

# The burden of climate action: How environmental responsibility is impacted by socioeconomic status

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## ABSTRACT

As climate change increasingly wreaks havoc, sustainability is becoming a moral imperative. Yet, the strength of individuals' moral obligations to engage in sustainable actions may vary in accordance with their societal positions. In three studies (total  $N = 614$ ), we investigated how moral obligations vary as a function of socioeconomic status (SES). Participants evaluated their own and others' obligations to engage in sustainable behaviors through vignettes that varied the cost of these behaviors and the SES of the characters who were engaged in these behaviors. Results showed that perceived moral responsibility was diminished in cases when sustainability required monetary sacrifice, particularly when the people being evaluated were individuals of low SES. The increase in moral obligation associated with elevated SES of the characters in the vignettes was fully mediated by perceptions of greater affordability and by perceptions of greater culpability for contributing to climate change. However, we did not find strong evidence that participants' own SES had an effect on their judgments. Overall, rather than sustainability being considered a blanket obligation that is applicable across people and contexts, people typically ascribe more moral responsibility when sustainability is not financially burdensome.

## 1. Introduction

Combating the global crisis of climate change is experienced as being less urgent and more abstract than the immediate crises of meeting everyday needs, such as achieving food security, escaping violence, and paying rent. Prioritizing sustainability in one's life, therefore, is not consistently regarded as a moral imperative (Markowitz & Shariff, 2012). Instead, it is sometimes portrayed as a "luxury problem" (Ericson et al., 2014), exclusively suitable for those who have time to worry about it. In some ways, environmental concern is an elitist activity, as many behaviors commonly thought of as "environmentally friendly" are not financially accessible to people of low socioeconomic status (SES) (Gibson-Wood & Wakefield, 2013; Massey, 2004). For example, buying local produce or switching to more efficient forms of energy consumption depend on the ability to pay, the ability to find such resources, exposure to relevant information, and cultural acceptability (Gibson-Wood & Wakefield, 2013). These barriers are often left unaddressed in environmental campaigns, yet they are key indicators for determining who should practically bear the onus of combating climate change.

Dismissing sustainability as a luxury problem, however, carries the risk of ignoring the disproportionate causes and effects of environmental degradation across social strata. People with more wealth disproportionately contribute to climate change; indeed, a person's environmental impact is more accurately predicted by their income level than by their self-assessed identity as "pro-environmental" (Moser & Klein-hückelkotten, 2017; Otto et al., 2016). In the United States, affluence is strongly associated with increased per capita carbon footprints: wealthier individuals' footprints are around 25% higher than those of lower income individuals, and some wealthier neighborhoods have emissions levels that are 15 times higher than less wealthy surrounding areas (Goldstein et al., 2020). Conversely, people who lack wealth are disproportionately vulnerable to the effects of climate change (Swim & Bloodheart, 2018).

Humans have already saturated the atmosphere with so much CO<sub>2</sub> that concentrations are higher than at any point in at least 2 million years, contributing to a 1° Celsius rise in global surface temperature since the late 19th century and a fourfold increase in the rate of ice sheet melt in the last 20–30 years (Intergovernmental Panel on Climate

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Change, 2021). Anthropogenic climate change will continue to exacerbate gaps in wealth and quality of life between nations and individuals by altering the availability of natural resources, increasing forced displacement of people, slowing down economic growth, and making poverty reduction more difficult (Intergovernmental Panel on Climate Change, 2014). For example, scientists predict an increase in extreme heat events (beyond already recorded increases since the 1950s), leading to more agricultural droughts, which undermine food security and escalate conflict. Countries without the proper infrastructure to cope with increased resource scarcity and more frequent natural disasters are at a significant disadvantage, and the social, economic, and cultural factors that contribute to an economy's ability to support such infrastructure have not been adequately considered in climate change discourse. Historically wealthier nations are by far the leaders in greenhouse gas emissions but are least likely to feel their impacts. Although signers of the Paris Agreements have committed to mitigation and adaptation strategies to reduce emissions, scientists concur that the proposed efforts are insufficient to alter our global warming trajectory (Intergovernmental Panel on Climate Change, 2021). Past research suggests that representatives of wealthier countries are not prepared to accept responsibility through international climate policy or other means (Lange et al., 2007; Murali et al., 2021). In a survey of agents involved in international climate policy negotiations, it was found that representatives from countries with relatively higher per capita GDP and greater CO<sub>2</sub> emissions did not consider equity issues as important and were relatively less in favor of policies equating financial obligation with percentage of emissions or global GDP (Lange et al., 2007). However, some research suggests that this pattern may not hold true for individual constituents (Svenningsen, 2019).

