# Public recognition of climate change inequities within the United States

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**Abstract**

Climate change has unequal impacts on socially disadvantaged communities around the globe, including within major emitting nations such as the United States. But to what extent does the public recognize these inequities? We report results from two nationally representative surveys of U.S. adults conducted in May and August-September 2022 ($N = 2101$ total) that asked respondents whether climate change affects "some groups more than others" or "all groups about equally," and that experimentally tested how referencing specific social categories (e.g., "some *racial* groups more than others…") affected responses. Results suggest low recognition of climate inequities among the U.S. public, with only 37 to 44% of respondents correctly recognizing that climate change affects "some groups more than others" across the two surveys. Furthermore, despite robust evidence of the role of race as a determinant of climate-related inequities, just 22% of respondents acknowledged *race-based* climate inequities. Recognition of climate inequities was greater among younger respondents, those with more education, Hispanic respondents, and Democrats. Nevertheless, baseline levels of recognition were low, with fewer than one-third of Democrats and those with a 4-year college or postgraduate degree recognizing race-based inequities. We consider implications of this pervasive "great equalizer" perception for mobilizing public support for policies aimed at addressing climate injustice.

*Keywords:* Climate change, climate justice, race, public opinion, survey experiment

## Introduction

There is now a broad scientific consensus that climate change disproportionately threatens the lives and livelihoods of some groups more than others, namely groups that are already disadvantaged by existing social and economic systems (IPCC, 2022). Economic models suggest that because of reduced agricultural and labor productivity at warmer latitudes, climate change has already reduced the wealth of the world's poorest nations by 25% since 1961 (Diffenbaugh & Burke, 2019). Climate inequities are observed not only between nations but within nations – including wealthy nations, such as the United States – where communities of color, Indigenous, and other socially disadvantaged communities face both elevated climate hazards exposure as well as social, economic, and political marginalization that reduces capacity to prepare for and respond to these hazards (EPA, 2021; Shonkoff et al., 2009; Thomas et al., 2019). For example, Hurricane Harvey devastated racial and ethnic minority and lower-income communities throughout the U.S. Gulf Coast, while White and wealthier enclaves—some mere miles from the most-affected areas—were relatively unscathed (Fernandez, 2018; Flores et al., 2021). Similar inequities have been documented in the aftermath of Hurricane Ian, which destroyed large portions Florida's Gulf Coast in September of 2022, as well as in planning and disaster recovery responses in other coastal regions (Rhodes & Bresbis, 2022). For instance, social and political isolation of African American communities on Maryland's Eastern Shore has limited these communities' access to critical resources and ability to adapt to flooding due to sea level rise (Miller Hesed & Paolisso, 2015).

Despite substantial evidence of the disproportionate vulnerabilities of many marginalized communities within the United States, and a growing emphasis on equity in state and federal policymaking, remarkably few studies have examined public perceptions of climate inequities (see Pearson et al., 2023). Documenting public recognition of the disparate impacts of climate

change is important not only for understanding factors that may shape public support for adaptation efforts to address these vulnerabilities, but also regional and national mitigation policies designed to bolster social equity more generally—a growing area of scholarship (Bergquist et al., 2020; Carman et al., 2022). For instance, the Biden administration's "Climate and Environmental Justice Screening Tool," part of the White House's Justice40 Initiative, aims to identify and direct local, state, and federal investments to disadvantaged communities that experience greater climate risks and other environmental burdens; yet, there is limited research, to date, on the fundamental question of how much the public is aware of these inequities, which may be critical to mobilize and sustain public support for these investments (see Bergquist et al., 2020; Bromley-Trujillo & Holman, 2020; and Bugden, 2022). Public opinion can also shape policy outcomes indirectly, by impacting the priorities of policymakers, industry, and nongovernmental organizations (Rasmussen, Mader, & Reher, 2018). Thus, research that can inform our understanding of public opinion may have important practical implications for advancing local and national climate justice initiatives.

Recent surveys suggest that the public may be largely unaware or misinformed about the unequal climate-related burdens experienced by different demographic groups, and particularly communities of color, within the U.S. For instance, in a 2019 survey of U.S. adults aged 18 to 36 administered by NORC at the University of Chicago, when asked "Do you think the negative effects from climate change are more likely to impact people of color, less likely to impact people of color, or impact people of color about the same as everyone else?," 59% responded "about the same as everyone else" and just 27% responded "more likely to impact people of color" (GenForward Survey, 2019)[1]. By comparison, about equal percentages of respondents

[1] This response pattern was largely similar when broken out by race of the respondent, with 35% of Black, 29% of Latino, and 24% of White respondents indicating that climate change is "more likely to impact people of color."

indicated that climate change is "more likely to impact poor people" (44%) and will impact poor people "about the same as everyone else" (43%). Similarly, in a May 2020 survey of 1,000 U.S. adults also administered by NORC that focused on environmental harms more broadly, Bugden (2022) found that whereas 59% of respondents reported that less affluent people are more likely than wealthier people to experience environmental pollution, only 37% reported that Black Americans are more likely to experience environmental pollution than White Americans (see also Axios, 2021).

