

A Diversity Science Approach to Climate Change

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Chapter in preparation for S. Clayton and C. Manning (Eds.) *Psychology and Climate Change*.

Author Note: Preparation of this chapter was supported by a David L. Hirsch III and Susan H. Hirsch Research Initiation Grant awarded to the first author.

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### **Abstract**

This chapter reviews psychological research on diversity and its implications for understanding public engagement with climate change. Meaningful and timely action on climate change will require engaging a diverse set of stakeholders, both within and between nations, in order to develop and implement more effective mitigation and adaptation policies; as such, there is an urgent need to better understand factors that drive differential engagement within increasingly diverse, pluralistic societies. In this chapter, we draw on current psychological perspectives on social identity, identity-based motivation, and belonging to explore how race, ethnicity, and class shape public engagement with the issue, and key social psychological processes that may contribute to persistent and substantial disparities in the environmental sector. We highlight empirical findings that illustrate the value of this approach, identify major gaps in current understanding, and discuss new avenues for future research on group-level conduits and barriers to climate change engagement.

*Keywords:* Diversity, Race/ethnicity, Social Identity, Intragroup Processes, Stereotyping, Intergroup Relations

### A Diversity Science Approach to Climate Change

*For Latinos, our strong positions on questions pertaining to the importance of stewardship of our natural environment and conservation of resources reflect long-held cultural tenets taught to us not as environmentalism, but based more on common sense, economic necessity, and good citizenry.* - Mark Magaña, President/Founder GreenLatinos

When Hurricane Katrina struck New Orleans in late August of 2005, virtually all inhabitants of the city were affected and displaced, but impacts fell disproportionately on racial and ethnic minority and low-income communities. Disparities were evident in a comparison of undamaged versus damaged areas, which had a higher proportion of Black and low-income residents (Masozera, Bailey, & Kerchner, 2007), in the slower rates of return to the city by Blacks compared to Whites (Fussell, Sastry, & VanLandingham, 2010), and in higher mortality rates (estimated at 1.7 to 4 times greater) among Black residents, relative to Whites (Brunkard, Namulanda, & Ratard, 2008). Events such as these highlight the significant social dimensions of natural disasters, such as hurricanes, that are projected to occur with greater frequency and intensity with climate change (Bolin, 2006; Knutson et al., 2010; Laska & Morrow, 2006). Yet, despite growing attention to inequity in climate-related impacts, and to racial and ethnic disparities within psychology generally, scholars have only recently begun to apply behavioral science approaches to understand how diversity and inequity shape climate change attitudes, beliefs, and behavior in pluralistic societies.

This chapter reviews the insights and applications of diversity science to the psychological study of climate change. Although many identity dimensions are relevant to the study of diversity (e.g., age, religion, cultural diversity), in this chapter, we focus on racial,

ethnic, and class differences in climate change engagement, consistent with the growing empirical literatures on these dimensions in public opinion research on climate change (see Pearson, Ballew, Naiman, & Schuldt, 2017). We begin by considering why diversity matters for understanding public engagement with climate change and describe what a diversity science approach can contribute to current social science perspectives in this area. We then review empirical evidence for racial, ethnic, and class differences in climate change attitudes, beliefs, and behavior that highlight the differing ways that groups may engage with the issue. Next, we discuss social psychological processes that may either enhance or undermine engagement among groups that remain substantially underrepresented within the environmental movement. We conclude by considering the implications of a diversity science approach for developing effective organizational practices and policies that seek to broaden public participation in environmental decision making.

### **Why Diversity Matters for Climate Change**

Due to increased trans-national migration and demographic shifts within countries, many industrialized nations that contribute disproportionately to climate change and have the greatest influence on international policy-making, such as the United States and nations in Western Europe, are also becoming more diverse. Within the U.S., racial and ethnic minorities accounted for over 92% of the nation's population growth in the decade from 2000 to 2010, with current estimates indicating that a majority of the under-18 U.S. population will identify as a member of a racial or ethnic minority by 2020 (Colby & Ortman, 2015; Heimlich, 2011). Beyond the U.S., similar demographic changes are projected for Europe and Australasia with the arrival of humanitarian entrants and skilled migrants, with migration set to increase as a result of climate change and its impacts in the coming decades (Piguet, Pécoud, & de Guchteneire, 2011; United

Nations, 2016). These shifting demographics underscore a need for research that can inform government and organizational efforts to broaden public participation in climate discourse and decision-making in increasingly diverse societies, and particularly among groups disproportionately affected by climate change.

Although climate change is a global threat, its impacts are not evenly distributed, but instead fall disproportionately on the world's poor and politically disenfranchised (e.g., Miranda, Hastings, Aldy, & Schlesinger, 2011; Wilson, Richard, Joseph, & Williams, 2010). Racial and ethnic minorities, women, and members of other socioeconomically disadvantaged groups experience harmful impacts of climate change at substantially greater levels than those of more advantaged groups, such as Whites and the more affluent (Cutter, Emrich, Webb, & Morath, 2009; United Nations Development Programme, 2007). To make matters worse, global inequality is expected to increase substantially within the next several decades as wealthier nations at higher latitudes, such as Canada and Scandinavia, stand to benefit economically from regional warming, whereas poorer nations closer to the equator will be negatively affected. The effects of climate change on global inequality may further exacerbate and compound climate disparities as poorer countries struggle to adapt to its effects (Burke, Hsiang, & Miguel, 2015).

Beyond fundamental issues of equity, there are other important reasons for studying factors that broaden and sustain public engagement on climate change. In particular, the well-documented political divide on climate change within the U.S. and some European nations (see Dunlap, McCright, & Yarosh, 2016) and wavering public interest in climate change globally (Brulle, Carmichael, & Jenkins, 2012) present formidable challenges for organizations and policy-makers who are looking to build consensus and galvanize public support for adaptation and mitigation policies. Moreover, research on group decision making suggests that diversity in

teams promotes more effective problem-solving and the development of more innovative solutions (e.g., Hong & Page, 2004; Levine et al., 2014)—precisely the kind of solutions needed to avert the worst effects of climate change. Understanding factors that enhance diversity in climate decision-making may, thus, not only address inequity by giving voice to groups disproportionately affected by climate change, but also spur the development of new solutions that are urgently needed to help communities and nations fight and adapt to a changing climate.

#### *A Diversity Science Approach*

Insights from diversity science can help guide psychological inquiry on factors that shape public engagement on climate change. Diversity science represents an interdisciplinary approach that uses behavioral science methodologies to consider how people create, interpret, and maintain group differences, as well as the psychological and societal consequences of these distinctions (Plaut, 2010). Thus, a diversity science approach can help to illuminate key *socio-motivational* underpinnings of environmental engagement (i.e., social psychological mechanisms) and the ways in which both intra- and inter-group processes can powerfully shape these motivations.

