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Implicit Theories (Mindsets) of Malleability Shape Intergroup Relations

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Abstract

This review argues that implicit theories of malleability are essential constructs for the study of intergroup dynamics. As one of people's core meaning-making tools, mindsets about malleability shed light on the mechanisms behind perceivers' tendency to stereotype and feel prejudiced towards targets, as well as on the mechanisms underlying targets' ability to shield against, and potentially confront, perceivers' social bias. In addition to illuminating cross-group interaction dynamics between individuals, mindsets contribute to explaining the harmful processes at play in real-world protracted conflicts, and suggest interventions that may help lay the ground for peace processes. This review also aims to highlight areas of research that remain open for further investigation, or that have been overlooked to date. We argue that research integrating mindsets and intergroup relations will advance to our understanding of intergroup dynamics, as well as possibly offering insights on how to improving them, and that this approach will also further the study of lay theories of malleability.

Implicit Theories (Mindsets) of Malleability Shape Intergroup Relations

Do you believe that people's core characteristics are malleable and can change? Or do you believe that they are fixed and stable over time? Why would your answers to these questions relate to your propensity to exhibit stereotyping and prejudice, as well as your responses to these intergroup dynamics? Historically, the study of intergroup relations has viewed beliefs about, and attitudes toward, *specific* groups as the focal constructs for explaining intergroup dynamics (Allport, 1954; Cardwell, 1996; Dovidio, Hewstone, Glick, & Esses, 2013; Goffman, 1963; Tajfel & Turner, 1979). From this perspective, *generalized* lay beliefs about malleability, which by definition are not linked to specific group identities, are seemingly irrelevant. However, evidence suggests that people's lay beliefs about malleability drive core intergroup dynamics: the expression of stereotyping and prejudice among perceivers, and responses to these forms of bias among targets. The purpose of this review is to integrate and summarize this body of work linking mindsets about malleability and people's expression of, as well as responses to intergroup bias. In doing so, we hope to foster interest in further research integrating a lay theories approach into the study of intergroup relations.

What are implicit theories (or mindsets) about malleability?

People's beliefs about the malleability of human characteristics (e.g., intelligence, personality, etc.) represent their lay theories, implicit theories, or mindsets (terms that we will use interchangeably; Dweck, 1999). Some people view human characteristics as fixed and stable, an "entity theory" or "fixed mindset," whereas others view characteristics as malleable and able to change over time, an "incremental theory" or "growth mindset". These beliefs, which may or may not be accurate, are people's non-scientific understandings of the world, developed through experience and interactions with others (Hong, Chiu, Dweck, Lin, & Wan,

1999; Weiner, 1985; Weiner, Heckhausen, & Meyer, 1972). Lay theories are at the core of people's meaning systems, i.e., the cognitive structures that help people to sort and make sense of the complex volume of social information that they encounter in the world (Heider, 1958; Kelly, 1955; Piaget, Garcia, Davidson, & Easley, 1983). Because lay theories are descriptive and prescriptive (Plaks, Levy, & Dweck, 2009), they shape how people interpret experiences, construct explanations, and form expectations.

To measure lay theories, people are asked to report agreement or disagreement with statements such as, "Everyone is a certain kind of person, and there is not much that they can do to really change that," ("kind of person" lay theories; Dweck, 1999; Dweck, Chiu, & Hong, 1995), "Someone's personality is a part of them that they can't change very much," ("personality" lay theories; Dweck, 1999; Dweck et al., 1995) or, "You can learn new things, but you can't really change your basic intelligence," ("intelligence" lay theories; Dweck, 1999; Dweck et al., 1995). Agreeing with these statements suggests that one believes that people's core attributes cannot change, which indicates an "entity theory" or "fixed mindset"; disagreeing with these statements suggests the belief that people's core attributes can change, known as an "incremental theory" or "growth mindset". These labels highlight which side of the normally-distributed continuum people fall toward (i.e., are not used as indicators of personality types; Dweck, 1999). Researchers have also experimentally manipulated these beliefs using seemingly scientific news articles proclaiming either that attributes are fixed or malleable (Bergen, 1991; Chiu, Hong, & Dweck, 1997), or with biased questionnaire manipulations that subtly encourage participants to express agreement with a target theory (Job, Dweck, & Walton, 2010; Rattan, Savani, Naidu, & Dweck, 2012).