Reflecting on these previous survey results, two observations strike us as especially notable. The first is that only a minority of respondents appear to believe that climate impacts are unequally distributed across social groups—whether asked about race *or* class—a pattern that appears to also hold across different racial and ethnic respondent groups (see GenForward Survey, 2019, and Third Way, WE ACT for Environmental Justice, & GreenLatinos, 2022). The second is that respondents are more likely to acknowledge class versus race-based inequality, despite robust evidence that race is a stronger predictor of environmental hazards exposure in the U.S. (Tessum et al., 2021; also EPA, 2021).

What might explain low public recognition of environmental and climate change inequities within the U.S.? As Bugden (2022) notes, prior research on public perceptions of inequality and racial attitudes is informative. Previous studies demonstrate that people substantially underestimate economic inequality within their home countries, which may contribute to underestimation of other inequities, including the differing levels of vulnerability to environmental and climate hazards within U.S. society (Hauser & Norton, 2017). Additional research shows that Americans substantially underestimate persistent racial disparities within the U.S., such as the racial wealth gap, and overestimate racial progress, which may lead people to

overlook the structural barriers faced by people of color in the U.S. (Kraus, Rucker, & Richeson, 2017). Furthermore, racial resentment toward perceived gains of Black Americans and the notion that the U.S. has become a post-racial society (i.e., colorblind racial ideology) may lead the public to specifically reject the notion that *race* is associated with unequal environmental outcomes, or that it is relevant to policies designed to address environmental issues (see Bugden, 2022 for a detailed discussion), a point we return to later. Moreover, like pollution exposures, many well-documented disparities in health and economic impacts of climate change may be largely hidden from public view. For instance, heat exposure is the leading cause of weather-related fatalities globally and disproportionately harms Black and Hispanic Americans, outdoor workers, older adults, and those with pre-existing health conditions; however, heat-related illnesses often present as similar to other medical conditions, making them prone to misclassification (see EPA, 2021; Hsu et al., 2021).

The current study builds on this small but important body of research by reporting on data measuring the public's recognition of climate change inequities from an original nationally representative survey of U.S. adults conducted in May, 2022, and a follow-up question wording experiment conducted in August/September, 2022, which tested whether asking about *racial* inequities, specifically, influenced survey responses ($N = 2101$ total). The goals of the present research were two-fold: to assess current understanding among the U.S. public that the impacts of climate change are unequally distributed across groups within U.S. society (Studies 1 and 2)—and in light of the prior literature reviewed above, across racial groups in particular (Study 2).

The timing of these surveys is also notable. First, in contrast to previous polls on public perceptions of environmental inequities described above, the present data were collected nearly two years after the murder of George Floyd, which ignited a wave of historic protests and

precipitated a national conversation about racial inequality (Reny & Newman, 2021; Sullivan, Eberhardt, & Roberts, 2021). Indeed, analyses of 60-waves of representative survey data showed that awareness of racial discrimination in the U.S. rose sharply in response to the Floyd protests, with similar trends observed across geographic regions and among both White respondents and respondents of color (Reny & Newman, 2021). Heightened attention to racial disparities and systemic racism after George Floyd's murder was similarly documented on social media (Nguyen et al., 2021). Second, the present data were also collected more than two years into the COVID-19 pandemic, during which communities of color experienced substantially higher rates of hospitalization and mortality compared to White Americans (U.S. Centers for Disease Control and Prevention, 2022)—disparities that have been widely covered in the media (Xu et al., 2022).

Thus, the present data were collected following a period of heightened awareness of social injustice, and particularly of racial health and economic disparities within the United States, which may have implications for public perceptions of environment and climate-related inequities. Finally, as previously noted, there has also been a growing emphasis on social equity in both state and federal climate policymaking within the United States, and as well as within the broader climate movement, globally (Jasny & Fisher, 2022). The question of whether these or other factors translate into heightened public recognition of the unequal impacts of climate change – and its disproportionate impacts on people of color, in particular – is one that the timing of our surveys also allows us to explore.

## Method

To examine public recognition of climate inequities across demographic groups, we analyzed data from two nationally representative surveys of U.S. adults ($N$ = 2101 total)[2] administered for us by Verasight. The first survey (Study 1) was fielded May 11–23, 2022 (N = 1084). The second survey (Study 2) was fielded August 26–September 1, 2022 (N = 1017) and served to replicate the findings of the first survey and to test how referencing racial categories or inequities within the U.S. via a question wording experiment affected responses.

The samples for both surveys were drawn from a combination of random address-based sampling (ABS) and Verasight's standing panel of survey respondents. Verasight calculates survey weights using Current Population Survey benchmarks of key demographics (i.e., age, education, race and ethnicity, sex, and partisanship) which we incorporate into the analyses reported below. Each survey took approximately 10 min to complete. Table 1 contains a summary of the sample demographics for both surveys. The surveys were sponsored by grants from the Cornell Center for Social Sciences and the Einhorn Center for Community Engagement and were approved by the Institutional Review Board at Cornell University.

