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Fossil fuel divestment and public climate change policy preferences: an experimental test in three countries

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ABSTRACT

Divestment is a prominent strategy championed by activists to induce positive social change. For example, the current fossil fuel divestment movement includes over 1,500 institutions that control \$40 trillion in assets. A primary pathway through which divestment is theorized to be effective is by influencing public beliefs and policy preferences, thus pressuring policymakers to take action. However, prior research only tests this argument via qualitative case studies. We assess the impact of exposure to information about fossil fuel divestment on public opinion through the use of national survey experiments in three major greenhouse gas emitters: the U.S., India, and South Africa. We find surprisingly little evidence that exposure to information about the fossil fuel divestment movement can increase public support for policies that address climate change. Our findings suggest that divestment movements may be less effective at changing beliefs and policy preferences than previously realized.

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KEYWORDS Divestment; climate change; fossil fuel; public opinion; activism; social movements

Introduction

‘The hope is that divestment is one way to weaken [fossil fuel] companies—financially, but even more politically. If institutions like colleges and churches turn them into pariahs, their two-decade old chokehold on politics in DC and other capitals will start to slip.’

— Bill McKibben

Climate change is one of the most pressing challenges of our era, with scientists warning we have little time left in order to stave off catastrophic

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effects. A prominent strategy environmental activists have championed to address climate change is divestment from fossil fuel companies. Following the divestment campaign in the 1980s against apartheid South Africa, divestment movements have developed in many contexts, ranging from the genocide in Darfur and Israel's policies vis-à-vis the Palestinians to the tobacco industry. The most prominent contemporary divestment movement is the campaign to divest from fossil fuel companies. Currently, over 1,500 entities controlling almost \$40 *trillion* in assets—such as the Irish government, New York City, The Rockefeller Foundation, Harvard University, and the World Council of Churches—are part of this movement.¹

Intuitively, divestment movements can induce social change through the financial mechanism of directly starving offending companies or countries of funds, thereby forcing them to change their deleterious behavior or forcing them out of business entirely. Nevertheless, extant studies of the South African case find mixed results, with many concluding it had only a modest and transitory *financial* impact on the targeted entities.² These findings and the underlying economics of the fossil fuel industry have thus led to skepticism that divestment can significantly erode the profitability of the industry in the short-term, even though progress is urgently needed (Ansar *et al.* 2013, Cheon and Urpelainen 2018).

As illustrated by the opening quote, many scholars and prominent environmental activists like Bill McKibben argue divestment movements can help combat climate change through a second pathway: by influencing public beliefs and policy preferences and thus pressuring policymakers to take action. Some argue that shaping public beliefs and policy preferences is the primary pathway through which divestment movements have been successful in the past and will be successful in the future (Ansar *et al.* 2013, Cheon and Urpelainen 2018). But does exposure to information about the divestment movement actually influence the mass public's policy preferences on contentious issues like climate change?

There is little empirical work that tests the effect of divestment on the public's policy preferences. The few studies that do—while extremely valuable—largely rely on informal qualitative case studies (Ansar *et al.* 2013, Seidman 2015, Gunningham 2017, Cheon and Urpelainen 2018). Our study addresses this gap in the literature by conducting the first experimental analysis of the impact of exposure to information about fossil fuel divestment on the public's policy preferences, which enables us to make more credible causal inferences.

Building on the signaling and informational intervention literature in American politics (e.g., Lohmann 1993, Gillion 2013, Wouters and Walgrave 2017, Gause 2022, Lendway 2021) and international relations (e.g., Fearon 1997), we pre-registered a theory that exposure to information about divestment movements impacts public beliefs by acting as an

informational signal about the beliefs of the divesting organizations. Armed with this new information and drawing from previous literature (e.g., Mangat *et al.* 2018, Hestres and Hopke 2020), we expected respondents would view fossil fuel companies less favorably and be more likely to be concerned about climate change in an absolute sense and relative to other issue-areas. Through these mechanisms, we hypothesized that individuals would be more likely to support government policies to combat climate change. We further theorized that exposure to information about divestment would have a greater impact on the public's policy preferences when framed as more financially costly to the entity divesting and when a more diverse group of entities engage in divestment. In these cases, divestment should be viewed as a stronger and more credible signal of an institution's commitment to climate action, and the fossil fuel divestment movement should be perceived as more widespread.

To test this theory, we conducted a series of national survey experiments in three countries that are large emitters of greenhouse gasses and vary from each other culturally and geographically: the U.S., India, and South Africa. While testing all the different ways in which divestment might positively contribute to climate change mitigation efforts is beyond the scope of this paper, we employ an experimental approach in order to isolate the impact of exposure to information about the divestment movement from other potential confounders—such as natural disasters (Hazlett and Mildemberger 2020), elite cues (Egan and Mullin 2017), and economic conditions (Guber 2013)—that could impact public beliefs and preferences and are difficult to disentangle in case studies. Besides testing our theory in different countries, we also test it using two different types of experimental treatments: a written vignette and a video treatment. Prior research demonstrates that video treatments can have a greater impact on public opinion than text treatments, making this an easier test of our theory (Wittenberg *et al.* 2021).

Surprisingly, and in contrast to our pre-registered expectations, we find little systematic evidence that exposure to information about divestment increases public support for policies that address climate change or impacts beliefs about fossil fuel companies. The effects we find are either statistically indistinguishable from zero or substantively negligible.

Although our findings *do not imply* that divestment movements can *never* impact the public's policy preferences—especially for issues where the public's views are less polarized and sticky than climate change—they do suggest that divestment movements may be less effective at changing policy preferences than the conventional wisdom suggests because the mass public may not be updating their climate change beliefs and preferences upon learning new information about the divestment campaign. Of course, our specific study does not test all the ways in which information about divestment can

impact public beliefs and preferences, and thus future work should continue to address this question.

