset beliefs affecting target outcomes of interventions, Burnette et al. (2023) highlight that there are intervening outcomes between beliefs that an attribute is malleable and target outcomes, such as persistence and goal-directed behavior. Interventions have the strongest effects on the most proximal outcomes (i.e., changing mindset beliefs) and weaker effects on more distal outcomes (e.g., academic performance). Burnette et al. (2023) recommend that researchers specify and measure the intervening cognitive and behavioral processes operating between mindset beliefs and target outcomes. We support and extend this recommendation by suggesting that researchers not only specify and measure intervening outcomes but also include messaging about mindset domains relevant to those intervening outcomes in the intervention. For example, to improve academic performance, it is not only beneficial to believe that intelligence is malleable, but it is likely also important to believe that one's level of persistence, procrastination, and time management skills can change with effort. Researchers can examine our Table 1 to both identify mindset domains that may be relevant to intervening outcomes to include in their interventions and to identify gaps where additional mindset domains may be studied.

4.2 | How can understanding mindset domain relationships help to improve mindset intervention efficacy? Combining multiple domains in intervention messaging as an understudied moderator of efficacy

Inherent in our suggestion about including mindset domains relevant to intervening outcomes in intervention messaging is the idea of providing messaging about multiple domains in a single mindset intervention. Currently almost all mindset interventions provide messaging about a single domain (e.g., intelligence, personality, emotions). Thus, combining messaging about multiple domains is an understudied potential moderator of intervention efficacy.

The integration of multiple mindset domains into a single intervention was recently used by Yeager et al. (2022), who examined the effect of a synergistic mindset intervention on outcomes such as student anxiety, psychological well-being, and academic success. In their intervention, they combined information about the malleability of the general mindset domain of ability with information that stress can be enhancing instead of debilitating (i.e., stress mindset; Crum et al., 2013). Intervention results were stronger when mindset domains were combined compared to presenting information about malleability or stress-is-enhancing mindset alone.

In Yeager et al.'s (2022) study, they used messaging about two different mindsets; however, these mindsets address different facets (malleability and enhancing vs. debilitating). It is unclear if the same synergistic effect would be seen when combining messaging about mindsets that focus on the same facet of malleability but across different domains. We thus encourage researchers to address multiple questions aimed at determining how combining multiple malleability mindsets in one intervention impacts efficacy. First, is a mindset intervention more impactful if messaging is provided about multiple strongly related domains? If beliefs in a set of domains are strongly correlated, is it more impactful to attempt to modify beliefs on all the related domains at once through intervention messaging versus focusing on a single domain? Would this type of presentation increase the strength of the malleability message? Second, if domains cluster into a factor, is it more impactful to present information about a broader factor versus the specific domain relevant to the outcome of interest? For example, if domains like writing ability, math ability, and science ability load onto a more general "ability" factor, is it more impactful to present general messaging about the malleability of "ability" versus the specific domain of writing ability if the target of an intervention is persistence through writing challenges? Yeager et al. (2022) presented messaging about the malleability of the general domain of "ability" in their synergistic intervention; however, this messaging was not contrasted with more domain-specific messaging to determine the effect on efficacy. Third, is it more impactful to present intervention messaging about strongly related domains, or to present messaging about domains that are more distantly related? Presenting information about more distantly related domains, and highlighting how all domains are malleable, may be more impactful for producing a global shift in mindset beliefs, thus impacting a

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broader range of outcomes from an intervention rather than a very targeted intervention, where one may need a different intervention for each outcome of interest.

The questions we pose in this section will be facilitated with a stronger understanding of mindset domain relationships. A stronger understanding of mindset domain relationships will be facilitated by our systematic review of mindset domains that have thus far been studied.

5 | CONCLUSION

We have shown that, while the field of mindset research is robust and multi-faceted, there are still areas of study that are under-focused. We identified and discussed three key questions to help stimulate research in these areas. We presented a systematic review of mindset domains to provide a resource of existing domains in the literature. We discussed the importance of studying mindset domain relationships, and how our systematic review will aid this research area. Lastly, we highlighted how integrating the fields of mindset relationship and mindset intervention research may yield insights that enhance mindset intervention efficacy. Maximizing intervention efficacy has the potential to improve important outcomes, such as academic performance, mental health, and social functioning. With this article, we hope to encourage and facilitate greater research synergy in the areas of mindset domain relationships and mindset interventions to enhance people's lives.

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CONFLICT OF INTEREST STATEMENT

Both authors declare no conflicts of interest.

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