In a recognition that environmentalism is a social justice issue, the present research embraces an environmental justice perspective and examines individuals' perceived obligations to act sustainably as a function of their socioeconomic identity. Pope Francis adopted a similar perspective in his 2015 *Laudato Si*, an influential call to action. The Pope advocated for immediate action to mitigate the effects of climate change on the basis that the foundation of civil society itself is the mutual responsibility that humans have for each other. However, he acknowledged that some people are in a better position to enact change than others; not only are people of low SES disproportionately vulnerable to environmental hazards, they are also limited in terms of the sustainable behaviors in which they have the ability to engage (Francis, 2015). Responsibility with regard to climate change, he argued, is therefore differentiated. This may seem logical and intuitive to some, but is it a collectively held understanding?

### 1.1. Socioeconomic status and sustainability

Given their more abundant resources and purchasing options that allow for environmentally conscious decisions and actions, as well as having (on average) lifestyles that produce outsized levels of greenhouse gas emissions (Kenner, 2015; Semenza et al., 2008), are privileged members of society perceived by themselves and others to have a greater moral obligation than less privileged members of society for engaging in sustainable behaviors?

Some research has indicated that SES is positively associated with the willingness to make behavioral sacrifices in order to protect the environment (Sulemana et al., 2016). This pattern may not always be clear-cut, however, particularly in the domain of moral judgment. Despite wealthier individuals having larger carbon footprints and having the financial ability to adapt to most immediate threats that are posed by climate change, it is possible that they are motivated to avoid perceiving themselves as holding a greater burden. People from high SES backgrounds may eschew environmental responsibility by using narrow definitions of climate change and redirecting their attention to other problems (Swim & Bloodheart, 2018), or by virtue of the physical, psychological, and temporal disconnects between their actions and the

effects of climate change (Markowitz & Shariff, 2012; Spence et al., 2011). Indeed, richer individuals have a relatively lower tendency to consider climate change as posing imminent threat (Fielding et al., 2020; Stokes et al., 2015). Individuals of high SES also exhibit relatively lower levels of compassion (Stellar et al., 2012) and prosociality (Piff et al., 2010), suggesting that individuals of higher SES levels may be more morally detached.

Conversely, people of low SES are increasingly confronted with the effects of climate change, despite having relatively small carbon footprints. Historically oppressed and marginalized communities in the U.S. are subjected to more environmental threats, while also having fewer resources to avoid or cope with these threats (Agyeman et al., 2016; Denchak, 2018; Di Chiro, 1996). Given that low-SES individuals are often victims of climate change, it is possible that they are regarded by themselves and others as having fewer obligations to mitigate its causes. However, given that lower-income individuals are more directly exposed to the effects of climate change, they may perceive others to have greater obligations to act sustainably. Perhaps driven by their disparate experiences with environmental harms, people who are non-White and have low incomes tend to have a broader understanding of what constitutes an "environmental" problem, such that they are more likely to extend this category to traditionally social and public health issues (Song et al., 2020). This wider understanding of the threats posed by climate change may contribute to an increased perception of sustainable obligations.

### 1.2. The present research

In this paper, we investigate the role of socioeconomic paucity in mitigating moral responsibilities for acting sustainably. We measured perceptions of moral obligation because decisions to engage in sustainable behavior are heavily influenced by personal moral commitments (e.g., Stern et al., 1999; Van Liere & Dunlap, 1978). However, most research on moral evaluations has neglected any consideration of the identity of participants or targets (Hester & Gray, 2020). As a symptom of this tendency, previous research on moral judgments of sustainable behavior has not considered the relevance of socioeconomic status. Thus, a number of open questions remain, which we addressed in the present research: Are people with greater financial means perceived to have correspondingly strong moral obligations to act sustainably? How does the socioeconomic status of the person who is rendering a judgment impact their perceptions of these obligations? How do these judgments differ when acting sustainably requires spending money?