Additionally, divestment may have positive effects through other pathways. For example, it may put financial pressure on firms and investors to change their behavior. Furthermore, it could encourage individuals to become climate change activists and engage in other activities (e.g., protests) that do move the public's policy preferences. Future research could complement and extend this study by exploring these additional ways in which divestment movements can induce positive change.

Overall, this project makes several important contributions. First, it contributes to the literature on nonviolent action and social movements (e.g., Chenoweth and Stephan 2011, Gillion 2013, Wasow 2020) by conducting the first systematic, experimental assessment of whether exposure to information about fossil fuel divestment—a commonly used strategy—is effective. Second, it contributes to the growing literature on climate change and public opinion, providing an additional explanation for why government action to combat climate change has been limited (e.g., Egan and Mullin 2017, Mangat *et al.* 2018, Hestres and Hopke 2020, Mildenberger 2020, Stokes 2020). Third, it contributes to the American politics and international relations literatures on signaling and informational interventions by applying its logic to the case of fossil fuel divestment. Finally, this project has important practical ramifications for climate change activists. Our findings suggest that exposure to information about a large number of institutions divesting may not, *by itself*, be as effective at moving beliefs and policy preferences among the mass public as previously thought. Activists should therefore further explore the specific conditions under which information about divestment is most likely to shift the views of the public in order to maximize the efficacy of divestment campaigns. For example, perhaps if particularly prominent and popular organizations divest, then the public will be more likely to shift their beliefs and preferences. Activists should also vigorously pursue other pathways through which divestment may have a positive impact on climate change, such as shareholder activism and large-scale protests.

Literature review

Scholars have found various determinants of climate change beliefs and attitudes. Strong correlates include age (Ross *et al.* 2019), gender (McCright 2010), partisanship (Dunlap and McCright 2008), race (Benegal 2018), and more. But to what extent can we expect external stimuli—like exposure to information about the fossil fuel divestment movement—to affect climate change attitudes?

An emerging literature explores the effect of interventions—both experimental and natural—on climate change beliefs and preferences. Rode *et al.*

(2021) conduct a meta-analysis of 76 experimental interventions ($n = 76,033$) aiming to affect climate change attitudes. They find that these interventions generally *did* have a positive, statistically significant effect on climate change attitudes. Although the effect sizes were typically small, this meta-analysis suggests it is at least plausible that exposure to information about the fossil fuel divestment movement in the context of a survey experiment could significantly affect respondents' climate change attitudes.

Beyond survey experimental interventions, examples of real-world interventions shown to significantly affect climate change beliefs or preferences include floods (Osberghaus and Fugger 2022), forest fires (Hazlett and Mildenerger 2020), and hurricanes (Rudman *et al.* 2013). While not all studies on natural interventions find significant effects, the ones that do illustrate that climate beliefs are not necessarily immovable.

Given the growth of the fossil fuel divestment movement, an emerging literature has sought to assess its societal effects. Intuitively, divestment from fossil fuel companies may have *direct* effects by starving the industry of funding. Per this line of thinking, some prior research evaluates the effect of the divestment movement on financial outcomes. For example, Cojoianu *et al.* (2021) analyze the impact of divestment on fossil fuel company financing in over 30 countries and find that it is associated with lower capital flows to domestic oil and gas companies. However, they also point out that oil and gas financing has increased in the aggregate since the divestment movement began in 2008 and banks located in countries with significant fossil fuel divestment movements actually provide *more* financing to *foreign* fossil fuel companies. Findings like these and the underlying economics of the fossil fuel industry have thus led to skepticism that divestment can have a major effect on climate change via a direct, financial mechanism in time to stave off catastrophic global warming (Ansar *et al.* 2013, Bergman 2018, Cheon and Urpelainen 2018).

On the other hand, there is greater optimism among scholars and activists that the divestment movement can combat climate change via more indirect pathways (Ansar *et al.* 2013, Bergman 2018, Cheon and Urpelainen 2018). This was the argument made by McKibben, who was the intellectual founder of the divestment movement. As summarized by Seidman (2015, p. 1015), McKibben believed that divestment 'would shift public opinion, stigmatize the fossil fuel industry, and mobilize pressure on community leaders and politicians.' In other words, divestment's potential indirect impacts—such as influencing public beliefs and policy preferences and in turn pressuring policymakers to take action—may be much more significant than its potential to directly affect fossil fuel companies financially.

Through what specific mechanisms has the fossil fuel divestment movement been theorized to be an important mover of public climate change policy preferences? First, divestment may *stigmatize* fossil fuel companies in

the eyes of the public (Seidman 2015, Bergman 2018, Mangat *et al.* 2018, Hestres and Hopke 2020). Second, divestment may increase absolute and relative public concern about climate change by creating ‘wide public awareness about the issues’ (Ansar *et al.* 2013, p. 49). More generally, the divestment movement may help create a new social norm: ‘a fundamental aim of the divestment movement is to convince target audiences to embrace a new norm: the desirability of going “fossil free,” implying the need to transition to a zero-carbon economy’ (Gunningham 2017, p. 376).

