

Identity, Industry, and Perceptions of Climate Futures

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Climate change and decarbonization will impose costs on a range of industries, but in ways that are difficult to predict. I argue that the racial makeup of an industry serves as a heuristic by which communities evaluate its viability in contexts of deep uncertainty. In surveys of diverse samples of the US public, I randomize the racial compositions of hypothetical industry workforces. I find that individuals are more pessimistic about industries that draw workers from marginalized racial groups, expecting those industries to be denied government support as climate-related stressors manifest. Individuals are more confident in industries tied to privileged groups, believing politicians will more readily come to their aid when called upon. These findings illustrate how racial divisions shape mass climate politics and suggest that group hierarchies serve as a touchstone for evaluating economic risk in uncertain settings.

Climate change is an issue rife with economic risk. Efforts to arrest the pace of global warming threaten the viability of industries reliant upon fossil fuels. Levels of warming locked in by past emissions endanger industries vulnerable to the physical impacts of climate change. Yet while such disruptions have become increasingly likely, they are marked by “extremely large” uncertainties around their timing, breadth, and intensity (Chenet, Ryan-Collins, and van Lerven 2021; Nordhaus 2017, 1522). Decarbonization, dependent on policy changes and technological advances, implies an unprecedented transformation of the carbon-based global economy, which complicates attempts to calculate industries’ risk of decline or obsolescence. Future physical climate damages are similarly subject to unforeseen policy choices, demographic and economic shifts, and unknowns around the Earth’s climate sensitivity. Governments’ ability to protect all industries is moreover constrained: propping up dirty industries endangers vulnerable industries, whereas decarbonizing in aid of vulnerable industries necessarily imperils the fossil fuel-reliant industries (Colgan, Green, and Hale 2021; Gaikwad, Genovese, and Tingley 2022).

How do individuals make sense of economic futures amid such complexities and uncertainties? To answer these questions, I develop a theory that emphasizes identity as an important and heretofore underappreciated determinant of political contestation around climate change. Political economists have long tied risk perceptions to objective economic criteria, such as skill profiles, the experience of economic shocks, or competition with foreign producers (Iversen and Soskice 2001; Rogowski 1987). I instead argue that ascriptive attributes of industries, namely, their ethnoracial makeups, are used as a subjective heuristic for estimating their ability to avoid decline. Racial and ethnic groups often concentrate in distinct industries, which publics are attentive to (Baccini and Weymouth 2021; Jha 2013; Zucker 2022).¹ Industries seen as tied to politically favored groups are thought to have unique access to government backstops, allowing them to avoid decline as decarbonization accelerates and physical climate impacts intensify. Conversely, connection to marginalized groups casts doubt on an industry’s prospects, with it believed to have fewer benefactors in government. Identity-based features of industries, alongside prior beliefs about group favoritism in government,

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1. My use of the term “ethnoracial” acknowledges the extent to which racial and ethnic divides are overlaid, following prior scholarship (e.g., Grumbach and Sahn 2020). Note that perceptions of industries’ ethnoracial composition need not be accurate. Baccini and Weymouth (2021) document how many Americans see the decline of manufacturing as undermining the white working class, despite it in fact imposing heavier costs on minority communities.

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thus help resolve—accurately or not—the uncertainties that surround the futures of climate change and decarbonization.

A prevailing approach in the climate politics literature has been to ask why states do more or less to abate climate change. This work explores why the international community has struggled to conclude ambitious climate pacts and identified factors that may make climate cooperation more appealing and effective (Bechtel and Scheve 2013; Finnegan 2022; Tingley and Tomz 2014; Victor 2011). In this article, by shifting focus to risks generated by future decarbonization and physical climate damages,² I probe the consequences of this gridlock: how publics see and cope with failures to facilitate orderly transitions away from fossil fuels and limit the physical damages of climate change. In doing so, I evaluate how mass attitudes form around the “existential” contest for government protection between “climate-vulnerable” industries exposed to those physical damages and the “climate-forcing” industries threatened by decarbonization (Colgan et al. 2021; also see Aklin and Mildenberger 2020; Bayer and Genovese 2020; Kennard 2020).³ This sheds light on a choice of mounting importance to workers and communities: whether to exit and lessen reliance on industries threatened by decarbonization or climate change or remain in place and gamble on their continued ability to support livelihoods (Gazmararian and Tingley 2023).

To test whether ascriptive features of industries can shift risk attitudes, I conduct experiments embedded in surveys of diverse samples of the US public. Results show that the racial makeup of workforces affects risk perceptions. Americans who believe the government favors white citizens see greater risk to industries that employ large numbers of Black workers, expecting these industries to have more difficulty accessing support as decarbonization accelerates and physical climate impacts intensify.⁴ These subjects reported, for example, that a white-majority fossil fuel-reliant industry would be more than twice as likely as a hypothetical Black-majority climate-vulnerable industry to win subsidies. On the other hand,

Americans who believe that minorities are politically favored see greater risk to workers in white-majority industries, expecting the government to, in the words of one respondent, “pander” to Black-majority workforces. Such attitudes are apparent among both Democrats and Republicans and across economic classes and racial groups.

These findings advance the literatures on climate change and the intersection of risk and identity. Scholars are increasingly approaching climate change not just as a matter of global collective action but as a problem of industrial viability, acknowledging the high likelihood of carbon-intensive (climate-forcing) and climate-vulnerable assets being devalued by decarbonization and continued global warming (Aklin and Mildenberger 2020; Green et al. 2022). This new framing reflects the growing attention among policymakers to climate-related economic risks (Clark and Zucker 2024). There is a wealth of public opinion research on climate change (e.g., Egan and Mullin 2017). But we have little sense of how electorates perceive and mobilize around the industrial disruptions threatened by climate change and decarbonization, nor the contest for government aid between industries responsible for and vulnerable to climate change (Colgan et al. 2021).⁵ Moreover, there has been limited grappling with the uncertainties of climate change, decarbonization, and the global economy generally—the complexities that inhibit objective calculations of economic risk (Katzenstein 2022; Keynes 1921; Knight 1921).

This article illustrates how race molds perceptions of economic futures amid such uncertainties. In doing so, I introduce identity conflict as an important determinant of the contours of mass climate politics, highlighting how communities may lean on prior beliefs around political privilege and exclusion in attempting to make sense of deeply uncertain issues. The argument I lay out illustrates how failures of international cooperation, such as those that have allowed global warming to accelerate, are differentially interpreted according to where individuals place themselves in domestic political orders (Gourevitch 1978).

This article focuses on the case of race in the United States. However, the argument should extend to other settings where climate-related risks are overlaid on highly salient ethnoracial divides. Real and perceived patterns of ethnoracial favoritism in government policymaking are present across many polities (McClendon 2016; White 2007). Moreover, ethnoracial groups

2. “Transition risks” are those generated by future decarbonization, threatening fossil fuel-reliant and other climate-forcing industries. Stranded assets may result, for example, if rapid government policy shifts render crude oil production infrastructure unusable. “Physical risks” emerge from failures to adequately decarbonize and avert the physical impacts of climate change, such as drought and sea level rise. These risks are particularly pronounced for climate-vulnerable industries such as drought-prone agriculture.