Lay theories are domain-specific, meaning that people need not – and often do not – hold the same fixed-growth beliefs across domains (Dweck et al., 1995; Levy, Plaks, Hong, Chiu, & Dweck, 2001). As we describe in the next sections, mindsets ranging from the

broader “kind of person” and personality theories (Chiu et al., 1997; Dweck, 1999) to specific domains, such as intelligence (Dweck et al., 1995; Dweck & Leggett, 1988) and prejudice (Carr, Dweck, & Pauker, 2012; Neel & Shapiro, 2012), to beliefs about the malleability of groups (Halperin, Russell, Trzesniewski, Gross, & Dweck, 2011; see also Rydell, Hugenberg, Ray, & Mackie, 2007) and the world (Dweck et al., 1995) have been found to be predictive of different intergroup outcomes (see Figure 1).

It is also important to note that lay theories outside of the domain of malleability can also relate to intergroup outcomes, for example essentialism (Bastian & Haslam, 2006; Haslam, Rothschild, & Ernst, 2000; Pauker, Ambady, & Apfelbaum, 2010), lay theories of race as biological or socially constructed (Keller, 2005; Sanchez, Young, & Pauker, 2015; Verkuyten, 2003; Williams & Eberhardt, 2008; Yzerbyt, Rocher, & Schadron, 1997), or diversity ideologies (Plaut, Thomas, & Goren, 2009; Rattan & Ambady, 2013; Richeson & Nussbaum, 2004; Rosenthal & Levy, 2012). It will be important for future research to further delineate the contributions of lay theories about malleability from other types of lay theories related to intergroup relations (Haslam, Bastian, Bain, & Kashima, 2006; Levy, Chiu, & Hong, 2006; Murphy, Richeson, & Molden, 2011).

A framework for understanding the influence of mindsets about malleability on intergroup relations.

We frame the extant research linking lay theories and intergroup relations in terms of (1) the expression of stereotyping and prejudice among perceivers and (2) responses to stereotyping and prejudice among targets. “Perceivers” refer to those who observe others across group boundaries and exhibit bias. “Targets” of prejudice describe those who are subject to intergroup biases. Of course, these terms are imperfect delineations of reality, given that all individuals play both roles across situations (Richeson & Shelton, 2007; Shelton & Richeson, 2006; Shelton, Richeson, & Vorauer, 2006). Therefore, we also discuss

the role of mindsets in entrenched intergroup conflicts (Bar-Tal & Halperin, 2011; Halperin et al., 2011), which involve the same people as both perceivers and targets simultaneously.

Theoretically, why would people's naïve assumptions about whether characteristics are fixed or malleable intersect with intergroup dynamics? Recall that lay beliefs about malleability are at the core of people's systems for understanding and interacting with the world (Dweck et al., 1995; Plaks, Levy, & Dweck, 2009). Believing that core attributes are fixed and unchanging orients people toward diagnosing others' traits, as these are seen as driving behavior, seeing evidence of those traits in behavior, and maintaining perceptions (Chiu et al., 1997; Erdley & Dweck, 1993). From a fixed mindset perspective, initial impressions and group memberships (as well as the attitudes and affect associated with these) offer meaningful information on outgroup members' characteristics and future behavior, and therefore ought to be relied upon to a greater degree. A fixed mindset also fosters the desire to perform highly in desired domains to confirm that one has ability, and the perception that effort is indicative of a lack of ability, engendering an avoidance of challenge (Dweck & Legett, 1988). Although people who believe that core attributes are malleable and can be developed have an equal desire to understand and predict the world they encounter, their founding assumption demands that to do so, they attend to situational contexts and people's internal states, rather than overly rely on group memberships (Chiu et al., 1997; Erdley & Dweck, 1993). Believing core attributes to be malleable also generates a desire to use effort to grow and develop and therefore more engagement with challenge and difficulty (Dweck & Legett, 1988).

In the intergroup context, then, fixed mindsets ought to foster greater reliance on group memberships as diagnostic of character, concern with performing effectively in interactions, and an avoidance of challenging situations, whereas growth mindsets ought to foster greater attention to individual (rather than group) characteristics, more concern with

learning in interactions, and continued engagement in the face of difficulty. In the sections that follow, we highlight how these two perceptual orientations influence both perceivers' expression of, and targets' responses to, stereotyping and prejudice.

Mindsets about malleability influence stereotype formation, endorsement, and maintenance.