Table 1. Summary of analytic sample demographics for both surveys (unweighted) (N = 2,101 total)

| | | Study 1 (N = 1,084) | Study 2 (N = 1,017) |
|---|---|---|---|
| Sex | | | |
| | Female | 566 (52.2%) | 536 (52.7%) |
| | Male | 514 (47.4%) | 476 (46.8%) |
| | Other | 4 (.4%) | 5 (.5%) |
| Age | | | |
| | 18 to 34 | 289 (26.7%) | 244 (24.0%) |
| | 35 to 50 | 309 (28.5%) | 288 (28.3%) |
| | 51 to 64 | 253 (23.3%) | 253 (24.9%) |
| | 65 or above | 233 (21.5%) | 232 (22.8%) |

[2] This is the final analytic sample size. In accordance with our IRB permissions, nine respondents (six from Study 1 and three from Study 2) were omitted from analysis because they indicated their age was less than 18 years.

| | | |
|---|---|---|
| Education | | |
| Some high school or less | 59 (5.4%) | 31 (3.0%) |
| High school graduate or GED | 256 (23.6%) | 263 (25.9%) |
| Some college, no degree | 228 (21.0%) | 198 (19.5%) |
| 2-year or associate degree | 99 (9.1%) | 116 (11.4%) |
| 4-year or bachelor degree | 256 (23.6%) | 238 (23.4%) |
| Post-graduate degree | 186 (17.2%) | 171 (16.8%) |
| Race | | |
| Black or African American | 158 (14.6%) | 137 (13.5%) |
| Pacific Islander | 0 (0%) | 2 (.2%) |
| Asian or Asian American | 55 (5.1%) | 45 (4.4%) |
| White | 810 (74.7%) | 763 (75.0%) |
| Native Amer. or Amer. Indian | 10 (.9%) | 14 (1.4%) |
| Mixed race | 27 (2.5%) | 20 (2.0%) |
| Some other race | 24 (2.2%) | 24 (2.4%) |
| *Missing* | 0 (0.0%) | 12 (1.2%) |
| Ethnicity | | |
| Hispanic | 167 (15.4%) | 131 (12.9%) |
| Non-Hispanic | 917 (84.6%) | 886 (87.1%) |
| Partisanship | | |
| Democrat | 430 (39.7%) | 399 (39.2%) |
| Republican | 324 (29.9%) | 292 (28.7%) |
| Independent | 232 (21.4%) | 238 (23.4%) |
| Other or none | 98 (9.0%) | 88 (8.7) |

*Measures*

*Recognition of climate change inequities*. Our standard question measuring recognition of climate change inequities read: “Do you think that climate change affects some groups more than others, or does it affect all groups about equally?” (response options: *Some groups more than others*, *All groups about equally*, *Not sure*). In Study 1, every respondent was presented with this standard version of the question, which was deliberately phrased in general terms to capture baseline recognition of *any* social disparities in climate impacts, given the many groups that suffer disproportionate impacts from climate change (e.g., racial and ethnic minority groups, people living in small island and developing nations, women, the elderly; IPCC, 2022). In Study 2, respondents were randomly assigned to complete the standard question or one of two alternative question wordings that specifically referenced disparities within the United States and

racial disparities: “Do you think that climate change affects some groups *in the U.S.* more than others, or does it affect all groups *in the U.S.* about equally?” and “Do you think that climate change affects some *racial* groups more than others, or does it affect all *racial* groups about equally?” (emphasis added).

These alternative wordings were inspired by two different lines of public opinion research. First, past research suggests that those in Western and economically developed nations may readily acknowledge that climate change disproportionately impacts those living in developing countries, but less readily acknowledge disparate impacts within their own nation (Doherty & Clayton, 2011; Spence, Poortinga, & Pidgeon, 2012). Study 2 thus allowed us to test whether explicitly referencing *within-nation* disparities would produce lower rates of public recognition of climate disparities. Second, psychological research suggests that many Americans, and particularly White Americans, substantially underestimate racial disparities in many facets of life, such as the racial wealth gap (Kraus, Rucker, & Richeson, 2017; see also Onyeador et al., 2020), which, as noted above, may reflect common narratives of racial progress in U.S. society or “color-blind environmental racism,” a belief that environmental inequalities are not racialized (see Bugden, 2022; and Kraus et al., 2019). Additional survey research suggests racial attitudes and opinions (e.g., racial resentment) in the U.S. became strongly associated with opinions about climate change during the Obama Administration (Benegal, 2018). Thus, in Study 2, we tested whether explicitly referencing racial disparities would lower recognition of climate inequities, and particularly among White respondents, despite race being among the most robust determinants of climate change-related hazard exposure in the U.S. (EPA, 2021; NASEM, 2021).