3. Climate-vulnerable and climate-forcing industries are ideal types. I define the former as industries predominantly invested in assets susceptible to devaluation due to physical climate impacts. I define the latter as those predominantly invested in assets susceptible to devaluation due to decarbonization. See Colgan et al. (2021) on asset revaluation.

4. Government subsidies have historically targeted white communities (Katznelson 2005).

5. Existing discussions of climate risks often focus on the all-encompassing impacts of climate change, not dangers to specific industries. Surveys conducted by the Yale Program on Climate Change ask, e.g., “how much do you think global warming will harm people in developing countries?” (<https://climatecommunication.yale.edu/visualizations-data/ycom-us-2024/>).

often disproportionately concentrate in certain industries, lending local workforces distinct and observable ascriptive characteristics (Jha 2013; Reich, Gordon, and Edwards 1973; Zucker 2022). The argument is less applicable where ethnoracial divides are not a dominant political cleavage and where the public accordingly does not see those divides as a plausible determinant of government policy—features that may be more likely, for example, under proportional representation electoral rules, in countries with less economic inequality, or in polities with small minority populations (Huber 2012, 2017; Posner 2004). It is likewise less applicable in labor markets exhibiting less ethnoracial segmentation, where groups do not clearly cluster in separate industries. The argument may extend to other issue areas, though climate is unique in the breadth and depth of “unprecedented existential and temporal uncertainty” that attends it (Hamilton 2019, 610; on the unique uncertainties of climate change and decarbonization, also see Chen et al. 2021; Colgan and Hinthorn 2023; Constantino and Weber 2021).⁶

This article further advances the broader literature on industrial decline and identity. Recent work finds that realizations of economic risks, such as deindustrialization and job loss, deepen identity cleavages (Ballard-Rosa, Jensen, and Scheve 2022). The *ex post* observation of coethnics losing work stokes fears of economic precarity and political displacement (Baccini and Weymouth 2021; Zucker 2022). This article shifts our focus to yet-to-be-realized risks, such as those stemming from future climate change. My findings here suggest that even prior to actual job losses, the concentration of in-group members in certain industries can shape views of their long-run viability, perceptions of workers’ job security, and voters’ propensity to pursue government protection.

The article lastly answers calls to better incorporate race into international and comparative political economy scholarship (Zvobgo and Loken 2020), describing how ingrained beliefs about racial hierarchies shape how communities perceive and prepare for economic disruption. This speaks to the literature on race and economic insecurity, including work highlighting how persistent racial wealth gaps complicate efforts by minorities to manage economic risks (Ganong et al. 2020). The findings in this article indicate that such communities may be particularly attuned to issues of political marginalization when developing views of economic risks and uniquely wary of the ability of in-group workers to call on the state for support as such risks manifest.

6. Precedents for globalization-induced shocks, for example, might be more readily available in communities with histories of trade-related economic dislocations.

UNCERTAINTY, IDENTITY, AND THE EVALUATION OF ECONOMIC RISK

Scholars traditionally model economic risk perceptions as functions of objective material conditions. Classic work on welfare states ties increased social spending to labor’s observation of volatility stemming from globalization or deindustrialization (Iversen and Cusack 2000; Rodrik 1998). Workers with less transferrable skills seek government protections to hedge against unemployment (Iversen and Soskice 2001). Studies of trade and immigration tie individual preferences to personal skill profiles and nationwide factor abundancies (Mayda 2006; Scheve and Slaughter 2001). Yet there is growing appreciation for the subjectivity of risk assessments. Investors lean on cognitive shortcuts when assessing sovereigns’ creditworthiness (Brooks, Cunha, and Mosley 2015). Social emulation, as opposed to objective analysis, fed dangerous risk taking by financial institutions ahead of the 2008 financial crisis (Nelson and Katzenstein 2014).

The complexities and uncertainties that mark decarbonization and climate change impede estimation of risk. The phasing out of fossil fuels and broad environmental consequences of climate change imply “dramatic transformations in the underlying economic structure” that complicate efforts to calculate an industry’s likelihood of decline (Nelson and Katzenstein 2014, 362, on sources of economic uncertainty). Decarbonization will be governed by yet-to-be-seen policy choices, as well as socioeconomic trends and technological advances that will determine the world’s eventual energy consumption and may render fossil fuels obsolete.⁷ Although fossil fuel-reliant, climate-forcing industries are uniquely susceptible to the energy transition, they may be able to creatively adapt or intervene in policymaking to remain afloat as “transition risks” materialize (Kennard 2020). The course of climate change will similarly be shaped by future policy choices, socioeconomic scenarios that lack clear precedents, and the intricacies of the Earth’s physical climate system. Although it is assured that global warming will continue for at least the next several years (IPCC 2021), the physical implications of that for single industries are less apparent—uncertainties over potential physical climate damages, or “physical risks,” mount at fine geographic and temporal scales (Sobel 2021). In some cases, climate-related disasters may render some local industries unviable in the short term; in other cases, long-term processes such as ocean acidification may gradually harm industries such as fishing. These syndromes of “radical” uncertainty prevent economic agents

7. Decarbonization-related dislocations may occur gradually or abruptly. Ambiguity around “the speed of the global energy transition” is a source of uncertainty (Colgan and Hinthorn 2023, 10).

“from having the deterministic or probabilistic vision of the future that they are looking for” in an era of climate dislocation (Chenet et al. 2021, 6).⁸

In light of this deep uncertainty, how do communities evaluate the future viability of climate-forcing and climate-vulnerable industries and assess the security of workers within those industries? I argue that one means of doing so is to guess the intentions of the government: whether the government will come to the aid of a climate-forcing industry struggling under the weight of decarbonization or a climate-vulnerable industry battling mounting climate damages. Industries with greater access to state subsidies should be seen as better positioned to avoid decline as those risks materialize.

Scholars have identified a number of determinants of industry access to government protection. These include campaign contributions, connections to lawmakers, asymmetric levels of expertise, political institutions, and electoral geography (Betz and Pond 2023; Grossman and Helpman 1994; Rickard 2018; Stokes 2020). Although all such claims have strong theoretical and empirical bases, such dictates of industry access to the state are likely obscure to broad swathes of the public. Individuals may associate campaign contributions and industry size with political sway, but the magnitude of such contributions and output of different industries are often not readily apparent. Social connections between industries and individual legislators are presumably even more opaque. A country's electoral institutions and economic geography are unlikely to factor into individuals' calculus of industrial strength, as suggested by work finding that citizens tend to be poorly informed (Rho and Tomz 2017). Given the opacity of these factors, members of the public may look elsewhere for indicators of industry access to subsidies.