People categorize others rapidly and automatically into in- versus out-group members (Ito, Thompson, & Cacioppo, 2004; Ito & Urland, 2003; Taylor, 1981), bringing associated content knowledge, known as stereotypes, online (Crisp & Hewstone, 2007; Freeman & Ambady, 2009, 2011; Macrae, Bodenhausen, & Milne, 1995). While research has linked mindsets to stereotype formation, endorsement, and expression, virtually no research to date has investigated the initial and basic step of group categorization (but see Eberhardt, Dasgupta, & Banaszynski, 2003, under Stereotype Maintenance below). While there is no reason to predict that lay theories about malleability should influence people's basic ability to sort individuals into groups, it is possible that fixed mindsets would facilitate faster categorization of in- versus out-group status than growth mindsets, and that this initial categorization spurs some of the downstream effects of mindsets on stereotype formation, endorsement and maintenance reviewed below. This significant gap in the literature will be a fascinating area for future work to investigate.

Stereotype Formation. To investigate the role of mindsets in stereotype formation, research has examined how readily people form stereotypes of novel groups. In one set of studies, 11-13 year-old children learned about a school where children performed bad acts, such as calling a peer's artwork ugly or failing to help a classmate (Levy & Dweck, 1999). In another set of studies, adult undergraduates read about student groups at an unknown university who exhibited negative (e.g., pushing to the front of a line) or positive behaviors (e.g., sharing an umbrella) (Levy, Stroessner, & Dweck, 1998). Researchers measured

participants' beliefs about whether personality (Levy & Dweck, 1999) or the kind of person someone is (Levy et al., 1998) can change or not, and found that both children and adults who held fixed mindsets were more likely than those with growth mindsets to form stereotypes of these novel groups. For example, children who endorsed the entity lay theory of personality labeled the novel school as "mean" on average and applied this descriptor to more kids in the school, whereas children who endorsed the incremental belief labeled the school as "a little mean" on average and applied the label less globally (Levy & Dweck, 1999). Similarly, adults used more trait descriptors and extreme adverbs (e.g., "very", "always") to describe the positive and negative groups when they held fixed rather than growth mindsets (Levy et al., 1998). Entity theorists also made their evaluations more quickly than incremental theorists, and reported greater satisfaction with the relatively minimal amount of information they had been offered (Levy et al., 1998). These patterns emerged both when participants' mindsets had been measured and experimentally manipulated. It is not just that those with fixed views are more pessimistic whereas those with growth views are more optimistic, because entity theorists were relatively more predisposed to stereotyped judgments for both the negative and positive student groups (Levy et al., 1998).

Stereotype Endorsement. Levy et al. (1998) assessed adults' kind-of-person mindsets and then asked them to list societal stereotypes about African Americans, Asians, Caucasians, Hispanics-Latinos, and Jews. People with more fixed and more malleable views did not significantly differ in the number and types of societal stereotypes listed (Levy et al., 1998). However, when these participants next indicated their agreement with the stereotypes they had listed, differences emerged. Participants who held fixed mindsets were more likely to endorse the stereotypes as true than those who held growth mindsets (Levy et al., 1998). The influence of mindsets on stereotype endorsement is causal: participants exposed to either a

fixed or growth mindset about personality showed comparable results. Levy et al. (1998) documented an effect of mindsets on stereotyping over and above well-known predictors, such as social desirability, right-wing authoritarianism, attributional complexity, need to evaluate others, and personal need for structure.

The research reviewed above focuses almost exclusively on explicit stereotyping, which raises the question of whether implicit stereotypes, or nonconscious cognitive associations (Greenwald, McGhee, & Schwartz, 1998; Nosek et al., 2007), are also shaped by mindsets about malleability. Because mindsets did not differentially predict people's stereotype content knowledge (Levy et al., 1998), it may be that these lay theories are unrelated to implicit bias. Alternatively, because mindsets direct attention to theory-relevant information, mindsets may shape the strength of implicit associations. We hope future research will offer insight into this gap in the literature.

Stereotype Maintenance. Stereotypes, once formed, are resistant to change (Bodenhausen, 1988; Devine & Elliot, 1995; Maass, Salvi, Arcuri, & Semin, 1989; Macrae, Hewstone, & Griffiths, 1993; Weber & Crocker, 1983). Yet, malleability beliefs can orient people toward individuating information, undercutting stereotypic perceptions. Plaks, Stroessner, Dweck, & Sherman (2001) gave people information about a negatively stereotyped actor (Nazi), a positively stereotyped actor (priest), or a neutral actor (novel social group). When people read that the kind of person someone is can change (incremental theory condition), they allocated relatively more attention and memory to additional stereotype-inconsistent information (i.e., information that individualized the target person, Plaks et al., 2001). In comparison, when people read that the kind of person someone is cannot change (entity theory condition), they allocated relatively more attention and memory to stereotype-consistent information (i.e., information that confirmed the group membership, Plaks et al., 2001).