Diversity science, as an interdisciplinary approach, emerged from the fields of social psychology and organizational behavior to understand psychological processes underpinning racial and ethnic disparities within organizations and academia; the approach has been applied to a wide range of fields, including healthcare, employment, education, criminal justice, and organizational behavior (for reviews, see Apfelbaum, Norton, & Sommers, 2012; Cheryan, Ziegler, Montoya, & Jiang, 2017; Dovidio, Gaertner, Ufkes, Saguy, & Pearson, 2016; Cohen, Garcia, & Goyer, 2017; Oyserman & Lewis, 2017; Plaut, 2010; Yeager & Walton, 2011). Importantly, within each of these domains, a diversity science approach considers how the

perspectives of both majority and minority group members can contribute to intergroup disparities. In the following sections, we extend a diversity science framework to the domain of climate change communication and organizational practice to explore three core questions: What motivates people to join environmental professions, organizations, and initiatives? How do different ways of framing sustainability challenges influence *who* engages with climate change advocacy? And how do both majority and minority group perspectives shape environmental attitudes and collective action in increasingly diverse societies, such as the U.S.?

In their review of public opinion work on climate change, Wolf and Moser (2011) distinguish between climate change *understandings* (acquisition and use of knowledge about climate change), *perceptions* (e.g., subjective experience as well as interpretations of others' beliefs and actions), and *engagement* (a motivational state that can include cognitive, emotional, and/or behavioral dimensions) as distinct but complementary ways that individuals respond to climate change. In the following sections, we summarize research and theory that examines how social groups shape each of these dimensions, with a particular focus on psychological processes that may influence engagement at the collective level (e.g., activism and participation in environmental organizations). We begin by reviewing empirical research highlighting the key role of identity processes in climate change engagement and then turn to theoretical perspectives within social psychology that offer additional insights into the ways that group memberships can impact engagement, particularly for members of traditionally underrepresented groups.

### *Identity-Based Approaches to Climate Change Engagement*

A growing body of research on environmental behavior suggests that social identities can affect both how people perceive environmental risks and how they engage with groups working to address them (Feygina, 2010; Fielding et al., 2014; Pearson et al., 2016; Swim & Becker,

2012). Moreover, interventions that capitalize on social identity processes have been shown to be particularly effective at motivating cooperation in resource dilemmas (see Brewer & Silver, 2000; Ostrom, 1990; Van Vugt, 2009), and engagement with activist causes, generally (see Tyler & Blader, 2000).

According to the social identity model of collective action (van Zomeren, Postmes, & Spears, 2008; see also van Zomeren, Spears, & Leach, 2010), people take action when they identify with groups attempting to mobilize action, believe that their group's actions can be effective, and experience strong emotional reactions (e.g., feelings of injustice). For instance, a series of studies examining what motivates people to join local climate change initiatives found that the extent to which people identified with the group involved in the cause was a strong predictor of motivation to participate, over and above concerns about costs and benefits of participating (Bamberg, Rees, & Seebauer, 2015; see also Bamberg, Rees, & Schulte's chapter in this volume). In addition, whereas those who more strongly identified with the group showed intrinsic motivations to participate (e.g., viewing the group's goals as more important than one's personal reasons for participating), those with low levels of identification were more extrinsically motivated, focusing on personal costs and benefits of participating.

The group engagement model (Tyler & Blader, 2003), similarly posits that identity motivations are central to psychological and behavioral engagement with groups, and that perceptions of procedural justice (e.g., inclusion in decision making processes, being recognized and treated with respect) are a primary mechanism through which people assess, establish, and maintain group ties. Process fairness provides people with reassurance that a group values and represents their interests, which in turn fosters a sense of connection and identification with the group, its members, and their goals. Including members of traditionally underrepresented groups

as meaningful stakeholders in climate change decision making is, thus, important not only for ensuring greater equity in decision making (e.g., addressing problems that matter to these groups), but also for broadening public support and solidarity with groups working to address climate change.

The unique complexity (e.g., implicating both biophysical and social systems), temporal features, and geographic scale of climate change that make it difficult to understand and predict can also directly impact social identity processes. Uncertainty about the causes and long-term effects of climate change is often viewed as a chief barrier to public mobilization (Barrett & Dannenberg, 2014; Budescu, Broomell, & Por, 2009; Pidgeon & Fischhoff, 2011). However, uncertainty can also *increase* collective action by enhancing identification with groups engaged in activist causes. Generally, people participate in social movements not only to effect social change but also to establish social identities and strengthen social ties with fellow group members (Hogg, 2007; Klandermans, 2004). High and enduring uncertainty due to economic collapse or natural disasters can lead people to seek and affiliate with groups that are ideologically more extreme, or make existing groups more extreme, to reduce the uncertainty (see Hogg, 2007). Thus, uncertainty surrounding climate change may heighten the importance of social identities and impact the strength of group ties in ways that may hinder or enhance collective efforts to address the problem.

Research on partisan influences provides additional evidence of the role of group identities (e.g., party affiliations) in shaping public opinion on climate change. People's beliefs and experiences, including their perceptions of other group members' beliefs, form an important basis for how they perceive social and political issues (Wood & Vedlitz, 2007). Individuals tend to adopt beliefs that are shared by members of salient ingroups and may resist revision of these

beliefs when they are confronted with conflicting information (Kahan, Braman, Gastil, Slovic, & Mertz, 2007; McCright & Dunlap, 2011a; Schuldt & Roh, 2014). Similarly, the elite cues hypothesis (Krosnick, Holbrook, & Visser, 2000) suggests that people are especially likely to rely on information from high-status ingroup members (e.g., political leaders) when an issue is perceived to be complex or controversial. Consistent with these perspectives, several studies have shown that as education and science literacy increase within the U.S. public, political polarization on climate change becomes *stronger*, suggesting that people process climate-related information in ways that reinforce their prior political stance (e.g., Hamilton, 2011).

### **Identity Influences Beyond Partisan Politics**

Compared to partisan influences, considerably less attention has been paid to the role of non-partisan social identities and group memberships, such as those related to race, ethnicity, and social class, that have also been shown to influence how people assess environmental risks (for reviews, see Ferguson, McDonald, & Branscombe, 2016; Pearson & Schuldt, 2015; Pearson et al., 2016; Schuldt & Pearson, 2016). Early studies often conflated environmental attitudes with specific behaviors, such as outdoor recreation (e.g., visits to national parks), membership in environmental organizations, and charitable donations. This measurement problem contributed to the belief that non-Whites were less concerned about the environment than Whites (for a historical review and critiques of this perspective, see Mohai, 2008; Macias, 2016b; and Taylor, 1989). Spurred largely by work in the environmental justice field over the past two decades, there has been a notable shift away from assessing environmental concern based primarily on attitudes toward *conservation* (e.g., protection of natural resources) to incorporating measures of environmental *risk*, and particularly perceived exposure to environmental hazards, such as health risks associated with industrial pollution that disproportionately affect Black and Latino

communities (see Arp & Kenny, 1996; Bullard, Johnson, & Torres, 2011; Jones & Rainey, 2006; Macias, 2016a; Mohai, 2008; Mohai & Bryant, 1998).