I argue that ethnoracial characteristics of industries serve as a heuristic for evaluating their political sway and ability to weather climate disruptions and decarbonization.⁹ Publics often observe or hold well-formed beliefs about the racial or ethnic composition of local workforces (Baccini and Weymouth 2021; Jha 2013; Zucker 2022). Prior work also shows that in divided societies, individuals are closely attuned and responsive to the ethnoracial attributes of groups under social or economic threat. The perceived racial character of people with HIV/AIDS shifted public opinion on the health

crisis, for example (Lieberman 2009). Prejudiced white Americans became more acceptant of COVID-19 risks when informed that the pandemic disproportionately affected Black Americans (Stephens-Dougan 2023). Voters in the United States have clear, if sometimes inaccurate, beliefs about the racial identities of workers in declining industries (Baccini and Weymouth 2021).

People moreover often have prior beliefs about which racial or ethnic groups can best “get ahead” in a society: which are best able to obtain favors from politicians, or which contend with political exclusion. Americans frequently have firm views about whether Black Americans are subject to structural discrimination, with such racial attitudes having been passed down across generations (Acharya, Blackwell, and Sen 2018; Goldman 2017; Kam and Burge 2018). Right-wing populists in Europe exploit fears that states are allocating more resources to immigrants than natives (Betz and Habersack 2020). Poor Muslims in parts of India attribute their low economic station to religious discrimination, amending their behavior in expectation of political and economic exclusion (Williams 2011). Expectations of favoritism drive support for coethnic politicians in Ghanaian cities (Nathan 2016).

These beliefs may be most likely to emerge in ethno-racially stratified polities, where political battles are waged along racial or ethnic lines and where certain groups are consistently favored by the state (Huber 2017; Huber and Suryanarayan 2016). In these contexts of group stratification, beliefs about ascriptive criteria for economic and political advancement take root owing to personal experiences of state-sanctioned discrimination or perceived deprivation (Oskooii 2020), media and elite messaging (Wasow 2020), the formal institutionalization of group categories (e.g., via apartheid, Lieberman and Singh 2012), and the transmission of norms and attitudes from parents to children (Acharya et al. 2018). Of course, beliefs about group hierarchies are not uniform where ethnoracial favoritism is apparent; favored groups often fear transformation of the status quo order (Blumer 1958; Bobo 1999) and see their political power as restricted or imperiled (Oliver and Mendelberg 2000). In these settings, marginalized communities and “sympathetic” members of privileged groups may exhibit the strongest beliefs that certain groups will continue to be favored into the future.¹⁰

Prior beliefs about group privilege should help individuals make sense of economic risks amid uncertainty.¹¹ Scholars

8. This discussion follows from the distinction between a world of risk and one of uncertainty (Keynes 1921; Knight 1921). In a world of risk, asset values can be modeled as probability distribution functions. In a world of uncertainty, probabilities cannot be reliably modeled; “the future is unknowable and unpredictable” (Chenet et al. 2021, 4).

9. In this respect, uncertainty lies more with the timing, site, and magnitude of climate and decarbonization-related disruption than future government policy.

10. See Chudy (2021) on sympathy for outgroups.

11. This heuristic may be less operative where group hierarchies and patterns of political privilege are volatile, reducing certainty over long-run patterns of government favoritism.

argue that people refer to social conventions to impose order in uncertain settings (Nelson and Katzenstein 2014). As Constantino and Weber (2021) contend, under deep climate uncertainty, “people rely on heuristics and social cues to guide their decisions, [as well as] cultural artifacts and narratives to make sense of the world” (152). Perceived ethnoracial criteria for economic and political advancement may serve as one such ordering principle. The presence of a privileged group in an industry, one that satisfies those criteria, may indicate that that industry will enjoy easy access to government backstops. The presence of a marginalized group, one that fails to meet such criteria, should conversely cast doubt on that industry’s political support. The use of ascriptive information as an indicator of political access may lead to incorrect conclusions about government intentions—several other factors determine subsidy allocation, as noted above.¹² But it nonetheless may be a way by which individuals resolve uncertainties around the trajectories of at-risk industries.¹³ This argument is in line with work finding that, in racially divided polities, many people focus on the racial character or perceived racial intent of public spending (Gilens 1996). It moreover reflects how voters often perceive a link between the maintenance of status quo racial hierarchies and the survival of specific industries (Baccini and Weymouth 2021).

It is accordingly plausible that publics will see biased patterns of public spending and industrial policymaking as a consequence of ethnoracial favoritism in government. When climate-forcing industries are associated with subjectively privileged groups, concerns around decarbonization-related risks to those industries should be diminished.¹⁴ Although the specter of decarbonization may loom over such industries, the presence of favored groups suggests that the government will safeguard the industries and their workforces—subsidizing fossil fuel production and consumption, resisting costly emissions reduction policies. Correspondingly, concern for the future of climate-vulnerable industries may mount if they feature relatively more marginalized workforces. On the other

hand, if subjectively advantaged groups are tied to those climate-vulnerable industries, such fears may subside. This leads to the following hypothesis.

H1. The concentration of subjectively privileged ethnoracial groups in an industry should attenuate concerns around transition and physical risks to that industry.

RISK AND RACE IN THE UNITED STATES

In countries such as the United States, ethnorace is plausibly a distinguishing characteristic of at-risk industries and an influential determinant of perceived industry access to state support. In contemporary American politics, race remains a dominant axis of political polarization (Hutchings 2009). Americans have long viewed government spending through the lens of race: white Americans, for example, traditionally associate welfare with spending on minorities (Gilens 1996). Both minority and white communities are known to be attuned to real or imagined threats to their group (Jardina 2019; White, Laird, and Allen 2014). Shifts in political efficacy, the perceived ability to effectively participate in politics, are known to affect rates of political mobilization along racial lines (Merolla, Sellers, and Fowler 2013; West 2017). Race is thus a likely heuristic for assessing economic conditions, particularly where ethnoracial groups segment into distinct industries.

Risks from the energy transition and physical climate impacts have distinct racial characters in the United States. On the side of transition risks, industries like coal have become public symbols of white identity in some corners of national politics (Earle 2017). The whiteness of oil and gas workforces has attracted national media attention (Brady 2017; Elliott 2020; Harder 2020). Figure 1 illustrates how non-Hispanic white Americans tend to disproportionately cluster in such heavy-emitting, climate-forcing industries. Eighty-three percent of counties featured disproportionately white climate-forcing industries in 2019, where the white share of climate-forcing workers exceeded the white share of all county workers. In Texas, the climate-forcing workforce was 10.5 percentage points more white than the state’s overall workforce (see app. A for workforce shares by state). Non-white Americans, conversely, rarely work in such industries at high rates; 90% of counties featured disproportionately low shares of Black climate-forcing workers in 2019.