Research has shown these perceptual orientations not just in terms of social information, but also for physical representations. Eberhardt et al. (2003) measured participants' kind-of-person theories and then showed them a picture of a racially ambiguous target person – a Black-White morph – labeled either “Black” or “White.” Later, participants had to identify who they had seen from two images, but in fact neither picture corresponded to the original face: one had been morphed with more of the original Black face, while the other had been morphed with more of the original White face, therefore showing more phenotypic stereotypicality of Blacks and Whites, respectively. In this context, entity theorists were more likely to choose the category-congruent face: when the initial label was “White,” they chose the phenotypically Whiter face, and when it was “Black,” they chose the phenotypically more Black face (Eberhardt et al., 2003). By contrast, incremental theorists chose the category-incongruent face, selecting the phenotypically Whiter face when the initial label read “Black,” and the phenotypically more Black face when it read “White” (Eberhardt et al., 2003). In another study, after an experimental manipulation of fixed and growth mindsets, participants drew from memory the Black-White morph. Judges, who never saw the original face or the racial label, classified drawings in the entity condition as more in line with the racial label that had been shown to participants, but they classified drawings in the incremental condition as more in line with the *opposite* racial label (Eberhardt et al., 2003). Mindsets thus shaped participants' representations of the racially ambiguous target person (even though they were equally accurate in recalling the label itself), either focusing them on the physical features indicative of the person's fit with their racial category membership or focusing on the physical features that individuated them, contrasting away from the person's racial category membership (Eberhardt et al., 2003).

In sum, fixed mindsets predispose people toward forming and relying on stereotypes, doing so more quickly, and preferentially attending to and remembering stereotype-consistent

information relative to growth mindsets. There is still much to investigate. Intergroup relations research increasingly investigates the social perception of multiracial individuals (Chen, Moons, Gaither, Hamilton, & Sherman, 2014; Gaither, Pauker, Slepian, & Sommers, 2016; Ho, Sidanius, Cuddy, & Banaji, 2013; Sanchez & Bonam, 2009). Given that fixed lay theories predispose people to view group boundaries as meaningful, might perceivers' mindsets differentially influence reactions to multiracial individuals, who by definition challenge social category boundaries? Relatedly, theoretical perspectives on intersectionality highlight that intergroup dynamics must always be considered in context with a person's diverse group memberships (Hall, Galinsky, & Phillips, 2015; Kulik, Robertson, & Perry, 2007; Purdie-Vaughns & Eibach, 2008; Rattan, Steele, & Ambady, 2016; Reid & Comas-Diaz, 1990; Sesko & Biernat, 2010; Shields, 2008). If fixed mindsets orient people toward group identities more than growth mindsets, could entity theorists afford greater consideration to others' double outgroup identities (Kang & Chasteen, 2009; Migdal, Hewstone, & Mullen, 1998; Remedios, Chasteen, Rule, & Plaks, 2011; Urban & Miller, 1998) than incremental theorists? Research has also begun to link stereotypes across identity dimensions (e.g., race-gender or race-age stereotypes, Galinsky, Hall, & Cuddy, 2013; Goff, Jackson, Di Leone, Culotta, & DiTomasso, 2014; Goff, Thomas, & Jackson, 2008; Hall et al., 2015; Johnson, Freeman, & Pauker, 2012; McMahon & Kahn, 2016; Rattan, Levine, Dweck, & Eberhardt, 2012; Schug, Alt, & Klauer, 2015; Todd, Thiem, & Neel, 2016) and testing whether these links are facilitated, impeded, or unrelated to people's mindsets may be a fruitful direction for further work. Future research on each of these topics will offer greater insight into these new directions of intergroup relations research, and they will also advance the study of mindsets by either replicating, complicating, or offering boundary conditions to our current understanding of lay theories' impact on intergroup dynamics.

Mindsets about malleability may influence the expression of prejudice.

More research must be done to directly investigate the relationship between mindsets about malleability and measures of intergroup prejudice (Brewer, 1999; de Dreu, 2010; Halevy, Bornstein, & Sagiv, 2008; Halevy, Weisel, & Bornstein, 2011). Acknowledging this gap, and therefore cautioning against strong conclusions regarding mindsets and prejudice, we point to certain behavioral indicators of prejudice, including lack of affective warmth (Krysan, 2000; McConahay, 1986), avoidance of outgroups (Bogardus, 1947; Norton, Sommers, Apfelbaum, Pura, & Ariely, 2006; Trawalter, Richeson, & Shelton, 2009), awkwardness in interactions (Carr et al., 2012; Dovidio, Kawakami, & Gaertner, 2002; MacInnis & Page-Gould, 2015; Shelton, Dovidio, Hebl, & Richeson, 2009; Vorauer & Kumhyr, 2001), and insensitivity toward the suffering of disadvantaged groups (Čehajić, Brown, & González, 2009; Harris & Fiske, 2006) that research has touched upon to date.