To shed light on answers to these questions, we recruited participants from low SES and high SES backgrounds and asked them to evaluate the moral obligations of target characters who were contemplating sustainable actions. These target characters were described as being from either a low SES background or a high SES background, and the sustainable actions were either costly or involved minimal costs. By considering the relevance of each of these three factors (Participant SES, Target SES, and Cost), we were able to gain a nuanced understanding of how SES contributes to moral responsibility for engaging in environmentally friendly actions.

Our primary aim was to examine the effect of Target SES, as multiple converging reasons led us to expect that people of high SES would be attributed with greater obligations to act sustainably. Specifically, wealthier individuals disproportionately contribute to climate change, while also having more resources to contribute to sustainable causes. In addition, income level has been found to impact moral judgments of consumer decisions (Olson et al., 2016), such that we expected this information to be considered relevant by participants.

We also expected that moral obligations would scale with the degree to which actions were affordable. This is predicted by findings that judgments of moral obligation are sometimes influenced by people's abilities to fulfill these obligations (Semler & Henne, 2019), as well as by findings that people have reduced intentions to engage in sustainable

behaviors when they are costly (Zhao et al., 2016). This led us to hypothesize a main effect of Cost, with costlier actions yielding less moral responsibility overall. Additionally, we hypothesized an interaction of Cost and Target SES, with costlier actions yielding more pronounced reductions in moral responsibility for individuals of lower SES, given the disproportionately higher burden associated with their engagement in these actions.

Given the competing considerations discussed above, we were unsure whether individuals of higher SES would attribute relatively heightened or reduced moral obligations as compared to individuals of lower SES, and thus we did not have strong predictions about whether we would uncover a main effect of Participant SES.

If participants of all social strata agree on the relevant criteria for attributing others with the obligation to engage in sustainable actions, and if they make judgments that are relatively immune to self-interest, there should be no interaction between Target SES and Participant SES, and no three-way interaction between these variables and Cost. The presence of an interaction between these variables could suggest that additional relevant factors are at play in the assignment of moral responsibility. For example, one likely possibility would be that motivated cognition—a biased form of reasoning in which people tend to make inferences and evaluations that are optimally self-serving rather than accurate or impartial (Kunda, 1990)—would lead different participants to make different patterns of judgment, particularly for costly actions. In line with this idea, we hypothesized that participants of high SES would be less likely than participants of low SES to judge targets of higher SES as having a relatively greater responsibility to act sustainably (particularly for High Cost scenarios), given that high SES participants have more at stake in making this sort of evaluation. This hypothesis is supported by findings that people's judgments of others' donations to charity are reference dependent and that people of higher income are expected to give more by people of lower incomes than they themselves believe they should (Berman et al., 2020).

We tested these hypotheses across three web-based experiments. Study 1 provided an initial examination of how people perceive others' responsibilities to act sustainably based on their own and others' socioeconomic statuses, as well as the cost of the actions being evaluated. Study 2 built on these findings but instead asked participants to imagine themselves at different socioeconomic statuses. Study 3 investigated the mechanisms underlying the findings of the first two studies, and additionally included a behavioral task to investigate whether participants from different SES levels would be more likely to donate money to an environmental charity. All studies were approved by the Franklin & Marshall College Institutional Review Board (Protocol Numbers: R\_2fJcJXdBqtKwogC and R\_3NPObq2MXAnnBSn).

## 2. Study 1

In Study 1, American participants of high or low SES were presented with short, realistic vignettes describing people of both high and low SES. They were asked to evaluate the extent to which these target characters were morally obliged to engage in a range of sustainable actions, half of which required a clear financial cost.

### 2.1. Method

#### 2.1.1. Participants

A target sample size of 70 participants (after excluding participants at an anticipated rate of approximately 15%) was determined by an *a priori* power analysis (see our pre-registration at <https://osf.io/cmvja> for details). All participants were native English speakers from the United States of America who were recruited via Prolific. We aimed to recruit 43 participants of low SES backgrounds and 43 participants from high SES backgrounds. Participants' SES backgrounds were obtained from previous self-classifications made on Prolific. Specifically, Prolific asks participants to place themselves on a socioeconomic ladder, with the

highest rung (10) being the best off, so we recruited participants who indicated an SES of 1, 2, or 3 for the Low SES condition and 7, 8, 9, or 10 for the High SES condition (the latter range was slightly larger given the dearth of very high SES participants on Prolific). We ended up with a total sample of 87 participants and excluded 18 participants who failed one of two attention checks ( $n = 7$ ) or who indicated an SES level within the study that did not align with their prior indication on Prolific ( $n = 11$ ), resulting in a final sample of 69 useable participants ( $M_{\text{age}} = 40$ ,  $SD_{\text{age}} = 14$ ; 45% female, 54% male, 1% non-binary or N/A; 81% White, 7% Black or African American, 4% Asian, 3% Hispanic/Latino, 4% other or multiracial). The attention checks consisted of one question asking participants to describe a scenario from the study and one question asking them to honestly indicate if they paid attention while participating.