We additionally explored whether recognition of climate inequities varied across select respondent demographics—specifically, age, education, race and ethnicity, and partisanship—

based on previous survey research. We examined the relationship between age and climate inequity recognition primarily to compare our results with previous surveys that measured similar beliefs among a representative sample of 18- to 36-year-olds (GenForward, 2019), a group that indicates a greater willingness to engage in climate activism relative to other segments of the public (Tyson et al. 2021). Previous research also suggests that education is associated with greater certainty that climate change is happening, especially among liberal respondents and Democrats (e.g., Hamilton, 2011), which may extend to heightened recognition of group-based climate inequities. Regarding race, recent public opinion research finds that members of racial and ethnic minority groups in the U.S. often report higher concern about climate change than U.S. Whites (Ballew et al., 2021), which may, in part, reflect heightened awareness of the disproportionate burden borne by their group (Pearson et al., 2018). Finally, we consider political partisanship given extensive evidence that Democrats express greater recognition of race-based inequities, generally (Pew, 2021), and greater certainty about climate change and more support for climate policies than do their Republican counterparts (Dunlap, McCright, & Yarosh, 2016). Specifically, we expected that Democrats would indicate greater recognition of climate inequities in general, and particularly of racial inequities, as compared to other partisan groups (see Supplementary Material for wording of demographic items).

## Results

In reporting results, we apply survey weights based on Current Population Survey benchmarks to improve the generalizability of sample results to the U.S. public. IBM's statistical package SPSS version 27 was used for all analyses. All data and study documentation will be made available through the Roper Center for Public Opinion Research at Cornell University.

*Recognition of climate inequities and the effect of question wording*

Overall, results point to markedly low recognition of climate inequities among the U.S. public, a finding that is substantially magnified when the survey question prompted respondents to consider racial disparities in climate impacts. In Study 1, with the standard question, just 37% of U.S. adults indicated that climate change impacts "some groups more than others," whereas a plurality (46%) indicated that climate change impacts "all groups about equally" and 17% said they were "not sure." We find this general lack of recognition of climate inequities to be especially notable given that the standard question wording seen by all respondents in Study 1 allows for recognizing *any* group-based disparity linked to climate change. Study 2 replicated this basic finding and revealed a significant experimental effect of question wording ($\chi 2$ (4, 1013) = 42.7, $p < .001$) (see Figure 1). Specifically, whereas 44% of respondents indicated that climate change impacts "some groups more than others" in the standard wording condition, just 22% indicated similar agreement when the question wording referenced racial differences in climate impacts. Put another way, inserting the word "racial" when asking whether climate change impacts "some groups more than others" reduced agreement *by half*. Moreover, a *majority* of respondents in the racial wording condition (57%) chose the "all (racial) groups about equally" response—the only such instance we observed (Figure 1). Finally, recognition of climate inequities among respondents who saw the "groups in the U.S." wording fell in-between the other two conditions at 39%, although the response pattern closely resembled that observed under the standard wording treatment, suggesting little differentiation in the recognition of generic and U.S.-specific inequities among our sample.