On the side of physical risks, minorities are uniquely exposed to the impacts of unmitigated climate change (EPA 2021). Historically “redlined” neighborhoods, largely populated by people of color, are prone to flooding from rising sea levels (Katz 2021). Minority communities often struggle to access government funds after natural disasters, including

12. I do not claim that this heuristic is wholly determinative of risk perceptions. Nonascriptive industry-specific characteristics may affect baseline perceptions of government intentions. For example, some people may believe that fossil fuel industries are distinctly powerful because of the amount of money spent lobbying politicians. Connection of those industries to privileged groups would then compound prior expectations that they are set to win government support.

13. Perceptions of industry influence may engender real shifts in industry power. If workers in a subjectively privileged industry invest more in political mobilization, they may augment their industry’s political sway and access to state support (see Alt and Gilligan 1994).

14. “Subjectively privileged” is meant to reflect the variation in beliefs about group privilege.

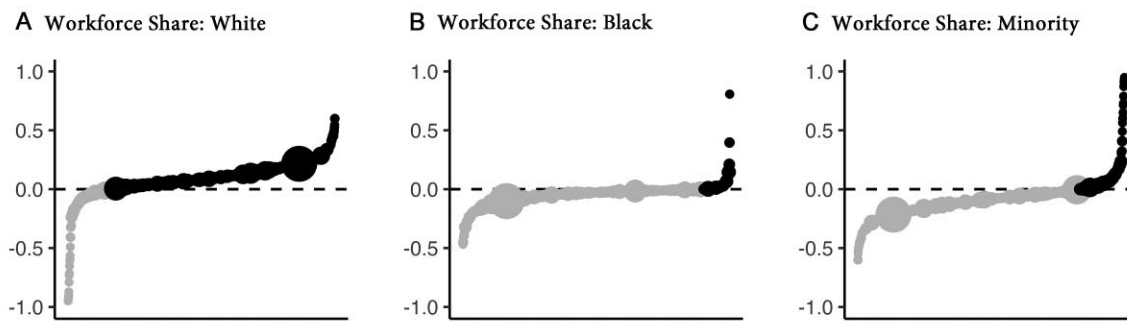


Figure 1. (A) White (non-Hispanic), (B) Black, and (C) aggregate minority (nonwhite and/or Hispanic) shares of county-level mining, quarrying, and oil and gas extraction workforces, relative to shares of overall county workforces. Plotted in ascending order; colored black if above zero (more than overall workforce share) and gray if at or below zero. Points scaled to total number of workers in county by race. Data from the US Census Bureau Quarterly Workforce Indicators for 2019Q4.

climate change–fueled events like hurricanes, an issue accentuated by a lack of shock-absorbing wealth (Flavelle 2021; also see Ganong et al. 2020). Climate-vulnerable industries are notably less skewed toward white individuals than climate-forcing industries. Figure 2 shows that just 56% of counties have disproportionately white climate-vulnerable workforces (defined here as agriculture, forestry, fishing, and hunting), far less than the number with unusually white climate-forcing workforces.¹⁵ California, with its large agricultural sector, features a climate-vulnerable workforce nearly 10 percentage points less white than its overall workforce (app. A). These larger shares of minorities in climate-vulnerable lines of work have attracted attention from the media and politicians.¹⁶ Climate-vulnerable industries are markedly less white than their climate-forcing counterparts.

Views of racial privilege vary widely. Belief that whites are politically advantaged should lead many Americans to see less risk of decline in whiter industries. This thinking is likely to be prevalent among minorities and white citizens who exhibit “racial sympathy” or “distress over black misfortune” (Chudy 2021, 122). For minorities, individual and historical experiences of discrimination—in labor markets, elections, and other interactions with the state (Bertrand and Mullainathan 2004; White 2019)—may sow doubt as to the government’s willingness to intervene in the economy to protect minority workers. The history of white favoritism in US government spending may compound this skepticism (Katznelson 2005, 2013).

15. Black workers in these industries have historically struggled to access subsidies (Reiley 2021).

16. A recent media report highlighted that “people of color are . . . disproportionately exposed to extreme heat through their occupations” (Alfonseca and Grant 2022). Another noted, “people of color, who are disproportionately represented in outdoor occupations, stand to be hit especially hard” by climate change (McDaniel 2021). Also see Congressional Hispanic Caucus (2021).

In contrast, fears of white displacement or an upset racial hierarchy should prompt the opposite response to climate-related risks (see Baccini and Weymouth 2021). Among those skeptical of the political advantages of white Americans, less white workforces may instead be seen as most secure. Although this tendency may be most pronounced among white Americans actively hostile toward minorities, it is likely to also be apparent among the many white individuals who, fearing status loss or growth in minority communities, express solidarity with their racial in-group (Jardina 2019).

Alongside race, class divisions are also prominent. Although I focus empirically on race, I do not deny the importance of class grievances; race and class cleavages are tightly interwoven (Huber 2017; Suryanarayan and White 2021). But the racial compositions of workforces exposed to decarbonization and climate change vary widely, more so than their class makeups, making race a potentially powerful separating indicator of industries’ power and cue for people contemplating an industry’s viability.¹⁷

By shaping views of industry access to public subsidies, perceived racial biases in government should shift the weight Americans place on risks to climate-vulnerable industries versus those risks to climate-forcing industries. In situations where subjectively privileged groups concentrate more in climate-forcing industries than in climate-vulnerable industries, Americans should be more pessimistic about the future of the latter. When subjectively marginalized groups concentrate in climate-forcing industries, conversely, concerns about disruptive decarbonization should mount.

EXPERIMENTAL ANALYSIS

To illuminate the structure of mass risk attitudes, I conducted preregistered online surveys of diverse samples of the

17. Social identities also often supersede class loyalties, even in settings with yawning economic inequities (Huber 2017; Mutz 2018).

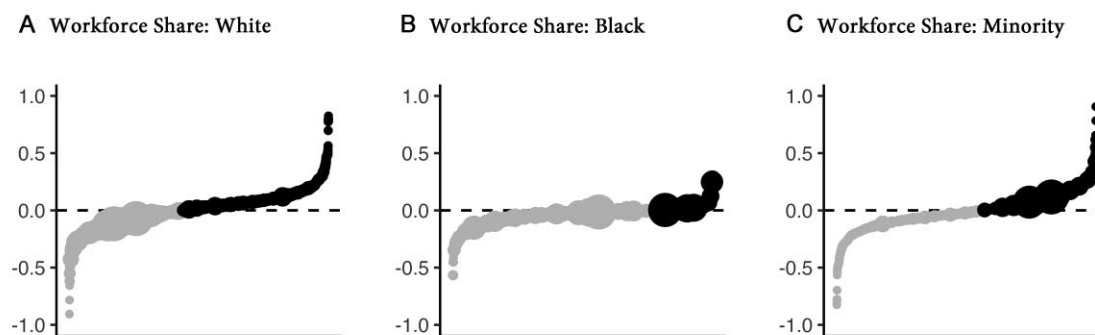


Figure 2. (A) White (non-Hispanic), (B) Black, and (C) aggregate minority (nonwhite and/or Hispanic) shares of county-level agriculture, forestry, fishing, and hunting workforces, relative to shares of overall county workforces. Plotted in ascending order; colored black if above zero (more than overall workforce share) and gray if at or below zero. Points scaled to total number of workers in county by race. Data from the US Census Bureau Quarterly Workforce Indicators for 2019Q4.