Levy et al. (1998) studied the formation of stereotypes about novel groups. They also measured affective negativity towards these groups on a scale from “very negative” (-100) to “very positive” (100; Levy et al., 1998), a measure reminiscent of classic thermometer measures of prejudice (McConahay, 1986). Fixed mindset participants exhibited significantly more prejudice toward the badly behaving group than growth mindset participants. Similarly, Levy & Dweck's (1999) study of stereotype formation included a measure of social distancing. Children generally did not want to interact with the novel group that behaved poorly, but entity theorists were more likely to socially distance (e.g., not attend a party, avoid friendships with the outgroup) compared to incremental theorists (Levy & Dweck, 1999).

Research has extensively documented that outgroup prejudice impairs helping (Cuddy, Rock, & Norton, 2007; Hornstein, 1978; Levine, Prosser, Evans, & Reicher, 2005). Karafantis & Levy (2004) found correlational evidence that a growth kind of person mindset may relate to lower intergroup prejudice in this respect. 9-12-year-old children who endorsed

fixed (vs. growth) mindsets reported more negative attitudes, were less open to social interactions, and reported less past volunteering on behalf of low-income stigmatized children (Karafantis & Levy, 2004). After volunteering for the Trick-or-Treat for UNICEF Program raising funds for low-income stigmatized children, growth mindset children reported being more active volunteers, enjoying the experience more, and a greater willingness to volunteer again relative to fixed mindsets children (Karafantis & Levy, 2004).

Some research has more directly investigated the relationship between mindsets and people's readiness to act on their stereotypes in a discriminatory way. Prevalent stereotypes link men and leadership, or distance women from leadership (Rudman & Kilianski, 2000; Simon & Hoyt, 2008). Hoyt & Burnette (2013) found correlational evidence that gendered ideals about leadership as stereotypically male were less likely to yield discriminatory evaluations of female leaders' abilities when undergraduates held incremental rather than entity theories about the kind of person someone is. That is, a well-documented effect of gender prejudice emerged more among those who held fixed, rather than growth, beliefs about others' ability to change (Hoyt & Burnette, 2013).

The research reviewed above suggests that mindsets may play a role in the lack of affective warmth, avoidance of outgroups, and discriminatory treatment considered indicative of prejudice. However, a compelling body of work shows that a desire to perform well in intergroup situations can ironically engender similar outcomes, depending upon a person's mindset about the malleability of prejudice itself. Intergroup situations can be conceptualized as performance contexts, and as noted earlier, fixed versus growth lay theories afford different goals and outlooks in such contexts (performance versus learning; Dweck & Leggett, 1998). In both correlational and experimental studies, majority group members who held fixed mindsets about the nature of prejudice requested less information about racial bias, wanted to and did exit intergroup interactions more, and engaged with learning opportunities

around issues of race and racism less than majority group members who held growth mindsets about prejudice (Carr et al., 2012; Neel & Shapiro, 2012). This withdrawal from intergroup contexts as a function of mindsets about prejudice extended to patterns of social distancing; when preparing for an intergroup interaction, fixed mindset participants set chairs almost 10 inches further away from each other, compared to growth mindset participants (Carr et al., 2012). When participants were tasked with actually interacting with an outgroup member or discussing issues of race and diversity, fixed mindset perceivers exhibited more anxious, negative, and disengaged nonverbal behaviors (Carr et al., 2012; Neel & Shapiro, 2012). These differences emerged even after controlling for participants' actual racial bias (Carr et al., 2012; Neel & Shapiro, 2012), suggesting that a fixed mindset about prejudice can paradoxically engender one of the classic behavioral markers of prejudice in intergroup interactions. In line with these findings, research has found that, for both minority and majority group members, taking an intergroup learning (vs. performance) orientation leads to greater levels of comfort and interest in engaging in interactions with outgroup members (Migacheva & Tropp, 2012; Murphy et al., 2011).