Though the literature on fossil fuel divestment has advanced significantly in recent years, important gaps remain. First, while scholars have theorized divestment can move public beliefs and policy preferences, less attention has been paid to the conditions under which divestment is likely to be more or less effective at doing so. Second, though scholars have empirically analyzed the impact of the fossil fuel divestment movement through the use of qualitative methods like interviews (Bergman 2018, Hestres and Hopke 2020) and case studies (Ansar *et al.* 2013, Seidman 2015, Cheon and Urpelainen 2018), an important gap in the literature is the general lack of experimental research in this area. Given that factors such as natural disasters (Hazlett and Mildemberger 2020), elite cues (Egan and Mullin 2017), and economic conditions (Guber 2013) can make it difficult to causally identify the impact of the fossil fuel divestment movement in qualitative, observational research, an experimental approach where treatments can be randomly assigned and relevant factors controlled for can help move the literature forward. This is not to say experiments are a panacea (like any method they have important weaknesses), but they can complement and extend prior work by making causal inference more feasible. We address these two gaps by first developing a theory of how and under what conditions information about the fossil fuel divestment movement can impact public beliefs and policy preferences, and then testing our theory in a series of cross-national survey experiments.

Theory

Main effect & mechanisms: can divestment move public beliefs and policy preferences?

Building on the signaling and informational intervention literature in American politics (e.g., Lohmann 1993, Gillion 2013, Wouters and Walgrave 2017, Gause 2022, Lendway 2021) and international relations (e.g., Fearon 1997), we expect that divestment can move public beliefs and policy preferences because it acts as an informational signal about the beliefs of the divesting organizations. For example, mass protests about racial inequities signal that many members of the public believe the issue is

important and urgently requires corrective action, and these types of protests have been shown to impact public opinion and government policy (e.g., Gillion 2013, Wasow 2020). Military exercises or mobilizations can likewise communicate a state's resolve to foreign adversaries (Fearon 1997).

We begin by considering possible mechanisms. In particular, we hypothesize that exposure to information about divestment can shift the public's beliefs on three dimensions—their view of fossil fuel companies, their absolute concern with climate change as an issue, and their relative concern with climate change as an issue—which may then impact the public's policy preferences.³ The most immediate and direct goal of the divestment movement is to stigmatize investing in fossil fuel companies. First and foremost, divestment signals that fossil fuel companies are engaged in an illogical and even potentially immoral enterprise (Mangat *et al.* 2018). Thus, divestment from fossil fuel companies might have a stigmatizing impact whereby the public is less likely to view fossil fuel companies favorably since they are negatively contributing to an important societal issue (Ansar *et al.* 2013, Cheon and Urpelainen 2018, Hestres and Hopke 2020). In fact, two of the most prominent narratives associated with the discourse on divestment are that fossil fuel companies are an enemy and that doing business with the enemy is immoral (Mangat *et al.* 2018).

We also expect that exposure to information about divestment will make the public more likely to believe climate change is a significant threat and more likely to believe climate change should be prioritized over other issues. After all, fossil fuel divestment signals that climate change is real and a threat, or else divestment would not be necessary. To the extent that divestment also signals that investment in fossil fuel companies rises to the level of immorality, that may be a strong indication to members of the public that climate change is a particularly severe threat compared to other issue-areas. Although there are reasons—detailed below—why we may expect a null result for this hypothesis (and others), findings from the literature on protest demonstrate that this pre-registered expectation is at least plausible. For example, Gillion (2013) finds statistical evidence that the presence of race-related protests is associated with a greater percentage of Americans indicating that race relations are the biggest problem facing the country. Consequently, our experimental test of this hypothesis can help adjudicate between competing expectations.

*H*₁ (*Mechanism Hypotheses*): Relative to those who do not receive information about a group of organizations divesting from fossil fuel companies, those who do will be more likely to (a) view fossil fuel companies unfavorably, (b) be concerned about climate change, and (c) prioritize climate change action relative to other issues.

If exposure to information about divestment changes public beliefs as outlined above, then that could, in turn, increase public support for government policies to combat climate change. First, if divestment stigmatizes the fossil fuel industry, then the public should be more willing to enact public policies that harm the fossil fuel industry economically. Prior research also shows a relationship between these kinds of beliefs and support for environmental policies (Huber *et al.* 2020). Second, if divestment increases beliefs about the salience of climate change as an issue, then that should make the public more likely to support public policies that combat climate change. However, it is important to note that not all key players in the fossil fuel divestment movement are focused on how it could ultimately impact public policy, but instead are concentrated on the effect divestment may have on fossil fuel companies more narrowly (e.g., on their favorability). However, many do believe public policy change is a critical goal of the movement. For example, Cheon and Urpelainen (2018, p. 96) note that, ‘The eventual goal of divestment is to sway the greatest institutions of power, namely governments themselves.’ Furthermore, scholars like Ansar *et al.* (2013) have argued and provided qualitative empirical evidence that divestment movements *can impact* government policy by increasing public support for such measures. Therefore, although there are some strong theoretical reasons to expect that divestment may not impact the public’s policy preferences—which we detail below—we believe this remains an open question that deserves further empirical scrutiny.

H₂ (Policy Support Hypothesis): Relative to those who do not receive information about a group of organizations divesting from fossil fuel companies, those who do will be more likely to support government policies to combat climate change.

As discussed in our pre-registration, a null effect is also a strong possibility in contrast to H_1 and H_2 . Signals such as divestment may be most likely to have an impact on public beliefs and policy preferences in the context of low-information issues and those that the public does not yet have strong opinions on. Since climate change has been well-publicized and is a polarizing issue, the public’s climate change policy preferences may be sticky (Egan and Mullin 2017). Consequently, divestment may not be a sufficiently strong signal to shift the public’s policy preferences, even though prior studies demonstrate it is not impossible for experimental interventions to significantly impact these preferences (Rode *et al.* 2021). Furthermore, exposure to information about the fossil fuel divestment movement could even steer the public conversation and redirect individuals’ thoughts away from government policies and more towards non-government actions like corporate divestment. If this is the case, then members of the public who receive information about fossil fuel divestment

may not make the connection that government policies could and should be used to address climate change.⁴

Moderators: when is divestment likely to be more or less successful?