US adult population. Subjects were recruited via Lucid Theorem, which supplies samples to match US census quotas along the dimensions of age, gender, race, and region. These samples have been shown to be appropriate for political science theory testing, with potentially greater external validity than convenience samples recruited via services like Amazon Mechanical Turk (Coppock and McClellan 2019). Surveys were conducted in August 2021, yielding 1,604 responses.¹⁸ Appendices B and C provide sample details and the survey content.

To test whether racial divides shape perceptions of transition and physical risks, experiments embedded in these surveys randomize the racial makeups of hypothetical climate-forcing and climate-vulnerable workforces. Prior to the experimental modules, the survey presented subjects with a description of risks to climate-forcing and climate-vulnerable industries, indicating that realizations of these risks could cause industries to lose money and lay off workers. The vignette noted that government subsidies could protect industries from such risks.

Subjects were then shown a pair of hypothetical industries, one labeled “fossil fuel–reliant” and the other “climate-vulnerable,” along with example industries for each.¹⁹ One-

third of respondents received no additional information; this group is used to describe the general contours of public opinion around physical and transition risks (conditional on having received the aforementioned vignette describing such risks). Two-thirds of respondents were shown information on the racial balance of the two industries. Half of these subjects were told that the climate-forcing industry had “mostly White workers” and the climate-vulnerable industry “mostly Black workers”; the other half were shown the opposite. Although minority-majority climate-forcing workforces are rare in the United States (fig. 1), Americans often hold exaggerated views of workforces’ racial composition (Baccini and Weymouth 2021) and overestimate the size of minority population shares (Orth 2022).²⁰

The experimental analyses compare these two treatment groups with each other, identifying the causal effect of shifting the balance of white and Black workers between climate-forcing and climate-vulnerable industries.²¹ Although other ethnic minorities may cluster in climate-forcing and climate-vulnerable industries, I focus on the distinction between white and Black given the unique historical significance and salience of that cleavage.

This experimental design is relatively abstract. I opt for this streamlined approach to precisely test whether racial features of industries affect risk perceptions. As argued in a recent piece on experimental abstraction, “if the purpose [of the study] is to demonstrate that an effect exists, a sparser

18. Piloting was conducted June 20–28, 2021; the full survey was conducted August 4–14, 2021. Although these surveys were fielded during the COVID-19 pandemic, the results of in-pandemic surveys largely match those of prepandemic surveys (Peyton, Huber, and Coppock 2022). Of the 1,604 responses obtained, 374 (23%) failed an attention check. Subjects who completed the survey in less than 30 seconds (1.6% of sample) are excluded, as described in the preregistration (app. V). Results are robust to excluding those who failed the attention check.

19. Subjects were told “fossil fuel–reliant” instead of “climate-forcing” to ease comprehension. Examples of fossil fuel–reliant industries given were “oil and gas, coal, heavy manufacturing.” Examples of climate-vulnerable industries given were “agriculture, fishing, coastal industries.”

These industry classifications are ideal types; agriculture, for example, is a carbon emitter but is often highly climate vulnerable.

20. A milder treatment (e.g., one noting that a given workforce is merely disproportionately Black) would likely attenuate effect magnitudes; effect directions would presumably remain consistent.

21. Comparing these treatment groups with the group that received no race information would risk conflating the effects of racial primes with the effects of the industries’ racial compositions.

experimental design better enables researchers to identify it” (Brutger et al. 2023, 981). Rich evidence also demonstrates that individuals are attuned to industries’ ethnoracial makeup outside of hypothetical experimental confines (Baccini and Weymouth 2021; Jha 2013; Zucker 2022).²²

After being shown the pair of hypothetical industries, subjects were asked to indicate the likelihood of each industry declining over the next decade on a five-point scale. Subjects were also asked about which industry they saw as likelier to receive government subsidies in the next decade.²³ They then elaborated on their answers in short written responses. This experimental module blocked on race: treatments were randomized within the subsets of non-Hispanic white subjects and minority (Hispanic and/or nonwhite) subjects.

To further evaluate the effect of industries’ racial composition, subjects were subsequently shown a set of four hypothetical industries that randomly varied in type and racial makeup: “Think about a [climate-vulnerable/fossil fuel–reliant] industry employing mostly [White/Black] people.” For each industry permutation, subjects were asked two questions. First, “How much do you think the government would help people in this industry keep their jobs?”²⁴ Second, subjects were told, “Suppose you worked in this industry. If you were to call your Senator or Congressperson asking that he or she help protect your job, how helpful do you think he or she would be?” Subjects answered each question along a five-point scale. I use this second experimental module to conduct within-subject analyses of the effects of shifting the type and composition of industries susceptible to climate change and decarbonization.

Nonexperimentally, subjects were asked pretreatment demographic questions and questions about their political attitudes, including some probing views of racial bias in government. The above theory implies that changing industries’ racial compositions will have heterogeneous effects according to subjects’ perceptions of group hierarchies. In analyses described below, I accordingly divide subjects into subgroups by these stated racial attitudes.

I seek to measure beliefs that government favors one racial group over another when allocating financial resources.²⁵ I measure perceptions of this bias in multiple ways. Primarily, I ask subjects to estimate how the government would allocate 10 tokens, representing some amount of money, between a white citizen, Black citizen, rich citizen, and poor citizen.²⁶ Allocations to the white citizen that exceed allocations to the Black citizen are taken to indicate belief that the government favors white people. Indicative of the racial lens through which many Americans see government spending, a plurality of respondents (both white and minority) allocated more tokens to the white citizen than the rich citizen. In supplementary tests, I examine responses to other questions about whether the governments caters to white citizens more or less than Black citizens (app. C).

Survey results indicate that many Americans lack strong views about the future viability of climate-forcing and climate-vulnerable industries. Approximately 26% of subjects reported that a climate-forcing industry is “neither likely nor unlikely” to decline in the next 10 years; 30% indicated the same for the climate-vulnerable industry. Such results are notable in light of subjects receiving a vignette describing the risks to these industries; outside experimental confines, where such information is not provided, this equivocation may be more common. However, subjects did on average indicate that the climate-forcing industry was more likely to decline than the climate-vulnerable industry (0.2 points on the five-point scale; $p = .008$, t -test; fig. 3A). Subjects were split on whether a climate-forcing or climate-vulnerable industry was more likely to receive subsidies; 53% said that the climate-forcing industry would be subsidized over the climate-vulnerable industry (fig. 3B). Additional summary statistics are available in appendix D.

Race and risk perceptions

Does an industry’s racial makeup affect its perceived risk of decline? Figure 4 (table 1) presents the average treatment effects of switching from a Black-majority workforce to a

22. Further, the goal of this study is not to compare the effects of racial makeup to other industry attributes or heuristics, though this is a promising direction for future work.