This research reveals two routes to behaviors typically characterized as biased. On the one hand, some evidence suggests that those who view people's personality (or the kind of person someone is) as fixed tend to exhibit behaviors traditional considered markers of prejudice. On the other hand, regardless of their level of prejudice, those who view *prejudice* as fixed come to exhibit similarly disengaged and distancing behaviors. Foremost, more research is necessary to understand these nuances in the expression of prejudiced behavior. At the same time, perhaps findings such as encourage us to reconsider the definition of prejudice, or at least its commonly agreed-upon behavioral indicators. Addressing these questions would ensure that operationalizations of prejudice appropriately reflect the complex and dynamic reality of bias in the modern age.

Mindsets about malleability and targets' responses to being stereotyped.

Much research has documented the negative consequences of social identity threat, the concern about confirming negative stereotypes about one's group in diagnostic contexts in which group memberships are salient (Spencer, Logel, & Davies, 2016; Steele & Aronson, 1995). Targets of prejudice under stereotype threat exhibit increased anxiety, learn less, perform worse, feel less like they belong, and show greater attrition (Good, Rattan, & Dweck, 2012; Jamieson & Harkins, 2007; Schmader & Johns, 2003; Schmader, Johns, & Forbes, 2008; Steele & Aronson, 1995; Taylor & Walton, 2011). Social identity threats arise in diagnostic situations, and as noted above, fixed mindsets treat performance situations as diagnostic of ability, whereas growth mindsets treat these same situations as opportunities for challenge and learning (Aronson, Fried, & Good, 2002; Dweck, 1999; Dweck & Leggett, 1988). Given this, might a growth mindset buffer members of stigmatized groups from the negative performance and belonging consequences of social identity threats? Aronson et al. (2002) conducted a field experiment in which students received training on the growth mindset about intelligence: they watched an instructional video offering evidence that intelligence can grow, wrote a letter sharing these ideas with a middle school student, and finally transformed their letter into a audiotaped speech. Nine weeks later, African American students in the growth mindset condition showed significant increases in their reported enjoyment of academics, identification with academic achievement, and actual academic performance (controlling for SAT scores), compared to those in the two control conditions, who had either received training about the "multifaceted" nature of intelligence or no training at all (Aronson et al., 2002). Another field experiment that implemented a growth mindset intervention found a positive effect of growth mindsets about intelligence on Latino/Hispanic seventh-grade girls' performance on the math portion of their end-of-year state standardized test (Good, Aronson, & Inzlicht, 2003). Relatedly, Dar-Nimrod & Heine (2006) found that

characterizing math ability as genetic (a view congruent with fixed mindsets) led women to underperform on a math test relative to when math ability had been characterized as environmentally determined (a more growth-congruent view). Conversely, performance benefits ensue when fixed views bolster *positive* stereotypes about one's group, for example Asians and men in math (Mendoza-Denton, Kahn, & Chan, 2008).

Studying the impact of mindsets on targets of bias has led to the novel insight that, separate from one's own lay theories, mindsets communicated by others in the environment, the field, or the workplace setting can play a meaningful role in outcomes (Good et al., 2012; also see Murphy & Dweck, 2010). Good et al. (2012) found that undergraduate women who simultaneously perceived high stereotyping and a fixed mindset about intelligence in their math classrooms exhibited decrements to their sense of belonging, whereas those who perceived similarly high gender stereotyping but instead a growth mindset about intelligence maintained their sense of belonging to math. In turn, women's higher sense of belonging to math was associated with a greater desire to pursue math in the future and higher end-of-term math grades, showcasing broader consequences for performance and retention (Good et al., 2012). Mindsets can thus buffer targets against the psychological impact of negative stereotypes about the ingroup. In organizational settings, Emerson & Murphy (2015) found that STEM workplaces that espoused fixed (rather than growth) mindsets about ability were less trusted by women because women felt greater concern about being stereotyped. The consequences may be particularly damaging in the context of difficulty; women who anticipated performing poorly in an interview were more likely to disengage if the company had endorsed a fixed (vs. growth) mindset. Relatedly, Leslie, Cimpian, Meyer, & Freeland (2015) showed that the more faculty view performance in their field as stemming from innate genius (a fixed-mindset view), the less likely it is for women to receive Ph.D.s in the field.

This body of research suggests that encouraging growth mindsets about ability among individuals, fields of study, and organizations could offer a fruitful means for intervening across levels to support the talent and potential of targets of prejudice (see Rattan, Savani, Chugh, & Dweck, 2015). At the same time, members of stigmatized groups exhibit a wide array of negative psychological and physical health outcomes as a result of bias (Feagin & Sikes, 1994; Harrell, Hall, & Taliaferro, 2003; Richeson & Shelton, 2007; Sawyer, Major, Casad, Townsend, & Mendes, 2012; Williams, Neighbors, & Jackson, 2003; Williams & Williams-Morris, 2000), and future research should investigate whether and how mindsets about malleability play a role in these outcomes. To the degree that extant research suggests growth mindsets buffer the negative consequences of social identity threat, it is possible that they may compose part of a psychological self-defense system that protects against a myriad of negative outcomes associated with experiencing bias.