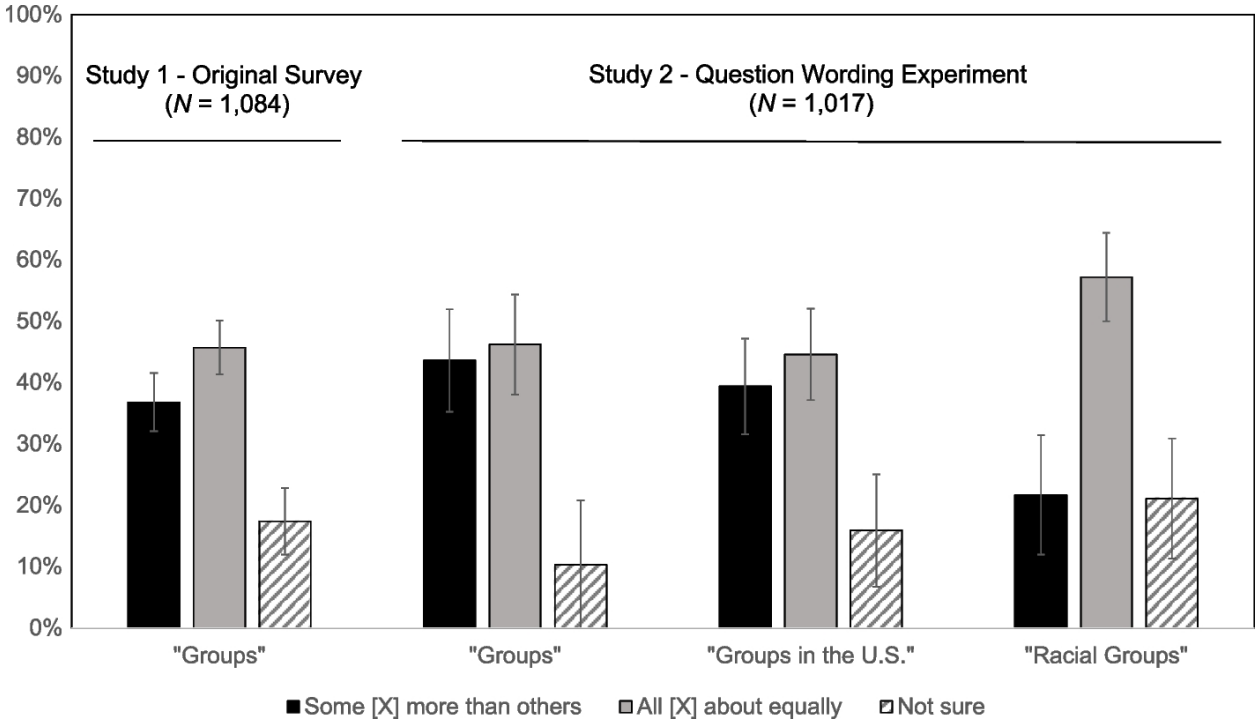


Figure 1. Weighted percentages indicating that climate change affects some groups more than others, in Study 1 (May 2022 survey) and under different question wording treatments in Study 2 (Aug/Sep 2022 question wording experiment). Error bars represent sampling margin of error at the 95% confidence threshold.

*Demographic analyses*

Recall that we expected recognition of climate inequities to vary across several key demographic variables noted above. Results suggest this was indeed the case, albeit with largely similar question wording treatment effects observed across demographic groups. Below, we summarize associations with key demographic variables in Study 1 and explore whether the question wording effect found in Study 2 varies across demographic groups (a full break down of results by demographic categories appears in Supplementary Tables 1 and 3).

*Study 1*. Results revealed greater recognition of unequal climate impacts among 18–34-year-olds, relative to all three other age categories (37% among 35–50-year-olds, 29% among 51–64-year-olds, and 34% among those aged 65 or more; $\chi 2$ (6, 1082) = 27.0, $p < .001$), with 45% of the youngest group selecting the "some groups more than others" response. We also

observed greater recognition of unequal climate impacts among those reporting higher levels of education, such that respondents with a 4-year or bachelor degree (50%) or a post-graduate degree (54%) selected "some groups more than others" at higher rates than those with a 2-year or associate degree (34%), some college but no degree (34%), high school graduate or GED (25%), and some high school or less (31%) ($\chi 2$ (10, 1082) = 67.4, $p < .001$). This pattern was driven by a greater share of "not sure" responses among those with lower educational attainment (e.g., 24% of respondents with some high school or less vs. 8% for those with a post-graduate degree). Nevertheless, baseline levels of recognition were low across all age and education categories, with a majority of the youngest age group and half of respondents with a 4-year college degree indicating that all groups are impacted about the same or that they were not sure (see Supplementary Table 1).

Due to sample size limitations, analyses examining effects of respondent race focused on the three largest U.S. Census categories: respondents identifying as White, Black or African American, and Asian or Asian American. Significant differences in recognition of climate inequities were observed across these three racial groups ($\chi 2$ (4, 1009) = 11.2, $p = .03$). Asian or Asian American respondents were the most likely to select "some groups more than others" (45%), followed by White respondents (38%) and Black or African American respondents (27%) (42% of Asian or Asian American respondents, 44% of White respondents, and 56% of Black or African American respondents selected "all groups about equally"). We also observed a significant effect of ethnicity, such that respondents identifying as Hispanic were more likely to select the "some groups more than others" response (41%) as compared to non-Hispanics (36%), with the difference partly attributable to the lower proportion of "not sure" responses among Hispanic respondents (10% vs. 19%) ($\chi 2$ (2, 1081) = 7.7, $p = .02$).

Turning to partisanship, as anticipated, Democrats were more likely to acknowledge climate inequities, with 43% selecting the "some groups more than others" response, versus 32% of Republicans and 36% of Independents ($\chi 2$ (6, 1083) = 45.5, $p < .001$); again, this pattern was partially driven by a lower proportion of Democrats (9%) selecting the "not sure" response (vs. 24% of Republicans and 21% of Independents). Nevertheless, the most common response within each partisan group, including nearly half of Democrats, was that climate change impacts "all groups about equally," chosen by 48% of Democrats, 44% of Republicans, and 43% of Independents.

Finally, we explored the relative predictive power of the above demographic variables through a binomial logistic regression model in which age, education, race, ethnicity, and partisanship were entered as predictors and recognition of climate change inequities was recoded into a dichotomous variable where "some groups more than others" was coded as 1 and "all groups about equally" and "not sure" were coded as 0. Results indicated that many of the significant relationships reported above were robust to the inclusion of the other demographic variables in the model, with the largest odds ratios observed for age (18 to 34 years old: Exp(B) = 2.07, $p < .001$, relative to 65+ years old) and partisanship (Democrats: Exp(B) = 1.87, $p < .001$, relative to Republicans). Notably, however, the previously observed effects of identifying as Hispanic (relative to non-Hispanic) and identifying as Asian or Asian American (relative to White) were no longer significant (see Supplementary Table 2 for full regression results).