*Evidence for the Roles of Racial and Ethnic Identities*

U.S. opinion polls reveal a racial/ethnic gap in environmental concern—including about climate change, specifically—with non-White minorities expressing a level of concern that often exceeds that expressed by Whites (e.g., Dietz, Dan, & Shwom, 2007; Guber, 2013; Leiserowitz & Akerlof, 2010; Macias, 2016a; McCright & Dunlap, 2011a; Speiser & Krygsman, 2014; Whittaker, Segura, & Bowler, 2005; Williams & Florez, 2002). For instance, an analysis of U.S. Gallup Polls between 2001 and 2010 revealed that relative to Whites, non-Whites reported greater concern that climate change would pose a serious threat within their lifetime (McCright & Dunlap, 2011a), and this racial/ethnic gap in concern remained when controlling for other variables found to correlate with climate change beliefs, including income, education, religiosity, and political orientation (see Guber, 2013). Similarly, using data from the 2010 General Social Survey (GSS), Macias (2016a) found that non-Whites expressed greater concern for climate change than Whites, controlling for effects of age, gender, household income, education, rural/urban location, and political ideology. Moreover, non-Whites' concerns about climate change exceeded concern for more localized issues, such as air pollution from cars and industry.<sup>1</sup>

Research on ethnicity and acculturation processes also suggests a unique role of ethnic identities in climate change engagement. For instance, within the U.S., Asians and Latinos, the fastest-growing minority groups, consistently show the highest levels of concern about climate change among all racial and ethnic groups, and particularly among first-generation immigrants (e.g., Jones et al., 2014; Leiserowitz & Akerlof, 2010; Macias, 2016a, 2016b). Social

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<sup>1</sup> For evidence of a similar gap in climate change beliefs, risk perceptions, and policy support with regard to gender, see Pearson et al. (2017).

psychological research has identified distinct value orientations among these groups, such as a more interdependent, collectivistic orientation that prioritizes social harmony, respect, and concern for family and community over individuality and self-interest (Holloway, Waldrip, & Ickes, 2009) – values that are also associated with pro-environmental attitudes and behaviors (see Milfont, 2012). For instance, Schultz (2002) found that people from collectivist cultures generally have greater biospheric concerns than those from individualist cultures. These findings highlight the need for additional research that investigates key cultural factors that impact environmental attitudes and beliefs.

These gaps in concern translate to differences in policy support at both local and national levels. For instance, Blacks and Latinos typically express higher levels of support for national climate and energy policies than Whites, even when these policies incur a short-term cost (e.g., taxes). This includes proportionally higher support for regulating carbon emissions, improving fuel economy and household energy efficiency standards, and increasing taxes to mitigate climate change (see Figure 1; Leiserowitz & Akerlof, 2010; see also Dietz et al., 2007; Leiserowitz, 2006; and Krygsman, Speiser, & Lake, 2016). A similar pattern is evident even among policymakers, with research suggesting that Hispanic and African American members of Congress are more likely than White members to vote pro-environmentally (Ard & Mohai, 2011).

Some scholars have argued that environmental beliefs, including skepticism about climate change, can serve an “identity-protective” function to buffer the status afforded by advantaged group memberships (Kahan et al., 2007). Individuals from higher status groups (e.g., White males) are especially likely to resist regulatory policies aimed at reducing environmental risks and perceive them as challenges to established social, economic, and political institutions

(Feygina et al., 2010; McCright & Dunlap, 2011b). Policies aimed at mitigating climate change can represent a challenge to the status quo, which, in turn, may prompt responses to defend and legitimize those advantageous systems (e.g., denying climate change or its human causes; see Hennes, Ruisch, Feygina, Monteiro, & Jost, 2016).

Related work on the “White male effect” in environmental risk perception has highlighted the ways that gender, race, and political orientation can intersect to predict beliefs about climate change and support for mitigation policy. For instance, conservative White males are significantly more likely than other groups in the U.S. to deny the existence of climate change (Kahan, Jenkins-Smith, & Braman, 2011; Finucane, Slovic, Mertz, Flynn, & Satterfield, 2000; McCright & Dunlap, 2013). Complementing these findings, individuals from higher-status groups who are also more likely to perceive prevailing group hierarchies as just and fair (e.g., conservative White males) are most likely to resist policies aimed at regulating environmental risks and to perceive them as threatening established social, economic, and political systems (Feygina, Jost, & Goldsmith, 2010; McCright & Dunlap, 2011a).

#### *An Attitude-Participation Gap in Minority Engagement*

Although U.S. minorities often report higher levels of environmental concern than their White counterparts, they nevertheless remain substantially underrepresented in a wide range of environmental organizations and professions. For instance, an analysis of occupational disparities revealed that despite constituting 38% of the U.S. population and nearly one-third of the U.S. science, technology, engineering, and math (STEM) workforce, non-Whites account for only 10-15% of environmental science professionals (Pearson & Schuldt, 2014). These findings mirror disparities in the U.S. environmental sector more generally. A study of 293 U.S. environmental non-profits, government agencies, and grant-making foundations found that non-

Whites comprised no more than 16% of staff in all three types of institutions (Taylor, 2014).

Within academia, a similar picture emerges. A survey of U.S. faculty across 17 environmental disciplines revealed only 11% minority representation, with a majority of faculty reporting having either one or no faculty of color in their department (Taylor, 2010).

Efforts to address racial and ethnic disparities in the environmental sector have frequently promoted the importance of environmentalism in public outreach, and in so doing, appear to assume that low environmental concern is the chief barrier to engagement—an assumption at odds with the high levels of environmental concern expressed by U.S. racial and ethnic minorities and lower-income individuals, discussed above (e.g., Dietz et al., 2007; Guber, 2013; Leiserowitz & Akerlof, 2010). Moreover, surveys reveal substantial numbers of racial and ethnic minorities who are qualified to work in the environmental sector (Taylor, 2010, 2014). Thus, other factors may be at play.

Although the above findings document a persistent and substantial attitude-participation gap in minority engagement, theoretically-informed approaches aimed at bridging this gap are lacking. Whereas much of the focus, to-date, has been on key structural barriers, such as insular hiring practices and limited minority outreach, that impede the recruitment and retention of racial and ethnic minorities within the environmental sector (see Taylor, 2014, for a review), in the following sections, we explore psychological processes that may contribute to the attitude-participation gap and represent additional pathways for intervention.

### **Motivational Barriers Across Groups**

Research suggests that differing group concerns – particularly related to differing levels of vulnerability to harms associated with environmental hazards – are central to understanding

how majority and minority groups engage with the problem of climate change and assess its risks.

According to the differential vulnerability hypothesis, non-Whites in the United States may feel more vulnerable to the effects of climate change than Whites, in part, because of their less privileged position in society (Flynn, Slovic, & Mertz, 1994; Satterfield, Mertz, & Slovic, 2004). Consistent with this hypothesis, Adeola (2004) found that disproportionate exposure to environmental hazards predicted Blacks' greater perception of a wide range of environmental risks, including those associated with industrial emissions. Similarly, in a nationally-representative U.S sample, Satterfield et al. (2004) found that the racial/ethnic gap in environmental concern was partially accounted for by non-Whites' greater awareness of disproportionate environmental hazards and greater perceived vulnerability – effects obtained independent of those of income, education, and political orientation (see also Mohai, 2003).

Similar effects have been documented for lower income individuals. Stokes, Wike, and Carle (2015) reported that Americans making less (vs. more) than \$50,000 a year were more likely to believe that climate change is a very serious problem and were more concerned that it would harm them personally. Whereas this result may partly reflect the economic means of wealthier individuals to adapt to threats posed by climate change (see Macias, 2016b; and Semenza et al., 2008), poorer people may feel a heightened sense of vulnerability to negative impacts both because they lack financial means and because the places where they typically live and work are more vulnerable to climate impacts (Crona, Wutich, Brewis, & Gartin, 2013; Mirza, 2003; Swim et al., 2009).