23. I opt for a general reference to “subsidies” given the diverse range of instruments governments can use to back climate-forcing or climate-vulnerable industries. This broad conceptualization of government support follows other recent work on climate-related transitions (Colgan et al. 2021).

24. The preregistration includes an outcome of perceived “likelihood of industry receiving government support.” This refers to both the subsidy question in the first experimental module and this worker support question. No other questions relating to government support were asked.

25. These beliefs are distinct from, though may be correlated with, levels of racial resentment and racial in-group identification (Jardina 2019; Kinder and Sanders 1996). Note that both the theory and this experimental design are agnostic with respect to administrative level. Public views of the level of government most responsible for industries’ fortunes (i.e., responsible for subsidy allocation) may vary, as may perceptions of government bias across administrative levels. I expect the heuristic described in the theory to operate when bias is perceived at the level of government seen as having sway over industries’ fortunes, regardless of whether that level is local, provincial/state, or national.

26. I include the rich and poor citizen to separate perceived racial bias from perceived class bias.

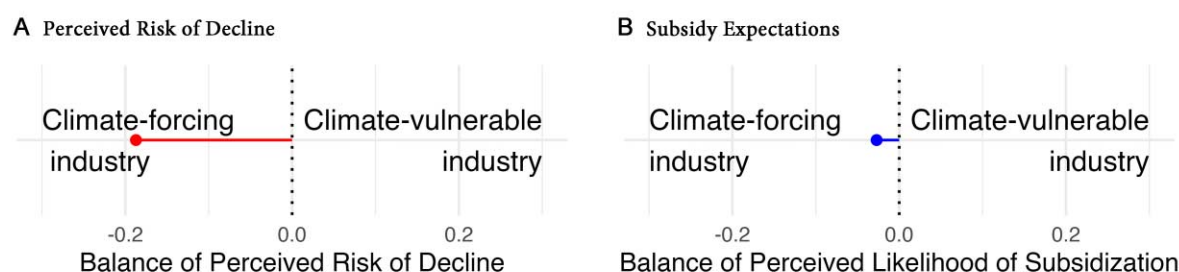


Figure 3. Control group beliefs about (A) relative risk of decline in climate-forcing and climate-vulnerable industries and (B) the industry most likely to receive government subsidies ($n = 408$).

white-majority workforce, conditional on prior beliefs about racial favoritism in government.²⁷ As anticipated, I find significant effects for subjects who believed the government favors white citizens. These subjects were sensitive to changes in the industries' racial composition, with risk perceptions shifting according to the balance of white and Black workers. Among these subjects, substantially less risk was seen to white-majority climate-forcing and climate-vulnerable industries—declines of 0.3–0.4 points on the five-point outcome scale (27%–41% of a standard deviation). I find small null results for subjects who did not believe the government favors white citizens and accordingly may have doubted that white-majority industries have distinct political advantages. These results are robust to Bonferroni corrections (app. E), randomization inference (app. F), alternative measures of perceived racial favoritism in government (app. G), specification as interaction models (app. H), and exclusion of subjects who failed an attention check (app. I).

As indicated in figure 4, these shifts in industries' racial makeup tilt the balance of perceived risks to climate-forcing and climate-vulnerable industries. Absent any racial information, subjects tended to see climate-forcing industries as at greater risk of decline. For subjects who saw white citizens as favored (fig. 4A), information indicating that the climate-forcing industry was mostly white—and climate-vulnerable industry mostly Black—inverted this balance of perceived risk. In this scenario, the climate-vulnerable industry was seen as most susceptible to decline. Conversely, the scenario with a Black-majority climate-forcing industry and white-majority climate-vulnerable industry compounded perceived risks to the former. Shifting the balance of white workers to the climate-forcing industry reduced its subjective risk of decline by 0.8 points relative to the climate-vulnerable industry.²⁸

27. Beliefs are measured here according to subjects' estimate of how the government would allocate tokens between a white and Black citizen (more tokens allocated to a white citizen than Black citizen, or not).

28. Ordinary least squares regression of the difference in the perceived risk to each industry on the treatment, plus covariates with block fixed effects and robust standard errors ($\hat{\beta} = -0.78$; $p < .001$; $SE = 0.17$).

Access to subsidies

The above theory expects these varied beliefs about industries' viability to be rooted in views of their access to public backstops. Here I test this mechanism, analyzing responses to a question about whether a climate-forcing or climate-vulnerable industry would be more likely to be subsidized than the other. This zero-sum framing reflects the "existential" competition between climate-forcing and climate-vulnerable industries for government support (Colgan et al. 2021). Beliefs about subsidies and industries' long-run profitability are closely correlated: subjects who believed the climate-forcing industry would be subsidized saw less risk of decline in that industry and, correspondingly, more risk of decline in the climate-vulnerable industry.²⁹

Figure 5 (table 2) illustrates that beliefs about subsidies are highly responsive to shifts in industries' racial composition. Pooling all subjects together, there is little evidence that differences in racial composition change subsidy expectations. But countervailing effects emerge when splitting the sample by prior beliefs about government favoritism. Among subjects who believed the government favors white citizens, shifting the composition of the climate-forcing industry to a white majority increased the perceived probability of it being subsidized by 20 points to roughly 70%. Others, skeptical of pro-white favoritism, saw the white-majority industry as marginally less likely to be subsidized than a Black-majority counterpart. The differences between these conditional average treatment effects are statistically significant. These results are robust to Bonferroni corrections (app. J), randomization inference (app. K), alternative measures of perceived racial favoritism (app. L), specification as an interaction model (app. M), and exclusion of inattentive subjects (app. N).

29. Subjects who expected the climate-forcing industry to be subsidized saw less risk of decline in that industry ($\hat{\beta} = -0.24$; $p < .001$; $SE = 0.07$) and greater risk to the climate-vulnerable industry ($\hat{\beta} = 0.31$; $p < .001$; $SE = 0.07$). Bivariate models estimated via ordinary least squares with block fixed effects.