*Study 2*. To what extent does the effect of question wording found in Study 2 vary across the key demographic categories? Although we note some heterogeneity in the magnitude of treatment effects, a markedly similar pattern was observed across demographic groups: For nearly every subgroup in our analysis, a substantially smaller percentage of respondents

acknowledged *racial* climate inequities, specifically, as compared to *any* climate inequities (measured by the standard question wording) (see Supplementary Table 3). Notably, this finding held among Black or African American respondents (34% in the standard wording condition vs. 21% in the racial groups condition), Asian or Asian American respondents (50% in the standard wording condition vs. 37% in the racial groups condition), and among Hispanic and non-Hispanic respondents alike (54% vs. 31% for Hispanics, and 41% vs. 20% for non-Hispanics), with a majority of respondents in all four racial-ethnic subgroups indicating climate change affects "all racial groups about equally." This pattern also held for both Democrats (49% vs. 31%) and Republicans (34% vs. 10%), younger adults (ages 18-34: 58% vs. 30%), and those with a 4-year college (47% vs. 34%) or postgraduate degree (61% vs. 29%). The only subgroup that did *not* show this pattern was respondents who identified as "some other race" (40% vs. 44%)—although the small sample size ($n$ = 24) limits inferences from this group.

## Discussion

In covering the record high temperatures recorded in Europe in the summer of 2022, a Reuters news headline reported that "'climate change affects everyone'" (Martinez, 2022). To a certain extent this is undeniable. However, as others have noted, "great equalizer" or "common threat" narratives about climate change and other global threats, such as COVID-19, have the potential to obscure the reality that these threats disproportionately impact some groups more than others—often groups that are already vulnerable due to existing social and economic inequities (Grigoriadis, 2018; IPCC, 2022; Owen et al., 2020).

In the present work, we sought to assess the U.S public's recognition of the disproportionate impacts of climate change by posing a novel survey question in two separate nationally representative surveys fielded in May and August-September of 2022. In contrast to

broad public recognition of cross-national disparities, we find evidence of substantial deficits in public recognition of the unequal climate impacts occurring within the United States. Results revealed that only a minority of the respondents recognized that climate change affects some groups more than others. Notably, asking about racial disparities in climate impacts *reduced* recognition by approximately half. Although recognition of climate inequities was greater among younger respondents, those with higher levels of education, self-identified Hispanic respondents, and Democrats, recognition was generally low across demographic groups, and the pattern of effects documented in Study 2 again showed marked consistency across demographic groups.

These results suggest that the notion that climate change affects different groups of people "about equally" remains widespread among the U.S. public, despite robust evidence to the contrary and despite extensive media coverage of societal inequities following the historic racial justice protests of 2020 and in media coverage of the differential health impacts COVID-19. Why might this be the case? In addition to pervasive narratives about racial progress in the United States, and color-blind ideology regarding environmental inequities (Budgen, 2022) that may contribute to the underestimation of inequities in other domains (e.g., the racial wealth gap; Kraus et al., 2019), our analysis offers some further insights. First, the observation that recognition of climate inequities rises with educational attainment suggests that formal education may be an important conduit for acquiring knowledge of disparate impacts of climate change that may be largely absent from other sources of climate information, such as social media and everyday climate conversations. Furthermore, that self-identified Hispanic respondents recognized climate inequities at a higher rate than non-Hispanic respondents is consistent with a sizable body of research documenting greater concern about climate change and more support for climate policies among Hispanic as compared to non-Hispanic groups in the U.S. (Benegal et

al., 2022; Pearson et al., 2021), a difference that may reflect the disproportionate burden faced by many Hispanic communities and other communities of color within the U.S. This suggests that personal experience or knowledge of broader societal inequities faced by one's group may also shape recognition of climate inequities. Nevertheless, we note this account is only partially consistent with our findings, as recognition of climate inequities in the standard wording condition was lower among respondents identifying as Black or African American, as compared to White respondents, and largely equivalent among Black and White respondents (21% and 20%, respectively) in the "racial groups" wording condition, despite the substantially disproportionate exposure burden experienced by Black and African American communities (Bullard, 1993; Tessum et al., 2019).

Future research might explore whether recognition of climate inequities varies across different types of climate hazards, including for hazards that have historically garnered more extensive media coverage of racial, economic, or other societal disparities, such as the impacts of hurricanes and coastal flooding on low-income communities of color—and particularly among disproportionately affected groups. For instance, 71% of Black Americans attributed the disproportionate impact of Hurricane Katrina on Black communities to racial inequality compared to only 32% of White Americans (Doherty, 2015). Additional studies might also assess whether endorsement of colorblind ideology (Bugden, 2022) or negative racial attitudes (see Benegal, 2018; and Dietz et al., 2018) might similarly contribute to low public recognition of racial inequities in climate impacts.

Finally, that recognition of climate inequities was higher among Democrats relative to other partisan groups suggests that political polarization around climate change – perhaps not surprisingly – also extends to recognition of its unequal effects, and particularly racial inequities.