These differences in risk perceptions mirror the reality that low-income and minority communities in many industrialized nations suffer disproportionately from a wide range of

environmental hazards, as mentioned above. For instance, due to persistent racial segregation and discrimination in the real estate economy, U.S. Blacks and Latinos are substantially more likely to live near hazardous industrial sites and high-pollution-emitting power plants (Bolin, Grineski, & Collins, 2005; Bullard et al., 2011; Jones & Rainey, 2006; Mohai, 2008). As a result, non-Whites and experience higher levels of smog exposure than equivalent-income Whites, with racial disparities in exposure up to 20 times greater than disparities by income (Clark, Millet, & Marshall, 2014).

#### *Differential Motives in Climate Change Engagement*

Given their greater vulnerability and awareness of inequities (Satterfield et al., 2004), racial and ethnic minorities and members of other socioeconomically disadvantaged groups may be motivated by concerns that are less rooted in political orientation (i.e., party identification or political ideology) compared to Whites and members of advantaged groups. Consistent with this reasoning, in a large nationally representative survey of the U.S. public, we (Schuldt & Pearson, 2016) found that relative to Whites, racial and ethnic minorities' climate change views were less politically polarized (and also were more weakly correlated with their willingness to self-identify as an "environmentalist"). Most strikingly, political ideology, a variable that strongly predicts climate polarization in the U.S., was substantially less predictive of the climate beliefs of non-Whites relative to Whites. This same pattern held across a range of related beliefs, including belief in the existence of climate change, perceptions of the scientific consensus, and support for mitigation efforts (regulating greenhouse gases). Thus, factors that strongly predict Whites' opinions on climate change and shape the dominant narrative about the partisan gap – namely, political orientation and self-identifying as an environmentalist – are relatively weak predictors for minorities.

Similar effects have also been obtained for socio-economic status, whereby lower-income and lower-educated individuals also show weaker polarization of climate change opinions, relative to those with higher incomes and education levels (see Pearson et al., 2017, for a review). These findings suggest that, consistent with their heightened awareness of environmental risks, the climate change attitudes and beliefs of racial and ethnic minorities and of members of other socioeconomically disadvantaged groups may be less partisan and less ideologically-driven compared to those of Whites and members of socioeconomically advantaged groups.

Notably, within the U.S., there is also evidence of differential political polarization between advantaged and disadvantaged groups in the perceived dangers posed by climate change. Figures 2 and 3 show the percentage of Whites versus non-White minorities and lower-income versus higher-income Americans, respectively, who indicated that the “rise in the world’s temperature” is “extremely” or “very” dangerous from the 2000 and 2010 General Social Surveys. As seen in the figures, the concerns of Whites and higher-income Americans grew more politically polarized over this time period, in line with the familiar trend seen in public opinion research and commonly reported in news media on climate change (see Dunlap et al., 2016). In sharp contrast, the concerns of non-Whites and lower-income respondents showed little evidence of political polarization in either 2000 or 2010. Similar trends have been documented for educational attainment in the U.S., with increasing polarization of climate opinions among more educated Americans between 2001 and 2016 (see Dunlap et al., 2016).

Taken together, these findings suggest that advantaged and disadvantaged group members’ responses to climate change may be rooted in different motivations and concerns, with partisan perspectives and ideological concerns more strongly accounting for the responses of the

former, and concerns about equity, health, and community impacts more strongly influencing the responses of the latter. Consistent with this perspective, Ehret, Sparks, and Sherman (2016) found that higher levels of education led to increased attention to and awareness of elite political cues (e.g., partisan news media, political candidate speeches), which was associated with the stronger adherence to partisan positions on climate change and the environment. In contrast, as previously noted, members of disadvantaged groups show greater awareness of the risks of climate change and their vulnerability to its impacts, and indicate stronger support for climate policies as a consequence.

These findings have important implications for efforts to broaden public engagement on climate change. Groups for whom the issue of climate change is less politically charged, such as racial and ethnic minorities and members of socioeconomically disadvantaged groups, represent key audiences for bridging partisan disagreements and building policy consensus. Social psychological research suggests that intersectional or “dual identity” groups (e.g., non-White and lower-income conservatives) are uniquely positioned to act as a communication gateway between groups that represent the respective sources of their dual identity, and have the potential to garner trust from both groups. Levy, Saguy, van Zomeren, and Halperin (2017), for instance, found that the mere presence of a group with a dual identity (Israeli Arabs) can lead to reduced conflict and improved intergroup relations, even in high conflict settings (as a bridge between Israelis and Palestinians). The presence of individuals with intersecting identities can also disrupt stereotypical and heuristic modes of thinking and can signal to oppositional groups that a common identity with shared perspectives, incorporating viewpoints of both groups, is possible (see Gaertner & Dovidio, 2000).

Strategic messaging that focuses on political disagreements at the expense of other concerns (e.g., disproportionate impacts of climate change, unequal access to green jobs) may be relatively ineffective for engaging members of disadvantaged groups, whose views on the issue may be less partisan-driven (Schuldt & Pearson, 2016). Researchers and practitioners would also be wise not to mistake some minority groups' lower identification as "environmentalists" – a term that may signal other identity-relevant information, such as race or class membership (see the next section) – with a lack of concern about climate change or other environmental issues.

#### *Stereotypic Representations as Barriers to Engagement*

Research on variability in disparities across different science and engineering fields may offer insights into factors that perpetuate environmental occupational disparities, as well as impede broader engagement with environmental organizations and professions more generally. A look at research on gender disparities in science and engineering is illustrative. In their comprehensive review, Cheryan, Ziegler, Montoya, and Jiang (2017) identify two key factors that reduce women's sense of belonging and contribute to larger disparities (greater male representation) in engineering fields compared to math and the life sciences: stronger gender stereotypes (e.g., masculinity) associated with engineering, and limited early exposure to female role models in engineering compared to math and life sciences. Below, we examine evidence that each of these general factors – stereotypes and limited representation of role models – may undermine minority engagement within the environmental sector.

Public perceptions of scientists as white and male have remained largely unchanged within U.S. society over the past half century (Steinke et al., 2007). However, recent findings suggest environmental STEM fields may face a dual burden, contending with both STEM *and* environment-specific stereotypes that may contribute to uniquely high disparities in

environmental fields. In an online survey of U.S. adults (Pearson & Schuldt, 2015), participants indicated the extent to which they associated the terms “Environmentalist,” “Scientist,” and “Engineer” with each of four racial/ethnic groups: White/European Americans, Black/African Americans, Latinos, and Asian Americans, using 7-point scales (1=Not at all to 7=Very much). Only the category White was rated significantly above the scale midpoint (4) for the term “environmentalist,”  $t(167) = 9.74, p < .001$ , and Whites were more strongly associated with the term environmentalist compared to all other groups (all pairwise  $ps < .001$ ). All other non-White racial and ethnic categories were significantly below the scale midpoint ( $ts$  from -6.42 [vs. Black/African Americans] to -2.10 [Asian Americans],  $ps < .04$ ), indicating a dissociation between these groups and the term “environmentalist.” In contrast, Asian Americans were positively associated with the terms “scientist” and “engineer,” relative to the midpoint ( $ts > 5.45, ps < .001$ ), and Blacks were more strongly associated with these terms (albeit still below the scale midpoint) than with the term “environmentalist” ( $ps < .01$ ). Moreover, both White and non-White participants more strongly associated Whites with the term environmentalist than all other racial and ethnic groups (all paired-sample  $ps < .001$ ).