If divestment affects public beliefs and policy preferences by acting as an informative signal, then it is likely to have a greater impact when that signal is stronger. Although there are many factors that could affect the strength of a signal, in the case of divestment we hypothesized that two especially important elements are (a) how financially costly divestment is and (b) the diversity of entities divesting.

First, when divestment is perceived as more financially costly to the institution divesting, then divestment should be viewed as a stronger and more credible signal of an institution's commitment to climate action. An analogous argument is made in the international relations literature, as only financially costly actions—like military mobilizations—or those that raise the risk of a devastating war—like launch-on-warning nuclear alerts—may convince adversaries that you are not bluffing (Fearon 1997). In the literature on social movements, displaying 'commitment' to a cause by engaging in physically risky or financially costly behavior also increases the strength and credibility of a signal (Tilly 2004, Gillion 2013, Wouters and Walgrave 2017).

H₃ (*Costliness Hypothesis*): Relative to those who receive information that divestment is *less* financially costly to the organizations divesting, those who receive information that the divestment is *more* financially costly to the organizations divesting will be more likely to support government policies to combat climate change.

Second, a more diverse group of institutions divesting could also lead to a greater impact on public beliefs and policy preferences because it enhances the likelihood that members of the public will positively identify with at least one of the organizations divesting, making them more susceptible to influence by that entity. For example, Wouters (2019) conducted experimental studies examining public support for asylum seeker demonstrations in Belgium and Black Lives Matter protests in the U.S. and varied the diversity of the demonstrators. He found that support for the demonstrations increased when they were portrayed as including a wide variety of groups rather than mostly undocumented immigrants or Black Americans. Furthermore, given that prior research shows that going 'against type' can increase the credibility of signals (e.g., Mattes and Weeks 2019), a more diverse and surprising array of institutions divesting could increase the strength of the signal it sends to the public.

H₄ (*Diversity Hypothesis*): Relative to those who receive information that the group of organizations divesting is *less* diverse, those who receive information

that the group of organizations divesting is *more* diverse will be more likely to support government policies to combat climate change.

Methods

We conducted four survey experiments to assess the effect of exposure to information about divestment on public beliefs and policy preferences. Each study was administered over the online survey platform Lucid. Studies 1–4 were in the U.S., India, South Africa, and the U.S., respectively. To mitigate the possibility of respondent inattention, we utilized a *pre-treatment* attention screener in all four studies in accordance with best practices in the literature (Berinsky *et al.* 2014). If anything, this design choice should increase the probability of finding significant effects. However, prior research establishes that removing inattentive respondents *before* the treatment is presented does not lead to bias (Aronow *et al.* 2019). Following the attention screener, subjects were asked a variety of standard demographic questions (party identification etc.) before being randomly assigned to one of several conditions.

Table 1 outlines the experimental design for each of our studies, which we discuss in more detail below. Studies 1–3 were fully-crossed $2 \times 2 \times 2$ between-subjects designs where respondents were presented with a mock news article claiming to be from the Associated Press that discussed a group of 1,000 organizations that were considering divesting from fossil fuel companies. This is a realistic way in which members of the American public might be exposed to information about the divestment movement. For example, a 2020 article in the *Wall Street Journal* discussed 1,200 institutions that pledged to divest from fossil fuel companies (Toplensky 2020), and many other prominent news outlets have published similar articles. We then experimentally manipulated whether the organizations discussed ultimately decide to divest (yes or no), the diversity of organizations discussed (high or low), and the expected financial costs of divestment (high or low). In Study 1 we also included a no information condition that can be used to measure baseline support for climate policies. Study 4 included our theoretically strongest text-based treatment (divestment, high diversity, and high costs), along with a video treatment discussing the fossil fuel divestment movement, a written transcript of the video, and a no information condition.

At the end of the survey, subjects in all four studies were asked a series of questions designed to measure their support for government policies to address climate change (to test H_2 , H_3 , and H_4), as well as their beliefs about climate change and attitudes towards fossil fuel companies (to test H_1). For completeness, we ask about a variety of climate change mitigation policies, including government spending, regulations, taxes, tax subsidies,

Table 1: Summary of Experimental Designs

Study	Country	Text Conditions									
		Divest	No Divest	High Diversity	Low Diversity	High Cost	Low Cost	Video Condition	Video Transcript Condition	No Information Condition	
Study 1	United States	✓	✓	✓	✓	✓	✓	X	X	✓	
Study 2	India	✓	✓	✓	✓	✓	✓	X	X	X	
Study 3	South Africa	✓	✓	✓	✓	✓	✓	X	X	X	
Study 4	United States	✓	X	✓	X	✓	X	✓	✓	✓	

and international agreements. The survey also includes questions about support for climate change adaptation policies and compensation to communities hurt by climate change. The dependent variable questions for all four studies are listed in Table 2.

In general, we expect our hypotheses should also hold among citizens of India and South Africa, in addition to American citizens. In all of these contexts, exposure to information about fossil fuel divestment should signal to people in these countries that climate change is real, a threat, and requires action to combat it, potentially increasing support for policies to address climate change. Of course, there are differences between these countries that could lead to divergent effects. For example, India and South Africa's per person income is lower than the U.S., which could make citizens more hesitant to support climate policies that may be perceived as harming economic growth. On the other hand, some evidence suggests India and South Africa are more vulnerable to climate change than the US⁵ and that the citizens of these countries are more personally concerned about climate change than American citizens (Leiserowitz *et al.* 2022, p. 13), potentially increasing their openness to policies that combat climate change relative to U.S. citizens. Given these countervailing logics, we do not make any *ex ante* hypotheses about potential differences between these countries.