Mindsets about malleability and targets' responses to overt expressions of prejudice.

Turning from the influence of subtle stereotyping to the persistence of overt expressions of bias in everyday social interactions (Ely, Meyerson, & Davidson, 2006; Sue, 2010), we see that mindsets about malleability play a role in who confronts bias. Of course, no one should ever be expected to address bias, but research suggests targets want to do so, yet often feel held back from speaking out (Shelton, Richeson, Salvatore, & Hill, 2006; Swim & Hyers, 1999; Woodzicka & LaFrance, 2001). Rattan & Dweck (2010) theorized that a growth mindset might offer targets of prejudice the underlying motivation to address bias, with the goal of catalyzing change in the perpetrator of bias. Conversely, because a fixed view of others means that someone who is biased will remain biased, this perspective might undercut targets' motivation to confront. Indeed, when racial minority undergraduates experienced a biased statement from a majority group member, those who held an

incremental theory of others' personality (either measured or manipulated) were more likely to speak out to express their disagreement with the biased statement than those who held fixed views, although everyone was equally offended by the statement.

In studies of minorities' and women's expectations following an experience with prejudice, Rattan & Dweck (2016) found that a growth mindset *only* engendered benefits for minorities' and women's outlook on future relations, sense of belonging, and workplace satisfaction, when they had also reported confronting prejudice. Absent this positive change-oriented action, minorities and women who held growth mindsets showed as negative outlooks and feelings as did fixed mindset participants (regardless of whether they had spoken out or not). These findings raise exciting new questions about the broader situational and behavioral factors that may be necessary for growth mindsets to yield benefits, and highlights the possibility that there may be limits to the benefits of growth mindsets, topics that deserve significantly greater attention.

Mindsets about malleability across the perceiver-target divide: resolving entrenched conflicts.

Mindsets also play a role in the context of real-world protracted conflicts, or conflicts with a history of failed peace-making attempts (Bar-Tal, 2001; Coleman, 2003). In this context, maintaining a sense of hope for reconciliation can be essential. Cohen-Chen, Halperin, Crisp, & Gross (2014) found that Jewish Israelis who believed (or were led to believe) that the nature of conflicts is malleable, rather than fixed, reported significantly greater hope about the Israeli-Palestinian conflict. Greater hope, in turn, led growth mindset participants to report significantly greater willingness to compromise on core issues of the conflict, compared to fixed mindset participants. Relatedly, Saguy and Halperin (2014) showed that after seeing an outgroup member exhibit criticism toward his own group, only

those who held growth mindsets about groups felt more hopeful, whereas fixed mindset participants were unaffected.

In addition to promoting positive group-based emotions, growth mindsets can also mitigate negative ones. Turkish Cypriot participants led to hold an incremental (vs. entity) theory about their opponents' behaviors in violent conflicts reported significantly lower anxiety at the thought of encountering a Greek Cypriot (Halperin et al., 2012). As a result, they were more likely than those with a fixed mindset to pick a Greek rather than Turkish Cypriot partner to discuss solutions to the conflict (Halperin et al., 2012).

Setting the stage for compromise in such conflicts is key. Wohl et al. (2015) showed that individuals who hold a growth mindset about the malleability of groups are more open to accepting remorse from the other side, and thus report significantly greater willingness to accept a collective apology, reciprocate, and initiate a peace process compared to fixed mindset participants. Levontin, Halperin, & Dweck (2013) linked mindsets about the malleability of personality and people's propensity to hold on to dispositional attributions for the outgroup's behaviors. Jewish Israeli participants exposed to an entity theory and led to make dispositional attributions for Israeli Arabs' behavior exhibited significantly lower willingness to compromise in the conflict, lower support of civil rights, and higher levels of negative stereotyping towards Israeli Arabs than those led to make situational attributions; participants in the incremental condition did not show these differential effects of attribution-type, suggesting that a growth mindset can mitigate the negative effects of dispositional attributions in longstanding conflicts.

In sum, viewing personality, groups, conflicts, or the world as malleable rather than fixed may promote paths toward progress and peace in intractable conflicts. Future research should test the viability of growth mindset interventions over the longer-term, to test whether they maintain their effectiveness even in the face of setbacks to the peace process.

Conclusion: Mindsets about malleability matter for intergroup relations.