A recent nationally-representative survey lends additional support for these findings and highlights the unique challenges facing environmental organizations and advocacy groups. In a representative survey of U.S. adults conducted April-May of 2016, we (Pearson et al., 2017) found that both Whites and non-Whites strongly associated “environmentalists” with the racial category White. Moreover, both groups strongly *dissociated* non-White minority group (Blacks, Latinos, and Asians) with the category “environmentalists” relative to the midpoint of the scale. We also found strong consensus on age and class stereotypes related to income and education, such that the term “environmentalist” was associated with being young, moderately wealthy, and

highly educated. These class stereotypes were similarly widely shared and varied little by respondent race/ethnicity, income, or education level.

Theory and research suggest that stereotypes can operate as powerful cues to belonging, signaling whether a group or domain is compatible with one's social identity. According to the identity-based motivation framework (IBM; Oyserman, Fryberg, & Yoder, 2007), people are particularly likely to engage in behaviors that are seen as congruent with their racial group identity ("ingroup-defining") and to avoid behaviors that are seen as incongruent with their identity. Oyserman and colleagues (2007) found that lower-income African American and Latino youth perceive healthy eating and exercise as identity incongruent and consequently expressed lower motivation to engage in these behaviors when their racial/ethnic identity was made salient. Additional studies have directly linked stereotype accessibility to identity congruence. When African Americans and Latinos were prompted to consider stereotypes about their in-groups as self-defining, they showed decreased preferences for healthy foods and increased preferences for unhealthy foods (Rivera, 2014). Thus, factors beyond awareness of climate change and its risks, such as stereotypic associations with the terms "environmentalist" and "environmentalism," which may evoke concerns about the compatibility of one's identity with those in environmental organizations, may also contribute to disparities in the environmental sector (see Jones, 2002; and Mohai, 2003).

Race and class-based stereotypes may also extend to notions of the "environment" and "environmentalism" in ways that similarly impede public outreach efforts. For instance, the use of non-urban imagery and a common focus on the preservation of natural and uninhabited spaces in conservation advocacy may signal that the perspectives and concerns of non-represented groups – and particularly those in urban areas – are not valued. Indeed, studies of environmental

media reveal a strikingly narrow range of imagery used to depict the environment in both online and print media. For instance, in their analysis of the first 400 google image search results for the word “ecosystems,” Medin and Bang (2014) found that 393 (98.2%) did not include humans, 4 (1%) had humans within the ecosystem, and 3 (0.8%) had humans outside looking in. Moreover, they found that European American (but not Native American) narratives in children’s books tend to position human beings as apart from nature, rather than as part of it. Such depictions may unwittingly alienate individuals for whom environmental issues are also urban issues with significant human dimensions.

Psychological research on stereotyping and identity threat can help guide the development of interventions to combat environmental stereotypes and their transmission. Low representation of minority groups in environmental organizations, and particularly among those in leadership roles, may perpetuate stereotypic beliefs about environmental groups as non-inclusive, and, in turn, undermine minorities’ identification with non-diverse environmental groups and their initiatives. In one experiment examining gender disparities in STEM (Murphy, Steele, & Gross, 2007), university students were shown one of two versions of a 7-minute promotional video for an upcoming science and engineering leadership conference that depicted either a gender-balanced or a gender-unbalanced (3:1, male to female) ratio of attendees. Compared to those in the gender-balanced condition, women in the gender-unbalanced condition showed elevated stress and reported a lower sense of belonging and less interest in attending the conference. Thus, visible cues of low representation can reinforce notions that women do not belong in a stereotypically male-dominated domain. Nevertheless, stereotypic beliefs are malleable. In one experiment, simply reading a short (200-word) news article that computer scientists no longer fit the male stereotype significantly increased women’s career interests in

computer science (Cheryan, Plaut, Handron, & Hudson, 2013; see also Cheryan, Plaut, Davies, & Steele, 2009). Similar studies testing the malleability of environmental stereotypes represent a promising avenue for future research.

Finally, early exposure to science through both formal (e.g., secondary education) and informal learning environments (e.g., news media, entertainment, museums) has been shown to predict professional engagement later in life. Access to field-specific coursework – a primary means through which people may be exposed to ingroup role models – has been shown to predict reduced gender disparities (Cheryan et al., 2017). Nevertheless, early exposure may also *widen* disparities if this exposure reinforces cultural stereotypes and undermines a sense of belonging for members of underrepresented groups. Thus, future research might examine how early experiences with both formal and informal environmental education and experiences may exacerbate or reduce existing disparities, as well as the stereotype processes that are presumed to mediate these disparities.

#### *Perceptual Barriers and Norm-Based Messaging*

Misperceptions of group norms related to Whites' and non-Whites' environmental engagement may also impede diversity efforts within the climate movement. Numerous studies document the power of social norms in guiding sustainability-related behavior (Miller & Prentice, 2016). Individuals are more likely to avoid littering, conserve energy, and save water when a majority of others in close proximity do the same (Nolan et al., 2008). Moreover, normative influence can outweigh cost savings in driving conservation behavior. In one field experiment, making energy-conscious choices visible to others (a non-financial reputational incentive) was more effective at increasing participation in an energy blackout prevention

program in California than a \$25 monetary incentive, leading to over four times the rate of compliance (Yoeli, Hoffman, Rand, & Nowak, 2013).

Work on identity threat and identity-based motivation suggests that minority group members may be particularly sensitive to norms that signal what behaviors are appropriate and preferred by their group (Oyserman & Lewis, 2017; Oyserman et al., 2007). When behaviors are believed to be normative (i.e., what “people like me” do), minority individuals are more likely to engage in personal, political, and social causes (Oyserman et al., 2007). In the absence of such normative information, people may look to the visible representations of their group in organizations and decision making (e.g., the group memberships of those in leadership roles within the environmental sector; Taylor, 2014). Moreover, research suggest that norm conformity can occur even when the perceived norm is stigmatizing for members of a particular social group, and when members of the stigmatized group are motivated to avoid conforming. For instance, in a field experiment in rural India, Hoff and Pandey (2006) provided unacquainted schoolchildren with a monetary incentive to solve as many simple puzzles as possible out of a set of 15. In one version of the experiment, children’s caste membership was made public before completing the puzzle task. When the participants’ caste was publicly known, the motivation and performance of lower-caste students (but not of other students) declined markedly compared to a condition in which the caste was unknown, consistent with the low achievement stereotype of lower-caste groups. Thus, when individuals are identified as members of a stigmatized group, they may respond behaviorally by conforming to stereotypic beliefs, even when they are motivated to avoid doing so (e.g., when counterstereotypic actions are incentivized).

Given the positive connotations associated with pro-environmentalism (Steg & Vlek, 2009), being perceived as a member of a group that is relatively unconcerned about the

environment (compared to other groups) may be similarly stigmatizing and, to the extent that these perceptions are internalized among minority group, may impede engagement among groups that are negatively stereotyped within the environmental sphere (e.g., non-Whites and those with lower income and education levels). We explore these normative influence processes below.