Table 2. Dependent variable questions for all studies.

Type	Label	Statement
Policy Support Questions (Strongly Approve – Strongly Disapprove)	Carbon Tax	A carbon tax on companies that burn fossil fuels
	Regulations	Regulations to reduce the burning of fossil fuels
	Clean Energy	Public investments in clean energy technology
	Tax Breaks	Tax breaks for businesses and individuals investing in clean energy
	Paris Agreement	The U.S./India/South Africa should be a member of the Paris Climate Agreement
	Divestment Law	A policy that would require state and local public pensions to remove any investments from fossil fuel companies
	Infrastructure	Public investments to harden infrastructure in preparation for the effects of climate change
Mechanism Questions	Economic Compensation	Economic compensation to communities and individuals negatively impacted by climate change
	Gasoline Tax	By how many cents/rupees per gallon/litre should national gasoline/petrol taxes be increased?
	Absolute Concern	How worried are you about climate change? (Very Worried – Not At All Worried)
	Relative Concern 1	How high a priority should it be for the government to implement policies to reduce climate change? (Essential – Not A Priority)
	Relative Concern 2	Combatting climate change should be given priority, even at the risk of curbing economic growth (Strongly Agree – Strongly Disagree)
	Stigma	How do you view the fossil fuel industry like oil, coal, and gas companies? (Very Unfavorably – Very Favorably)

Study 1: the impact of exposure to information about divestment on U.S. citizens

In Study 1, we focused on U.S. citizens because America is the second largest emitter of greenhouse gasses in the world (behind only China), meaning U.S. environmental policy is substantively important for combatting climate change and thus essential to study. We completed this experiment in July 2021 using the online survey platform Lucid ($n = 1,629$). Lucid's U.S. samples are nationally representative based on age, gender, ethnicity, and region, and have been shown to perform well replicating previous studies (Coppock and McClellan 2019), even during the COVID-19 pandemic (Peyton *et al.* 2021).

As a test of the *Diversity Hypothesis*, we varied whether the relevant organizations included a narrow set of institutions that are likely predisposed to support divestment from fossil fuel companies—environmental nonprofits and universities—or a wider range of institutions, some of which—like faith-based organizations and for-profit businesses—may be viewed as less prone to divest from fossil fuel companies. This treatment is based on accurate elements of the fossil fuel divestment movement, as all of these types of organizations have actually divested.⁶

While an alternative experimental design could involve the divestment decision of one or a handful of *specific* organizations (e.g., Harvard University, the Rockefeller Foundation, or Liberty Mutual rather than 'universities' or 'for-profit organizations' more broadly), we opt for a marginally more abstract design for three reasons. First, we doubt that a single, specific organization divesting would be a strong enough signal to move public beliefs and policy preferences, and thus do not believe it would be a fair test of divestment as a tool of social change. Second, while messenger effects could lead to divestment having a larger impact on public beliefs and policy preferences if a group of specific institutions that are viewed favorably by the American public decide to divest relative to if a group of unnamed institutions decide to divest, it could also have the opposite effect if the specific institutions are viewed unfavorably by segments of the population. Since our results would be sensitive to the choice of specific institution(s) under this alternative design, we believe our more abstract design may have greater external validity and avoids priming effects. Finally, new research by Brutger *et al.* (2022) establishes that a more abstract experimental design better enables researchers to identify whether an effect exists at all, which is the primary goal of our study. Though increasing contextual detail about the organizations discussed in the vignette is certainly an avenue for future research, Brutger *et al.* (2022) also show that doing so does not typically result in substantively different results.

In order to evaluate the *Costliness Hypothesis*, we varied whether analysts expect divesting will significantly reduce the amount of money organizations make from their investments. Finally, the institutions discussed in the article decided whether or not to divest.

Study 2: external validity to Indian citizens

The design of Study 2 was substantively identical to Study 1.⁷ However, instead of being conducted on U.S. citizens, Study 2 was conducted via Lucid on citizens of India (n = 711) and was completed in September 2021. We administered this study in India for three reasons. First, India is the third largest emitter of greenhouse gasses globally. Consequently, the views held by Indian citizens are especially relevant for combatting climate change from a global perspective. Second, non-Western countries are generally understudied in political science. Finally, surveying the public in India provides useful cultural and geographic variation relative to Study 1 and thus helps test the external validity of our findings.

Our sample of Indian citizens is representative based on age, and it also tracks relatively well with actual political identification in India. In terms of political identification, about 55% of the sample identifies with the BJP, 16% with the INC, and the remaining respondents with a different party or no party. According to a large-scale Pew poll (30,000 respondents) conducted between November 2019 and March 2020, about 39% of the Indian general population felt closest to the BJP and 14% to the INC.⁸ The differences between this Pew poll and political identification in Study 2 could be a result of two factors. First, there is some evidence that Indian citizens may have drifted towards the BJP since 2019/2020. Second, a large percentage of respondents in the Pew poll (23%) refused to answer the political identification question, an option we did not provide respondents in Study 2. Presumably, at least some of these respondents would identify with the BJP or INC. Moreover, if we assume the distribution of political identification among these respondents roughly mirrors that of respondents that did answer the question, then 48% of Indian citizens would identify with the BJP and 17% with the INC, which is much closer to the breakdown in Study 2. In any case, impact of divestment does not significantly vary by political identification, which implies that any skews in this variable are not significantly biasing the results.

The sample utilized in Study 2 is highly skewed when it comes to education relative to the general population of India. Specifically, the percentage of college graduates in Study 2 is significantly higher than the general Indian population. However, the impact to information about divestment does not significantly vary by education level. This suggests that the education skew is not significantly biasing the results. Similar to education, the sample also has

higher levels of income compared to the general population of India and over-represents men. Nevertheless, the effect of exposure to information about fossil fuel divestment also does not significantly vary by income level or gender.