We have reviewed the growing body of research linking mindsets about malleability to perceivers' expressions of, and targets' responses to, stereotyping and prejudice. From this review, it is evident that the study of intergroup relations would be incomplete without a consideration of people's lay beliefs about malleability. The reverse is also true: those who study lay theories must consider the unique insights that will be offered through further study of intergroup relations. For example, considering the many links between mindsets and intergroup dynamics, research would do well to consider the possibility that early, formative intergroup interactions may be one source of people's fixed versus growth mindsets. Considering the many domains of mindsets that have been shown to influence intergroup dynamics, we suggest that future research should also focus on the development of a theoretical framework for organizing which domains of malleability beliefs matter most for our behavior and reactions in intergroup situations, and why. In doing so, the study of intergroup relations will advance our basic understanding of lay theories, in terms of the relative importance of different domains in mindsets for intergroup outcomes, and boundary conditions of different domain-specific beliefs.

We have highlighted many areas for further research into these topics, which we hope will offer meaningful theoretical advances both in the domain of intergroup relations and in our understanding of people's lay theories. If the goal is to better understand and ultimately intervene to improve intergroup relations in society, the study of mindsets will undoubtedly be an essential component.

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Figure 1: Mindsets about malleability drive the building blocks of intergroup dynamics.

	Mindsets and the Expression of Stereotypes and Prejudice among Perceivers				Mindsets and Responses to Stereotypes and Prejudice among Targets		Mindsets across the Perceiver-Target Divide in Entrenched Conflicts	
	Knowledge	Explicit stereotypes			Prejudice expression	Implicit stereotypes		Overt prejudice
		Formation	Endorsement	Maintenance				
Fixed mindsets are associated with...		Greater propensity to form more extreme stereotypes more quickly, and to exhibit greater satisfaction when minimal information is available	Greater tendency to endorse group stereotypes as true	Greater attention allocated to stereotypical information or characteristics that confirm a person's group membership	Greater propensity to express behavioral signs of prejudice (negative attitudes, social distancing, awkwardness) in intergroup interactions	Lower performance, sense of belonging, identification, and engagement in domains in which negative stereotypes exist	Lower likelihood of confronting overt prejudice	Lower hope, greater anxiety about intergroup contact, less willingness to compromise and initiate a peace process
Growth mindsets are associated with...	No differences in stereotype content knowledge	Lower propensity and readiness to form extreme stereotypes, less satisfaction with minimal information about groups	Lower tendency to endorse group stereotypes as true	Greater attention allocated to individualizing information	Lower propensity to express behavioral signs of prejudice (negative attitudes, social distancing, awkwardness) in intergroup interactions	Buffered performance, sense of belonging, identification, and engagement in domains in which negative stereotypes exist.	Greater likelihood to confront overt prejudice	Greater hope, lower anxiety about intergroup contact, greater propensity to to compromise and initiate a peace process
Domain of mindset	<ul style="list-style-type: none"> • "Kind of person" (Levy et al., 1998) 	<ul style="list-style-type: none"> • Personality (Levy & Dweck, 1999) 	<ul style="list-style-type: none"> • Personality (Chiu et al., 1997) • "Kind of 	<ul style="list-style-type: none"> • "Kind of person" (Eberhardt et al., 	<ul style="list-style-type: none"> • "Kind of person" (Hoyt & Burnette, 	<ul style="list-style-type: none"> • Intelligence (Aronson et al., 2002; Emerson & 	<ul style="list-style-type: none"> • Personality (Rattan & 	<ul style="list-style-type: none"> • Groups (Halperin et al., 2012; Saguy & Halperin, 2014; Wohl et al., 2015)

		<ul style="list-style-type: none"> • “Kind of person” (Levy et al., 1998) 	<p>person” (Levy et al., 1998)</p>	<p>2003; Plaks et al., 2001)</p>	<p>2013; Karafantis & Levy, 2004; Levy et al., 1998)</p> <ul style="list-style-type: none"> • Personality (Levy & Dweck, 1999) • Prejudice (Carr et al., 2012; Neel & Shapiro, 2012) 	<p>Murphy, 2015; Good et al., 2003; Murphy & Dweck, 2010)</p> <ul style="list-style-type: none"> • Math intelligence (Dar-Nimrod & Heine, 2006; Good et al., 2012; Mendoza-Denton et al., 2008) • Field-specific ability (Leslie et al., 2015) 	<p>Dweck, 2010)</p>	<ul style="list-style-type: none"> • Nature of conflicts (Cohen-Chen et al., 2014) • Personality (Levontin et al., 2013)
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