Despite evidence that salient group norms can shape behavior, few studies have investigated whether perceptions of attitudinal and behavioral ingroup norms around environmentalism (e.g., which groups are most concerned about climate change) vary among different racial and ethnic groups. Negative consequences of *misperceiving* ingroup norms, such as holding the belief that one's private views deviate from the consensus views of one's group (i.e., "pluralistic ignorance;" Prentice & Miller, 1993) – are well-documented. These include attitudinal and behavioral conformity to the perceived ingroup norm (Botvin et al., 1992; Prentice & Miller, 2003), feelings of alienation and disidentification with a particular domain (Prentice & Miller, 1993), and reduced willingness to share opinions about contentious topics. Research investigating pluralistic ignorance in the context of climate change has documented self-silencing among those most concerned about the issue (Geiger & Swim, 2016), and recent survey findings suggest that self-silencing in discussions around climate change may be particularly common among non-Whites: In a nationally-representative sample, whereas 53% of Whites reported being willing to admit differing viewpoints about climate change in discussions with family and friends, only 26% of Blacks and 34% of Latinos report a similar willingness to do so (Speiser & Krygsman, 2014). Thus, documenting the nature and extent of pluralistic ignorance in the context of climate change among racial and ethnic minority groups remains a critical avenue for future research.

Initial evidence for the importance of perceived ingroup norms in non-Whites' climate change engagement was obtained in a study with a racially and socioeconomically diverse online sample of U.S. adults (Pearson et al., 2017)<sup>1</sup>. In this study, ingroup pluralistic ignorance about climate change (operationalized as self minus perceived racial/ethnic ingroup concern, controlling for mean levels of self-concern) was assessed, along with perceived individual and collective efficacy about climate change and environmental citizenship (social, economic, and political engagement with environmental organizations and initiatives). Environmental efficacy (Ojala, 2012) included items assessing individual efficacy (e.g., "I think that I myself can contribute to the improvement of the climate change situation") and collective efficacy (e.g., "I believe that together we can do something about the climate threat"), rated on a scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Environmental citizenship (Stern et al., 1999) included summed yes/no responses to seven questions (e.g., "In the last twelve months, have you read any newsletters, magazines or other publications written by environmental groups?"; "Boycotted or avoided buying the products of a company because you felt that company was harming the environment?"; "Voted for a candidate in an election at least in part because he or she was in favor of strong environmental protection?").

When controlling for political ideology, across all respondent groups, a greater perceived gap between self and ingroup concern predicted lower efficacy beliefs about climate change (beta = -.15,  $p = .006$ ), and lower environmental citizenship (beta = -.26,  $p < .001$ ), with stronger effects shown for racial and ethnic minority respondents. Moreover, when self and perceived ingroup concern about climate change were included simultaneously in regression analyses that

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<sup>1</sup> The sample consisted of 406 MTurk respondents; age ranged from 18 to 77 years ( $M_{age} = 34.8$ ). The sample was 29.6% White ( $n = 120$ ), 24.1% Black/African American ( $n = 98$ ), 20.4% Latin/Hispanic ( $n = 83$ ), 15.5% Asian/Asian American ( $n = 63$ ), and 10.3% "other" ( $n = 42$ ). About half of participants (47.6%) had either an Associate's or Bachelor's degree and a majority (51.8%) indicated an annual income of \$40,000 or less.

included the same covariates, perceived ingroup concern about climate change predicted Asian (beta = .32,  $p = .03$ ), Black (beta = .23,  $p = .02$ ) and Hispanic (beta = .27,  $p = .02$ ) respondents' environmental citizenship and was the sole significant predictor of Hispanics' and Asians' citizenship, but only self-concern (not perceived ingroup concern) predicted Whites' environmental citizenship (beta = .28,  $p = .01$ ). Moreover, these effects could not be explained by differences in intergroup attitudes (Wolsko, Park, & Judd, 2006), political ideology (liberalism-conservatism), or socially desirable responding (Dunton & Fazio, 1997), and remained significant when these variables were included as covariates in the models.

These findings suggest that perceived ingroup attitudinal norms about climate change may shape non-Whites' perceptions of individual and collective efficacy around climate change and undermine their engagement with environmental organizations and initiatives. Norms-based interventions appear especially promising for motivating environmental engagement among individuals from more collectivistic cultures, such as individuals from East Asian countries and U.S. Hispanics and Latinos. For instance, Eom, Kim, Sherman, and Ishii (2016) found that whereas environmental concern predicted pro-environmental consumer choices among European Americans but not Japanese, perceived ingroup norms were the stronger predictor among Japanese. Thus, future studies should also consider the broader cultural orientations of different demographic groups in assessing the potential effectiveness of norm-based messaging in environmental outreach and advocacy work.

### **Implications for Organizational Outreach and Policy**

The research reviewed in the previous section suggests that the lack of diversity in the environmental domain may be rooted, in part, in different motivational barriers that exist across majority and minority groups—motivations that are rooted in *social* barriers, such as prevalent

racial, ethnic, and class stereotypes and a lack of visible representation in the environmental sector. Recognition of these barriers affords new pathways for interventions, and in particular, outreach efforts that aim to create a broader and more inclusive climate movement. Messages that accurately reflect the high levels of concern among non-White and lower-income groups and key contributions of people of color, and especially those within leadership roles (see Green 2.0's "Leadership at Work" initiative for a notable example), may be particularly effective for engaging groups that remain underrepresented in environmental discourse and decision making.

#### *Diversity Messaging to Promote Inclusion*

Within organizations, "colorblind" messaging that focuses on member similarities and avoids issues of race and ethnicity can signal that these identities are not valued, and, in turn, can fuel distrust of these organizations, particularly when they have low diversity. In a series of experiments, Purdie-Vaughns, Steele, Davies, Ditlmann, and Crosby (2008) showed Black professionals corporate brochures that depicted either many or few minority staff-members, coupled with an organizational mission statement emphasizing colorblindness or one emphasizing the value of diversity. Participants were then asked for their opinions about the organization. Those exposed to a colorblind message, when that message was also coupled with images depicting low minority representation, were less comfortable envisioning themselves as an employee, less trusting of the organization's management, and more concerned about how others in the organization would treat them.

Whites' attempts to be colorblind can alienate minorities, who generally seek acknowledgement of their racial identity, and fuel interracial distrust. For instance, Apfelbaum, Sommers, and Norton (2008) found that although avoidance of race in conversations was seen by Whites as a favorable strategy for promoting positive interracial interactions, in practice, the

failure to acknowledge race in conversations, when relevant, resulted in *greater* perceptions of racial prejudice by Black interaction partners. Moreover, racial colorblindness extends to perceptions of environmental impacts and government responses to those impacts. For instance, whereas a large majority (71%) of African American respondents attributed the disproportionate effects of Hurricane Katrina on minority communities to the persistence of racial inequality in the U.S., only 32% of Whites believed the same (Doherty, 2015). Similarly, whereas two-thirds (66%) of African Americans indicated that the government's response to Hurricane Katrina would have been faster if most of the victims had been white, just 17% of Whites agreed.

These findings highlight a problem for environmental organizations that seek to diversify their memberships or broaden their appeal, but fail to sufficiently address disparities in environmental impacts or the potentially differing needs and concerns of underrepresented communities. By contrast, *multicultural* organizational practices, which seek to acknowledge both differences as well as shared perspectives among members and prospective members, can foster mutual understanding and promote a sense of belonging among members of historically marginalized groups. At the same time, messaging that emphasizes differences alone can be viewed as coercive. *Tailored inclusion* that highlights the dual identities of minority groups, connecting subgroup identities with broader American society, may be a more effective approach when developing inclusive messaging for advocacy and community outreach (see Lewis & Oyserman, 2016). At present, limited research has examined messaging on diversity in the context of environmental issues, and organizational outreach efforts stand to benefit from future research in this area.