In sum, though our sample of Indian citizens differs from the general population in some important respects, the results from this study are (a) still internally valid to the population sampled as a result of treatments being randomly assigned to respondents, and (b) there is no statistically significant evidence that suggests our results would not be externally valid to a more representative sample.

Study 3: external validity to South African citizens

The design of Study 3 was also substantively identical to Studies 1 and 2, but was conducted via Lucid in South Africa (n = 575) and was completed in September 2021. South Africa was selected for similar reasons that India was chosen for Study 2: it is a relatively large contributor to global climate change, the biggest emitter in Africa, and it provides cultural and geographic variation compared to Study 1, enabling us to test the external validity of our results.

The South African sample in Study 3 was generally representative of the broader South African population. In terms of political identification, about a third of the sample in Study 3 identifies with the African National Congress (ANC) party, the largest party in South Africa. This tracks well with a nationally representative poll conducted by IPSOS a few weeks before we fielded our study, which found about 35% of South Africans intended to support the ANC in the upcoming local elections.⁹ Although our sample appears to over-represent support for the Democratic Alliance party, we find no evidence that the impact of divestment varies significantly for supporters of the Democratic Alliance compared to other parties.

Our sample also tracks well with the general South African population when it comes to education. About 7.5% of respondents in Study 3 have a 2 or 4-year college degree, which is nearly identical to the 6% of South Africans in the general population that have a college degree.¹⁰

If anything, income levels in our sample are a bit lower than the average in South Africa and Study 3 appears to over-represent women. However, the effect of exposure to information about fossil fuel divestment does not differ significantly by income or gender. This suggests that any skews in income and gender are not significantly biasing the results.

Study 4: external validity to a video treatment

Like Study 1, Study 4 was completed in December 2021 using Lucid on a nationally representative sample of U.S. citizens ($n = 1,030$). The major innovation of Study 4 is to employ a video treatment created by 350.org, a real-life non-profit organization focused on combatting climate change and the most prominent NGO in the fossil fuel divestment campaign. There are two principal benefits of utilizing a video treatment from 350.org rather than a text-based treatment. First, prior research demonstrates that video treatments can have a greater impact on public opinion than text treatments, making this an easier test of our theory (Wittenberg *et al.* 2021). Second, this video treatment gains external validity over our previous text-based treatment since the video is actually part of the real-life fossil fuel divestment movement.

More specifically, Study 4 was a four factor between-subjects experiment where respondents were randomly assigned to a control group or one of three treatment groups. The control group received no information about the divestment movement. The first treatment group received the video from 350.org. The content of the video bears strong similarities to our vignette from Study 1 in that it (a) discusses the number of institutions that have divested from fossil fuel companies, (b) notes the dollar amount of assets these institutions control, and (c) highlights the diversity of the divestment movement by discussing the significant number of faith-based institutions that have divested. The second treatment condition consisted of a written transcript of the video, which enables us to directly test whether video treatments do indeed have a greater impact on public beliefs and policy preferences than text-based treatments for this issue. Finally, we included the theoretically strongest text-based treatment from Study 1: divestment, high diversity, and high cost. This allows us to probe whether the differences in language between Study 1 and the video/transcript treatments in Study 4 drive divergent results. We use the same outcome measures in Study 4 as we did in Studies 1–3.

Results

For ease of interpretation, we create binary versions of support for each of our eight policy measures and then create an aggregate climate change policy index.¹¹ As shown in the appendix, substantively identical results emerge when the full 5-point scale of support is utilized, the policy index is disaggregated into its eight component parts, and covariates are controlled for. To test the *Policy Support Hypothesis*, Figure 1 displays the percentage point change in support for climate change policies for respondents assigned to the divestment condition compared to respondents assigned to either the no divestment condition (left-hand side of the figure) or the no information condition (right-hand side of the figure). All four of our studies should be

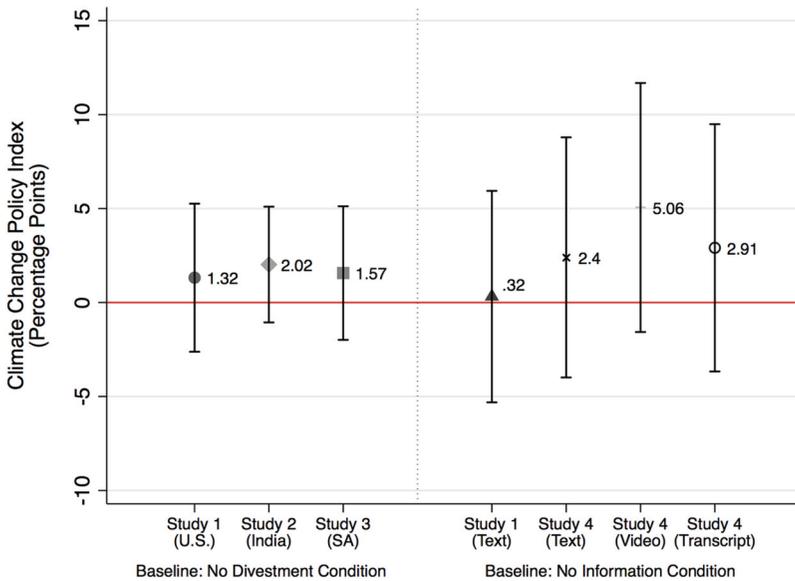


Figure 1. The impact of exposure to information about divestment on climate change policy preferences. Note: Error bars reflect 95% confidence intervals.

sufficiently powered for this analysis. When comparing respondents in the divestment condition to respondents in the no divestment condition, there are about 700 respondents per experimental treatment in Study 1 and over 250 respondents per condition in Studies 2–4.