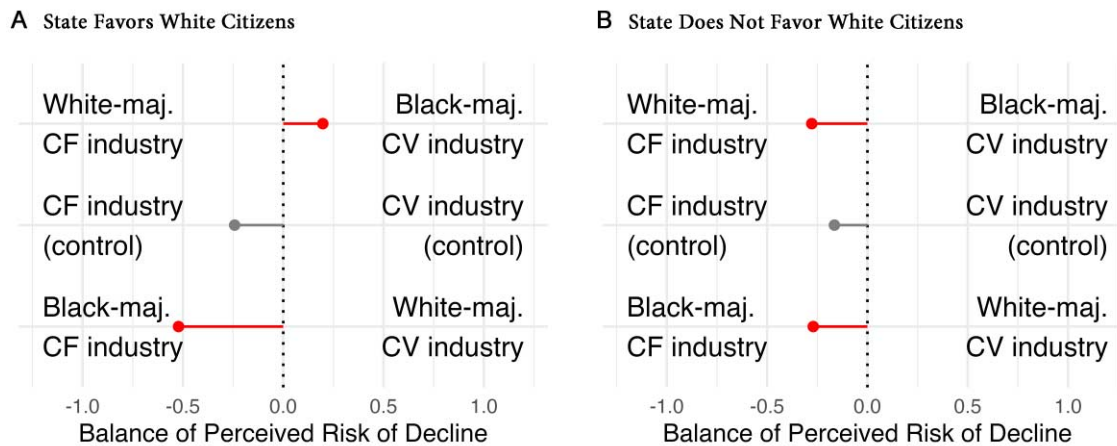


Figure 4. Ordinary least squares regression of perceived risk of industry decline, indicated on five-point scale, on racial makeup of industry (majority white or majority Black). Subjects separated by prior beliefs about racial bias in government. Block fixed effects included; robust standard errors parenthesized. Indicated models control for party identification, liberal-conservative ideology, age, gender, income, and education. Graphic contrasts perceived risk of decline in climate-forcing (CF) industry versus climate-vulnerable (CV) industry, by prior beliefs and treatment group (gray line indicates mean response for subjects receiving no race information).

Prior beliefs about racial bias in government thus split views about climate-forcing and climate-vulnerable industries: industries that principally employ members of subjectively privileged groups are seen as better protected than industries tied to subjectively disadvantaged groups and in turn better situated to weather future shocks. In line with this, I find that subsidy expectations mediate the effect of industries' racial composition on perceptions of their viability (app. O).

Subjects' written responses support this interpretation. A mix of minority and white respondents argued that pro-white bias in government would yield more subsidies for white-majority industries. "If one industry is mostly white, it has more political clout," wrote a white respondent who said the government would subsidize a white-majority climate-vulnerable industry. "Because there is a long history of responding more to needs of white people than to black people and that has not changed," explained another. Per one minority respondent, the government would prioritize a white-majority climate-forcing industry "because the white people always get more than *sic* the rest." Wrote a second minority respondent, "It's [a] white job like you said . . . that explains everything I need to know." Subjects who mentioned "white" in their written responses were nearly 30 points more likely to have answered that the white-majority industry would win government subsidies, suggesting that beliefs about favored groups were top of mind for subjects when considering industry futures.

Other subjects, principally white, contended that employing minorities would instead be to industries' advantage. "Everything is based on keeping black people happy," wrote

one white respondent. "They want to lean that way and appease blacks," added another, who said the government would subsidize a Black-majority climate-vulnerable industry over a white-majority fossil fuel industry. A third subject stated that the "government gives black folks more benefits than *sic* white folk." These written responses indicate that subjects' attitudes were shaped by expectations that the government would support industries in which favored groups clustered.³⁰

Worker security and political efficacy

Policies to facilitate orderly exits from climate-vulnerable and climate-forcing industries are attracting growing attention in political circles. Lawmakers and civil society groups have emphasized "just transitions" that move workers from fossil fuel industries to low-carbon alternatives. Some are calling for "managed retreats" from communities vulnerable to physical climate impacts (Carey 2020; Evans and Phelan 2016). Although governments may choose to encourage such exits, it is workers who will largely decide whether to remain in place, betting on the survival of local industries and jobs, or seek employment elsewhere. Do racial attitudes weigh on this choice?

The second survey experiment tests how the racial character of climate-forcing and climate-vulnerable workforces shapes beliefs about worker access to government protections and the returns to political mobilization (political efficacy). Presented with industries that randomly varied in their racial makeup, subjects were asked, "how much do you think the government would help people in this industry keep their

30. See app. P for regression results and structural topic models.

Table 1. Perceived Risk of Decline by Perceptions of Government Bias

	Perceived Risk of Decline (0–4)											
	Climate-Forcing Industry						Climate-Vulnerable Industry					
	All Subjects		Whites Favored		Whites Not Favored		All Subjects		Whites Favored		Whites Not Favored	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Perceived government bias												
Majority white	−.18*	−.22**	−.29*	−.32*	−.12	−.18	−.09	−.10	−.42***	−.45***	.14	.15
	(.07)	(.07)	(.13)	(.13)	(.11)	(.11)	(.07)	(.07)	(.12)	(.13)	(.10)	(.10)
N	975	927	314	304	436	409	966	917	313	302	430	403
Controls		Yes		Yes		Yes		Yes		Yes		Yes

* $p < .05$.
** $p < .01$.
*** $p < .001$.

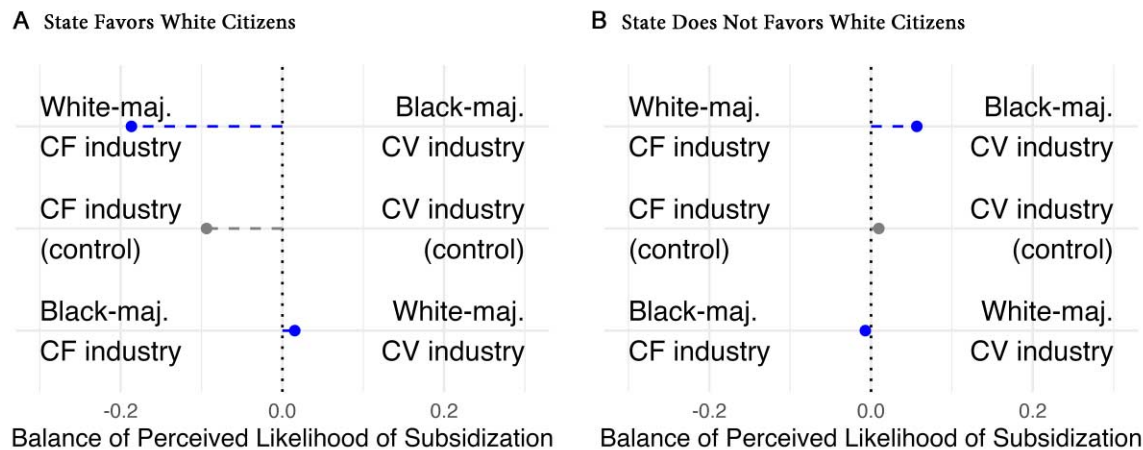


Figure 5. Regressions of perceived likelihood of climate-forcing (CF) industry being subsidized over a climate-vulnerable (CV) industry on racial balance of industries. Subjects separated by prior beliefs about racial bias in government. Block fixed effects included; robust standard errors parenthesized. Indicated models control for party identification, liberal-conservative ideology, age, gender, income, and education. Graphic indicates mean answers by prior beliefs and treatment condition (gray line indicates mean response for subjects receiving no race information).

jobs?" Subjects were further told to imagine they worked in the given industry and called their Senator or Congressperson asking for help in protecting in their job; they were then asked about how helpful they expect the legislator would be.