*Bridging Science and Practice: Insights from Public Health*

Psychologists are uniquely positioned to develop behavioral interventions that are “wise” to both the social contexts and underlying psychological processes that shape adaptation and mitigation behavior (see Walton, 2014; and Clayton et al., 2015). To maximize their impact, behavioral interventions need to be appropriately tailored for different audiences and sensitive to their social context, and to set in motion new thought processes or behaviors that can be sustained over time (Cohen et al., 2017; Cunningham & Card, 2014). In developing these interventions, scholars and practitioners may benefit from incorporating insights from evidence-based approaches that have seen real-world success outside of the domain of climate change.

For instance, like the problem of climate change, the HIV/AIDS epidemic is global in reach, has both biophysical and social causes, and disproportionately affects communities of color and other socio-economically disadvantaged groups (Pellowski, Kalichman, Matthews, & Adler, 2013). Research on health disparities related to the HIV epidemic highlights not only ways in which risks can be effectively communicated to different segments of the public, but also ways that organizations can involve at-risk groups in decision making processes that can influence public policy. Through initiatives such as the “Face of AIDS” and the “Global Village” that emphasize social dimensions of the epidemic, the International AIDS Conference (IAC) – a global forum of scientists, practitioners, and communities directly affected by HIV – has successfully pressured governments and corporations to seek universal global access to preventive treatments and to collaborate in developing evidence-based solutions (Brecher & Fisher, 2013).

Psychological research on health disparities also offers a powerful blueprint for understanding *how* to design, evaluate, and effectively disseminate interventions to effect behavior change that may prove useful for combating climate change (e.g., reducing energy use;

Swim, Geiger, & Zawadzki, 2014) and helping communities adapt to its impacts. For example, research suggests that highlighting “healthy” in the domain of food consumption can backfire, making healthy food less identity congruent for minority groups (Gomez & Torelli, 2015). Similarly, emphasizing protection of the natural environment (e.g., non-urban spaces) in the context of climate change may undermine the identity-congruence of climate actions among historically marginalized groups who may view the issue primarily through the lens of public health, economics, and community engagement (see Bullard et al., 2011). Practically, initiatives such as the U.S. Center for Disease Control’s High Impact HIV/AIDS Prevention Project (HIP) and Prevention Research Synthesis (PRS) Project provide working models for the effective delivery of behavioral interventions to mitigate health risks among disproportionately affected groups that might be productively translated to the climate context. The PRS includes an online compendium of nearly 100 evidence-based behavioral interventions and best practices, with intervention materials packaged into user-friendly kits that are freely accessible to state and local governments ([effectiveinterventions.org](http://effectiveinterventions.org); see Norton et al., 2009). Presently, no similar programs exist for evaluating and broadly disseminating climate-related behavioral interventions to different segments of the public – an important direction for future psychological research (see Brecher & Fisher, 2013).

### **Conclusion**

As this chapter and the others in this volume make clear, climate change is not only a formidable technical challenge, but also a complex social challenge that will require multifaceted social solutions. We have focused on the opportunities afforded by adopting a diversity science approach to climate change, one that leverages the extensive literature on group processes within social and organizational psychology, to explore how social identities impact environmental

engagement, including on the issue of climate change. Although racial and ethnic disparities within the environmental movement are well-documented (see Taylor, 2014), the approach we describe here highlights key psychological processes (e.g., differing group motives, stereotypic representations, and normative perceptions) that may contribute to these disparities and impede efforts to broaden public engagement on climate change. Importantly, these processes also point to promising pathways for future research and intervention.

Our hope is that this approach offers a blueprint of the types of diversity-related questions that may be examined from the perspective of social psychological research and theory. For example, what types of messages are best for changing misconceptions about low minority concern? What kinds of media are most effective for enhancing environmental advocacy and professional engagement among underrepresented minority groups? Moreover, our review focused primarily on racial and ethnic disparities; however, identity-based approaches may be similarly fruitful for understanding a broader range of identity factors, such as gender and religious identities, which have also been shown to predict how people perceive and respond to climate change and organizations working to address it (e.g., Pearson et al., 2017).

The differential impacts of climate change pose a unique challenge for motivating sustained collective action on the issue. Collective threats can enhance the salience of shared aspects of identity in ways that motivate cooperation (Dovidio et al., 2004). Nevertheless, cooperation can be difficult to sustain over time, and particularly in the face of inequities that highlight group differences (Aquino, Steisel, & Kay, 1992; also Piff et al., 2010). Identifying the conditions under which people form and maintain shared identities around threats with asymmetric causes and effects is thus a critical question for future research. Moreover, few studies have examined *which* identity dimensions (e.g., perceived similarity vs. group

investment; see Masson & Fritsche, 2014) matter for climate engagement, or examined causal effects of identity on climate risk perceptions – another important area for psychological inquiry.

Research on social disparities in the context of climate change has the potential not only to inform policy, but also yield new insights about group processes. For example, understanding racial/ethnic and class disparities in environmental STEM may inform our understanding of factors contributing to *heterogeneity* in disparities, generally, across STEM fields – an emerging direction for STEM diversity research (see Cheryan et al., 2017). More generally, the context of climate change provides an opportunity to examine how stereotyping and identity processes shape self-perceptions and collective action within a politicized and moralized domain (Steg & Vlek, 2009).

Finally, the global reach of climate change highlights an urgent need for research that goes beyond U.S. and industrialized contexts to examine how identity processes and intergroup dynamics influence climate change understanding and action beyond the partisan divide, and particularly in countries and regions that shoulder a disproportionate burden of climate impacts. Despite the need for international cooperation and consensus-building, cross-national comparative research on racial, ethnic, and socioeconomic diversity is currently lacking. Moreover, few studies have explored ways in which non-partisan social identities, such as race/ethnicity, class, and gender, may interact to influence climate change engagement. In addition to highlighting the importance of considering social justice and equity motives in environmental decision making, our review suggests that racial and ethnic minorities and members of other socioeconomically disadvantaged groups represent critical “gateway” audiences for bridging growing partisan disagreements on climate change. Increasing attention to these factors, and the role of diversity more generally in public engagement on climate change,

can enhance understanding of key barriers to participation in climate discourse and decision making.

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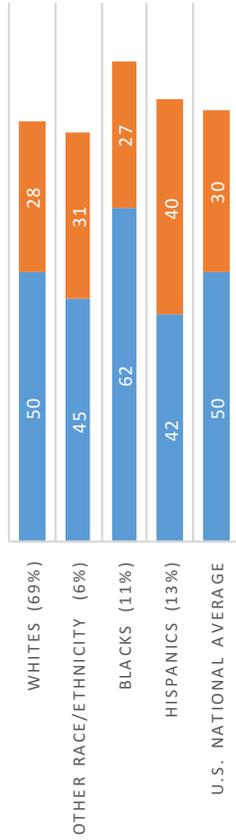
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*Figure 1.* Percentage of U.S. respondents supporting climate and energy policies by race/ethnicity, from Leiserowitz and Akerlof (2010). Items include support or opposition to regulating carbon as a pollutant; providing a government subsidy to replace household appliances that would cost the average household \$5 a month in higher taxes; establishing an energy efficiency fund to help make buildings more energy efficient and teach Americans how to reduce their energy use; and increasing taxes on gasoline by 25 cents per gallon and returning the revenues to taxpayers. Results are aggregated from Leiserowitz and Akerlof (2010) and based on a nationally representative survey of 2,164 U.S. adults. Racial/ethnic categories include Hispanics (13%), Blacks (11%), Other race/ethnicity (6%), and Whites (69%). See Leiserowitz and Akerlof (2010) for additional survey items and methodology.