Across all four of our studies, we find *no* statistically significant support for the contention that fossil fuel divestment can impact the public’s climate policy preferences.¹² In the appendix, we also estimate interaction models and show that the results do not vary significantly based on political identification, climate change belief, education, gender, and other relevant covariates.¹³

Consistent with a null main effect, we do not find consistent support in [Figure 2](#) for any of our mechanism hypotheses outlined in H_1 . Overall, then, we find surprisingly little experimental evidence that exposure to information about divestment can increase public support for policies that address climate change, though, of course, our results are not dispositive.

What explains this null result? Some potentially problematic possibilities are that respondents either (a) did not believe our divestment treatment, (b) already knew about the relatively large-scale fossil fuel divestment movement and thus our treatment did not provide any new information, or (c) respondents did not pay attention to our treatments, even though we screened out inattentive respondents at the beginning of the study. To probe these possibilities, [Figure 3](#) presents results from a post-treatment question we asked

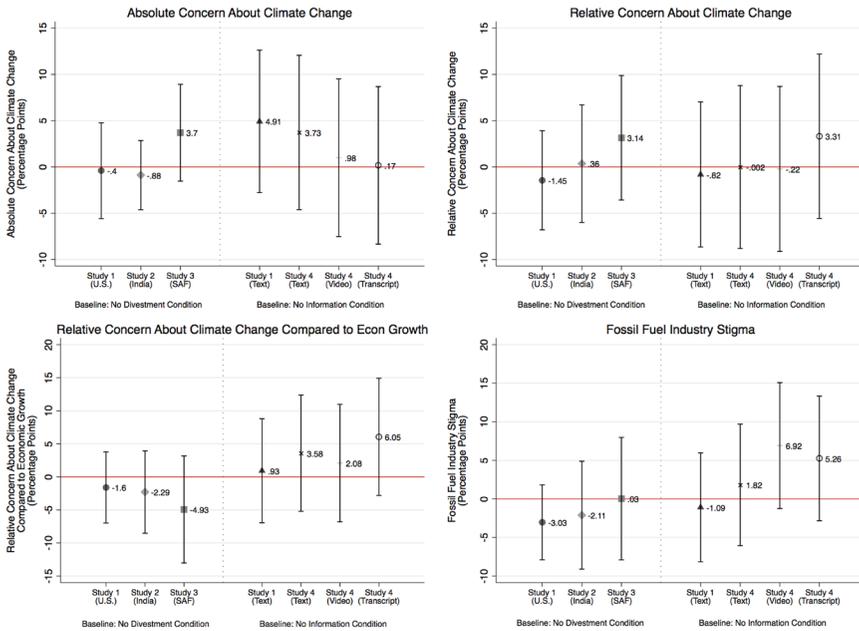


Figure 2. Mechanism analysis. Note: Error bars reflect 95% confidence intervals.

respondents about whether they believe divestment from fossil fuel companies is becoming more common. If our treatment was too weak for any of the above three reasons, then we would expect null results for this question (Kane and Barabas 2019). However, Figure 3 shows that respondents assigned to the divestment treatment generally *did* believe fossil fuel divestment was becoming more common. This suggests that our null result is not due to a weak treatment, but because respondents' climate change preferences are sticky.

Finally, in Table 3 we test our cost and diversity hypotheses by estimating interaction models for Studies 1–3. Per our theoretical expectations, divestment should have a greater impact on the public's policy preferences when the financial costs of divesting are higher and when a more diverse group of entities engage in divestment. We find no significant evidence for either hypothesis.

Conclusion

Divestment is a common strategy to achieve social change and the most prominent contemporary divestment movement is the campaign to divest from fossil fuel companies. However, despite the prevalence of divestment movements and the substantive importance of climate change as an issue,

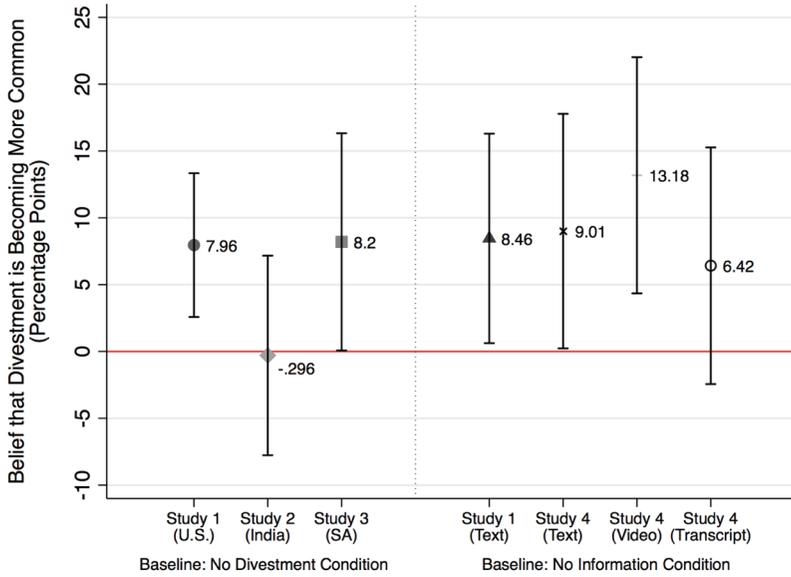


Figure 3. Beliefs about the prevalence of divestment. Note: Error bars reflect 95% confidence intervals.

Table 3. The financial costs of divestment and diversity of divestors.