Nevertheless, the finding that less than one third of Democrats, Republicans, and Independents recognized racial disparities in climate impacts presents a substantial challenge to efforts to build bipartisan consensus to address these disparities. Future research may benefit from examining factors that bolster recognition of climate inequities, and particularly racial inequities, across partisan groups—for example, by assessing whether personal experiences with extreme weather, media exposure, or understanding of systemic inequities and their root causes within society more generally, influence recognition of climate-related inequities (Carmichael & Brulle, 2018; Myers et al., 2013).

We note some limitations of this work. Although the more general wording of our standard question had the advantage of capturing recognition of *any* group-based inequities, it is possible that we would have observed higher recognition of climate inequities had we asked about other specific groups beyond those featured in the survey experiment in Study 2 (i.e., "groups in the U.S.," "racial groups"). For example, as mentioned above, one group-based inequity that Americans do seem to recognize is the severe impact climate change is having on developing nations. In one national survey, 54% said that climate change would cause "a great deal" of harm to "people in poorer developing countries," while just 33% said it would cause the same level of harm to "people in the United States" (PRRI, 2014). Similarly, referencing different socioeconomic groups, or groups that may make specific vulnerabilities more salient (e.g., elderly people, people with chronic health conditions) may also produce different findings from those documented here. In addition, although our survey sample was constructed to be representative of the U.S. public, that a portion of the sample was recruited using online opt-in methods may mean that caution is warranted in generalizing these results. At the same time, we note that hybrid approaches that include a mix of both probability and non-probability (opt-in)

samples—like the approach we take here—have been shown in some cases to produce more accurate results than surveys relying exclusively on probability-based methods (e.g., Enns & Rothschild, 2021). We also note that future work would benefit from incorporating additional variables that were not included on the surveys reported here, such as direct exposure to environmental hazards, which may shape awareness of inequities across groups (Schuldt et al., 2022).

In sum, our results point to a widely-shared view among many different segments of the U.S. public – including a plurality of Democrats and Republicans – that the threat of climate change is largely equal across groups, including among racial groups, despite race being a robust population-level predictor of climate vulnerability. We believe that this lay belief carries important practical implications. As the U.S. and other nations seek to address climate inequities through policies that direct resources to socially and economically marginalized and disadvantaged communities most affected by climate change, a sizable portion of the public may resist such policies. This may help to explain why just 52% of Americans support policies that would direct federal funding to combat racial inequities in environmental harm (Bugden, 2022). Without a greater understanding of public perceptions of climate inequities, and of the factors that shape these perceptions, such policies may face an uphill battle from the start.

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**Data Availability**
All data and study documentation will be made available through the Roper Center for Public Opinion Research at Cornell University.

# Supplementary Material

## Public recognition of climate change inequities within the United States

The following demographic items were provided by Verasight as part of their standard demographic profile):

*Age.* Respondents were asked to "Please enter your age in years." For analytic purposes, age was recoded into the following four categories: 18-34 years, 35-50 years, 51-64 years, and 65 years or above.

*Education*. Respondents were asked, "What is the highest level of school you have completed?," with the response options being "Some high school or less," "High school graduate or GED," "Some college, no degree," "2-year or associate degree," "4-year or bachelor degree," and "Post-graduate degree."

*Race*. To measure racial self-identification, respondents were asked, "Which of these best describes your race?," with the response options being "Black or African American," "Asian or Asian American," "Pacific Islander," "White," "Native American or American Indian," "Mixed race," and "Some other race."

*Ethnicity*. To measure self-identification as Hispanic or Latino, respondents were asked, "Are you of Hispanic or Latino origin or background?".

*Partisanship*. Political party identification was measured with the item, "Generally speaking, do you think of yourself as a(n):" with the response options being "Democrat," "Republican," "Independent," and "Other or none."

Supplementary Table 1. Recognition of climate inequities in Study 1, by key demographics

| | | Do you think that climate change affects some groups more than others, or does it affect all groups about equally? | | |
|---|---|---|---|---|
| | | Some groups more than others | All groups about equally | Not sure |
| Age | 18 to 34 | 45% | 45% | 10% |
| | 35 to 50 | 37% | 43% | 20% |
| | 51 to 64 | 29% | 51% | 19% |
| | 65 or above | 34% | 44% | 22% |
| Education | Some HS or less | 26% | 47% | 26% |
| | HS grad or GED | 25% | 53% | 22% |
| | Some college | 34% | 46% | 20% |
| | 2-year degree | 34% | 49% | 17% |
| | 4-year degree | 50% | 38% | 12% |
| | Post-graduate degree | 54% | 38% | 8% |
| Race | Black or African Am. | 27% | 56% | 17% |
| | Asian or Asian Am. | 45% | 42% | 13% |
| | White | 38% | 44% | 18% |
| | Native Am. or Am. Indian | 46% | 36% | 18% |
| | Mixed race | 47% | 43% | 10% |
| | Some other race | 29% | 52% | 19% |
| Ethnicity | Hispanic | 41% | 49% | 10% |
| | Non-Hispanic | 36% | 45% | 19% |
| Partisanship | Democrat | 43% | 48% | 9% |
| | Republican | 32% | 44% | 24% |
| | Independent | 36% | 43% | 21% |
| | Other/none | 28% | 46% | 26% |