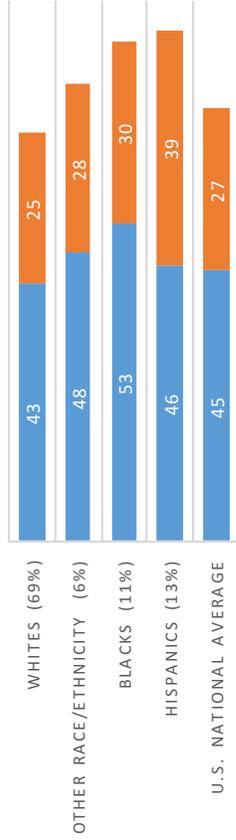
### REGULATING CARBON

■ % somewhat support ■ % strongly support



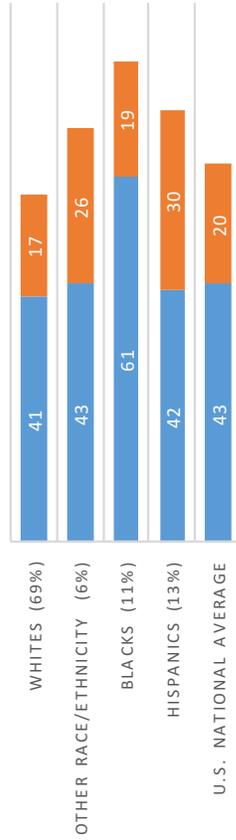
### APPLIANCE EFFICIENCY TAX

■ % somewhat support ■ % strongly support



### ENERGY EFFICIENCY FUND

■ % somewhat support ■ % strongly support



### GAS TAX

■ % somewhat support ■ % strongly support

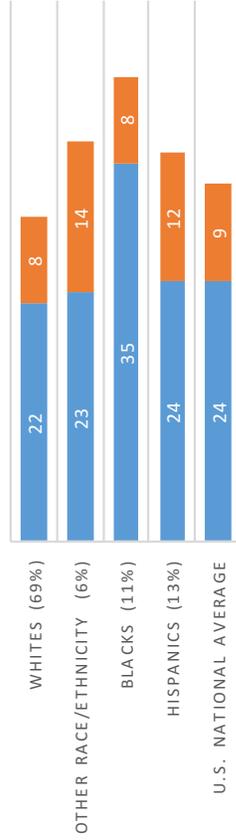
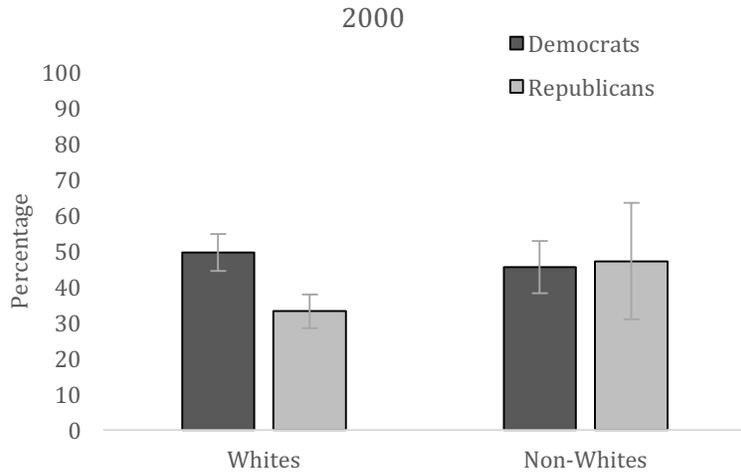


Figure 2. Weighted percentage of U.S. respondents indicating the “rise in the world’s temperature” is “extremely” or “very dangerous” by race and party affiliation in 2000 (a) and 2010 (b). Error bars represent 95% confidence intervals. Source: General Social Survey.

(a)



(b)

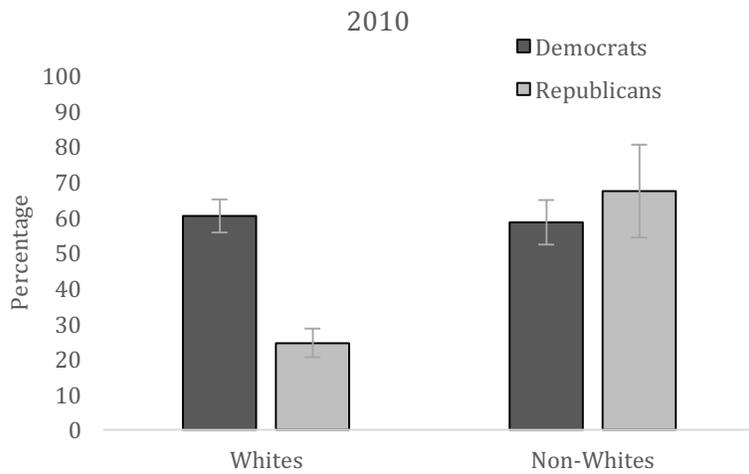
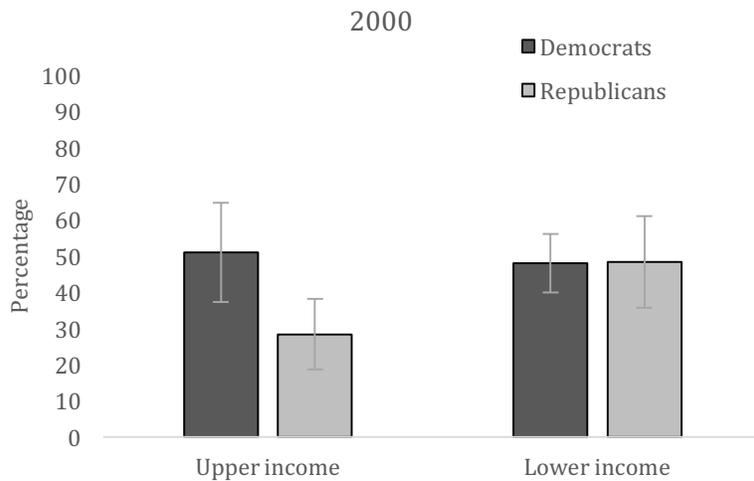


Figure 3. Weighted percentage of U.S. respondents indicating the “rise in the world’s temperature” is “extremely” or “very” dangerous by total household income and party affiliation in 2000 (a) and 2010 (b). Upper and lower income categories approximate the bottom and top quintiles (i.e.,  $\leq \$17499$  vs.  $\geq \$75000$  in 2000;  $\leq \$22499$  vs.  $\geq 110000$  in 2010). Error bars represent 95% confidence intervals. Note: Question wording referenced “greenhouse effect” in 2000 and “climate change” in 2010.

(a)



(b)