Estimation of models 1–3 in table 3 shows that an industry's racial composition powerfully affects beliefs about the government's intention to keep workers in their jobs. Subjects who saw white people as advantaged expected the government to devote more resources to protect jobs in white-majority industries than in Black-majority industries (difference of 0.7 points on a five-point scale). Subjects who doubted a pro-white bias in government responded differently. These subjects expected the government to invest more in protecting Black-majority workforces (declines of 0.1 points in support for white-majority workforces).

A workforce's racial makeup similarly affected the anticipated responsiveness of elected officials. Models 4–6 in table 3 indicate that subjects told they were working alongside members of subjectively privileged groups were more optimistic about legislator responsiveness. Among subjects who saw white citizens as favored, employment in white-majority workforces increased the expected returns to political mobilization by 0.6 points. Among other subjects, employment in a white-majority workforce reduced the anticipated efficacy of mobilization by 0.1 points.

These results are robust to Bonferroni corrections (app. Q), alternative measures of perceived racial favoritism (app. R), exclusion of inattentive subjects (app. S), and disaggregation of climate-forcing and climate-vulnerable industries (app. T). Both Democrats and Republicans exhibit similar responses to these racial cues, as do voters for Joe Biden and Donald

Table 2. Subsidy Expectations by Perceptions of Government Bias

	Pr(Subsidies for Climate-Forcing Industry = 1)					
	All Subjects		Whites Favored		Whites Not Favored	
Perceived government bias	(1)	(2)	(3)	(4)	(5)	(6)
White-majority climate-forcing industry	.05 (.03)	.04 (.03)	.20*** (.05)	.20*** (.06)	-.06 (.05)	-.08 (.05)
N	952	907	312	301	423	398
Controls		Yes		Yes		Yes

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3. Regressions of Perceived Likelihood of Government Employment Protection (Models 1–3) and Perceived Political Efficacy of Workers (Models 4–6) on Racial Composition of Industry

	Government Employment Protection (0–4)			Political Efficacy (0–4)		
	All Subjects	Whites Favored	Whites Not Favored	All Subjects	Whites Favored	Whites Not Favored
Perceived government bias	(1)	(2)	(3)	(4)	(5)	(6)
Majority white	.19*** (.03)	.71*** (.06)	–.15*** (.04)	.16*** (.03)	.59*** (.05)	–.10*** (.04)
N	5,800	1,878	2,567	5,798	1,879	2,566
Subjects	1,459	472	645	1,458	472	645

Note. Subjects separated by prior beliefs about racial bias in government. Subject fixed effects included; robust standard errors clustered by subject parenthesized. Indicated models control for party identification, liberal–conservative ideology, age, gender, income, and education.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Trump in 2020, wealthier and poorer respondents, subjects situated at opposite ends of the traditional racial resentment scale, and subjects who vary in perceived status threats. I moreover identify these effects among white, non-Hispanic subjects, minority subjects, and Black subjects, as well as subjects who vary in their concern about climate change (app. U). Independent of political preferences, class, racial animosity, and racial identification, prior beliefs about group favoritism in government cleave expectations about the security and political efficacy of workers.

DISCUSSION

These findings illuminate how perceived racial biases in government, in conjunction with the racial makeup of industry workforces, can transform expectations around the future of climate-forcing and climate-vulnerable industries. Given the uncertainties that pervade climate change and decarbonization, these highly salient ascriptive features of industries serve as a heuristic for evaluating their ability to stave off decline as economic disruptions mount. Industries associated with subjectively privileged groups are believed, rightly or wrongly, to have unique sway in government, making them well positioned to survive an era of climate-related economic dislocation. Workers in such industries are correspondingly seen as better able to mobilize for job protections. Collectively, these findings illustrate the importance of identity as a source of attitude formation around climate change and political contests between climate-forcing and climate-vulnerable industries.

As perceptions of racial and ethnic privilege are subjective, cleavages in risk perceptions likely emerge in ethno-

racially fragmented polities. The results described here show that the same industries are seen in different lights by different corners of the American public. Such varied risk attitudes have important implications for the “existential politics” of climate change: contestation between holders of climate-forcing and climate-vulnerable assets (Colgan et al. 2021). In the United States, climate-forcing industries are distinctly white, whereas climate-vulnerable local economies are often largely populated by minorities. This racial imbalance may shape how communities prepare for decarbonization and climate instability, evaluating whether to exit at-risk industries. Confidence in government backstops may render communities more sanguine about the status quo, perhaps unduly so given limits to what subsidies are able to accomplish.

This article suggests several routes for future research. The argument in this article should be most operative in countries where ethnoracial divisions are a dominant political cleavage and where there are accordingly popular expectations of ethnoracial favoritism in government decision-making (Goldman 2017). Countries such as India, where economic dislocations linked to climate change and decarbonization loom, may fall into this category. Some work suggests these criteria are less likely to be met in countries with less economic inequality and with proportional representation, not majoritarian, electoral systems (Huber 2012, 2017). Scholars might thus also explore how the argument holds in European countries where transition and physical risks are prominent but that feature milder economic inequities and distinct electoral rules.

Racial hierarchies and attitudes have proved to be sticky over time in the United States (Acharya et al. 2018). This

article's argument may be most applicable in contexts like this. Where patterns of group favoritism are not seen as entrenched or stable—for example, where power oscillates between parties representing different groups, or where the electoral utility of in-group voters frequently varies—such patterns may be less informative when projecting industry futures over the medium to long term. Comparing across polities that vary in the real or perceived stability of ethnoracial hierarchies is a fruitful direction for future work.

This article also rests on abstract experimental designs, as discussed above. Although such designs are valuable in “demonstrat[ing] that an effect exists,” they are less useful than more context-rich designs in estimating “how important an effect might be relative to other considerations” (Brutger et al. 2023, 981). Scholars should evaluate how the public views industries' ethnoracial makeup in relation to other heuristics or attributes, such as industries' class connotations or perceptions of their lobbying might. Conjoint experimentation or focus group discussions may be well suited for assessing the relative salience and effect size of multiple industry characteristics. Scholars might also contrast climate-forcing and climate-vulnerable industries to those facing other types of economic disruption, such as import competition. The heuristic described in this article may be less influential in areas marked by less uncertainty, such as where historical precedents for industrial decline are more readily available for use in estimating industry futures.

Furthermore, researchers might consider how groups look to overcome political exclusion in pursuit of support for certain workforces and delineate when such efforts are likely to succeed. Where racial groups segment into climate-forcing and climate-vulnerable industries, might contests over climate policy exacerbate political conflict along racial lines? Lastly, scholars should explore how racial and ethnic information affects the risk decision-making of elite actors, such as institutional investors. Findings that mass behaviors replicate for elites, as well as work highlighting investors' reliance on heuristics (Brooks et al. 2015; Kertzer 2022), hint that ascriptive features of industries may mold how financial actors perceive and manage risk. The racial and ethnic conflicts that mark much of the world may hold important insights into whether the risks of climate change and decarbonization will be averted or left to intensify.

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