	<i>Climate Change Policy Index</i>					
	Study 1 (1)	Study 1 (2)	Study 2 (3)	Study 2 (4)	Study 3 (5)	Study 4 (6)
Divestment Treatment x High Cost Treatment	0.0581 (0.0404)		0.0185 (0.0314)		0.0472 (0.0362)	
Divestment Treatment x High Diversity Treatment		0.0287 (0.0404)		-0.0020 (0.0314)		0.0386 (0.0362)
Divestment Treatment x High Cost Treatment	-0.0167 (0.0287)	-0.0020 (0.0291)	0.1100 (0.0225)	0.0213 (0.0220)	-0.0079 (0.0258)	-0.0036 (0.0251)
Divestment Treatment x High Diversity Treatment		-0.0042 (0.0283)	0.0053 (0.0231)		-0.0088 (0.0262)	
Constant	0.5828*** (0.0190)	0.5748*** (0.0194)	0.8251*** (0.0165)	0.8250*** (0.0158)	0.8002*** (0.0183)	0.8090*** (0.0176)
Observations	1344	1344	700	700	570	570

Notes: Standard errors in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.

little prior research systematically analyzes the impact of divestment on public beliefs and policy preferences. While testing all the different ways in which divestment might positively contribute to climate change mitigation efforts is beyond the scope of this project, we conduct experimental studies in three different countries and find surprisingly little evidence that exposure to information about divestment increases public support for policies that address climate change. Our findings therefore suggest that the fossil fuel

divestment movement may be less effective at changing policy preferences than the conventional wisdom suggests.

It is worth emphasizing the limitations of this study's research design, which should engender caution when drawing prescriptions from our results. There are other avenues beyond those tested in this study through which the divestment movement could affect public beliefs and preferences or have other positive impacts. First, our study focused on the impact of exposure to information about divestment *specifically* from a *single* source. However, divestment movements may generate discussion from multiple sources and on multiple domains in the real world. For example, from multiple news organizations, advocacy groups, and even by average citizens themselves on social media. Divestment movements may also expose members of the public to information that is not just narrowly focused on divestment specifically, but more broadly focused on substantive arguments about climate change. For example, what tangible impacts climate change will have if we do not take action to combat it. In this context, divestment campaigns could have a greater impact on public beliefs and preferences than our results suggest.¹⁴

Second, as previously discussed, exposure to information about divestment may move public beliefs and policy preferences to a greater extent if particularly popular organizations decide to divest. Additionally, when well-known name brand institutions divest, that may be more likely to lead to further discussion of climate change from multiple sources per the previous point. Third, for issue-areas where the public's views are less polarized and sticky than climate change (e.g., foreign policy), divestment movements may do more to move public beliefs and policy preferences. Fourth, divestment could still have a significant impact via financial mechanisms, even if its impact through public opinion mechanisms is limited.

Fifth, even if divestment movements do not move the public's policy preferences directly, they could still do so indirectly by inspiring new individuals to join social movements (Cheon and Urpelainen 2018, Hestres and Hopke 2020). Additional activists and organizers might then help facilitate other activities (e.g., mass protests) that have a bigger impact on aggregate public opinion than divestment. Sixth, the timing of when studies are conducted could potentially impact the results. For instance, perhaps if these studies were conducted during a period when environmental concerns were more salient relative to other issues (e.g., the COVID-19 pandemic), then exposure to information about divestment have had a bigger impact on the public's beliefs and policy preferences. Future research can explore treatment effect heterogeneity at different points in time. Seventh, even if the fossil fuel divestment movement does not significantly impact public beliefs and policy preferences, it could still impact the views of salient elites, such as investors. Eighth, although experiments offer significant advantages--most importantly, the ability to make credible causal inferences--they are not without weaknesses. In particular, they occur in artificial

environments that may not always be reflective of real-world scenarios. While this study suggests that divestment is not a panacea, future research should consider these alternative avenues through which divestment may have positive effects.

Notes

1. See <https://gofossilfree.org/divestment/commitments/>. Note that the number of institutions divesting and the total dollar value of assets controlled by divesting organizations was increasing both before and after our studies were fielded. Thus, the divestment movement remained quite salient when our studies were fielded.
2. See Ansar *et al.* (2013, pp. 43–48) for a review of these studies.
3. Identifying every possible belief that divestment movements can change would be unwieldy and is beyond the scope of this paper. Therefore, we focus on a handful of salient beliefs.
4. We thank an anonymous reviewer for raising this possibility.
5. See <https://gain.nd.edu/our-work/country-index/>.
6. Faith-based organizations also constituted a significant element of the South African divestment campaign.
7. The one significant difference being that we did not include a *no information* condition in this study due to resource constraints.
8. See page 105 of the Pew Report: https://www.pewforum.org/wp-content/uploads/sites/7/2021/06/PF_06.29.21_India_topline.pdf.
9. See <https://www.ipsos.com/en-za/where-do-support-political-parties-stand>.
10. See <https://www.iol.co.za/the-star/news/only-6-of-south-africans-have-university-degrees-report-says-8717cdd0-e701-474b-96f1-2377038b32df>.
11. Measures of Cronbach's Alpha show our index has high internal consistency.
12. Significant results do emerge if we subset on a *post-treatment* objective manipulation check, but prior research establishes that these estimates can be heavily biased (Aronow *et al.* 2019). Some significant results also emerge from Studies 2 and 4 when covariates are included (see the appendix), but these findings are substantively small (e.g., 0.07 points on a 5-point scale in Study 2).
13. As expected, we do find significant evidence that the video treatment is stronger than the transcript treatment, which demonstrates that the video treatment is a relatively easy test of our theory.
14. We thank an anonymous reviewer for suggesting this possibility.

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Data Availability Statement

Code and data to replicate all of the analyses in this paper can be found at: <https://doi.org/10.6084/m9.figshare.20326632>.

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