Supplementary Table 2. Logistic regression results

| | | B | S.E. | Wald | df | p | Exp(B) |
|---|---|---|---|---|---|---|---|
| Age | 18 to 34 | 0.728 | 0.209 | 12.17 | 1 | <0.001 | 2.071 |
| | 35 to 50 | 0.365 | 0.207 | 3.122 | 1 | 0.077 | 1.44 |
| | 51 to 64 | 0.041 | 0.211 | 0.037 | 1 | 0.847 | 1.042 |
| Education | Some HS or less | -1.142 | 0.342 | 11.143 | 1 | <0.001 | 0.319 |
| | HS grad or GED | -1.196 | 0.217 | 30.423 | 1 | <0.001 | 0.302 |
| | Some college | -0.707 | 0.231 | 9.374 | 1 | 0.002 | 0.493 |
| | 2-year degree | -0.793 | 0.301 | 6.953 | 1 | 0.008 | 0.452 |
| | 4-year degree | -0.143 | 0.224 | 0.41 | 1 | 0.522 | 0.867 |
| Race | Black or African Am. | -.740 | .216 | 11.769 | 1 | <0.001 | .477 |
| | Asian or Asian Am. | -.237 | .288 | .677 | 1 | .411 | .789 |
| Ethnicity | Hispanic | -.190 | .209 | .831 | 1 | .362 | .827 |
| Partisanship | Democrat | .625 | .174 | 12.902 | 1 | <0.001 | 1.868 |
| | Independent | .289 | .196 | 2.179 | 1 | .140 | 1.335 |
| | Other/none | -.118 | .285 | .172 | 1 | .678 | .889 |

*Note*: “Some groups more than others” was coded as 1, “all groups about the same” and “not sure” coded as 0. The referent categories are as follows: 65 or above (age), post-graduate degree (education), White (race), non-Hispanic (ethnicity), Republican (partisanship).

Supplementary Table 3. Recognition of climate inequities in Study 2, by question wording and key demographics

| | | Do you think that climate change affects… | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Some **groups** more than others | All **groups** about equally | Not sure | Some **groups in the U.S.** more than others | All **groups in the U.S.** about equally | Not sure | Some **racial groups** more than others | All **racial groups** about equally | Not sure |
| Age | 18 to 34 | 58% | 39% | 3% | 49% | 44% | 7% | 30% | 52% | 18% |
| | 35 to 50 | 35% | 48% | 17% | 39% | 37% | 24% | 22% | 51% | 27% |
| | 51 to 64 | 47% | 46% | 7% | 34% | 41% | 24% | 21% | 61% | 18% |
| | 65 or above | 31% | 55% | 14% | 31% | 60% | 9% | 14% | 65% | 21% |
| Education | Some HS or less | 13% | 38% | 50% | 42% | 32% | 26% | 0% | 30% | 70% |
| | HS grad or GED | 35% | 50% | 15% | 32% | 42% | 26% | 16% | 64% | 21% |
| | Some college | 38% | 53% | 9% | 46% | 34% | 20% | 15% | 59% | 26% |
| | 2-year degree | 65% | 30% | 4% | 33% | 58% | 8% | 31% | 50% | 19% |
| | 4-year degree | 47% | 47% | 6% | 42% | 47% | 10% | 34% | 51% | 15% |
| | Post-graduate degree | 61% | 37% | 2% | 48% | 51% | 2% | 29% | 59% | 12% |
| Race | Black or African Am. | 34% | 49% | 17% | 36% | 45% | 19% | 21% | 58% | 21% |
| | Pacific Islander | 100% | 0% | 0% | - | - | - | 100% | 0% | 0% |
| | Asian or Asian Am. | 50% | 50% | 0% | 57% | 43% | 0% | 37% | 63% | 0% |
| | White | 45% | 46% | 9% | 38% | 45% | 17% | 20% | 57% | 24% |
| | Native Am. or Am. Indian | 0% | 100% | 0% | 57% | 29% | 14% | 0% | 100% | 0% |
| | Mixed race | 75% | 25% | 0% | 25% | 38% | 38% | 27% | 55% | 18% |
| | Some other race | 40% | 33% | 27% | 57% | 43% | 0% | 44% | 33% | 22% |
| Ethnicity | Hispanic | 54% | 42% | 3% | 50% | 38% | 13% | 31% | 53% | 16% |
| | Non-Hispanic | 41% | 47% | 12% | 38% | 46% | 17% | 20% | 58% | 22% |
| Partisanship | Democrat | 49% | 47% | 4% | 50% | 44% | 6% | 31% | 52% | 17% |
| | Republican | 34% | 51% | 15% | 33% | 42% | 25% | 10% | 67% | 23% |
| | Independent | 42% | 46% | 13% | 35% | 51% | 15% | 27% | 49% | 24% |
| | Other/none | 50% | 23% | 27% | 33% | 44% | 23% | 12% | 62% | 27% |