#### 2.1.2. Materials and procedure

High SES ( $n = 33$ ) and Low SES ( $n = 36$ ) participants were each presented with eight vignettes about different people and asked to rate how morally obligated each person was to engage in a specific activity. These vignettes varied in accordance with a 2 (socioeconomic status of target character: High-SES Target vs. Low-SES Target)  $\times$  2 (cost of sustainable decision: High Cost vs. Low Cost) design, with two vignettes per cell. Answers were rated on a five-point Likert scale (1 = Not at all obligated, 5 = Extremely obligated). See Table 1 for example vignettes and questions. The names, background information, SES level, gender, and actions presented in the vignettes were all randomized.

In half of the vignettes, target individuals were described as having advanced degrees, high-powered jobs, and/or living in safe neighborhoods, thus implying a high socioeconomic status. In the other half of vignettes, target individuals were described as lacking these privileges, thus implying a low socioeconomic status. Additional, irrelevant details (e.g., hair color, hobbies) were also included to reduce demand characteristics. Orthogonally, in half of the vignettes, the proposed action clearly required spending additional money, and in the other half, the

**Table 1**  
Example Vignettes used in Study 1.

	Target SES	
	Low SES	High SES
High Cost	Cameron has brown hair and is a talented artist. Cameron works two jobs and lives in a neighborhood with a high crime rate. Since Cameron lives in such a sunny area, a solar company representative has reached out to Cameron about installing solar panels on his roof. How morally obligated is Cameron to install solar panels?	Alex is 53 years old and enjoys playing board games with her family. Alex works as the CEO of a bank and lives in a gated community. Alex regularly sees food with organic labels and clothing brands that use sustainably sourced materials, and so Alex considers buying more organic and sustainable products. How morally obligated is Alex to buy organic food and shop at sustainable clothing brands?
Low Cost	Riley is 70 years old and was thrown a surprise birthday party this year. Neither of Riley's parents went to college and both are immigrants. On the way to work each day, Riley passes a billboard that explains how the area is experiencing a severe drought. How morally obligated is Riley to try to take shorter showers?	Taylor likes to splash in puddles after rainstorms and whistle while walking. Both of Taylor's parents went to college and have Master's degrees. Before voting in local elections, Taylor likes to understand each candidate's views. How morally obligated is Taylor to consider a candidate's environmental platform when choosing who to vote for?

action did not clearly cost money.<sup>2</sup> Neither socioeconomic status nor cost were directly mentioned but were rather implicit in the descriptions, in order to obscure the nature of the manipulations and to make the descriptions more naturalistic. To ensure that participants were aware that purchasing a hybrid car is generally more costly than purchasing a non-hybrid car, participants were asked to compare the relative expense of these two cars after the vignettes.<sup>3</sup>

At the end of the study session, participants were asked a series of demographic questions. The most crucial of these involved SES and was used to ensure the accuracy of Prolific's classification of participants into high or low SES groups. This question was taken from the MacArthur Scale of Subjective Social Status (Adler et al., 2000). Participants were presented with a picture of a ladder with ten rungs and asked to select which rung best represented their standing in society, with 1 being the lowest (least money, least education, and worst jobs or no job) and 10 being the highest (most money, most education, best jobs). Finally, participants were asked the two attention check questions.

## 2.2. Results

Responses were aggregated across each pair of vignettes. A visualization of the results is presented in Fig. 1.

A three-way ANOVA was conducted to examine the effects of Target SES, Cost, and Participant SES on perceived moral obligation. There were large, statistically significant main effects of Target SES,  $F(1, 67) = 13.98, p < .001, \eta_p^2 = 0.17$ , and Cost,  $F(1, 67) = 111.18, p < .001, \eta_p^2 = 0.62$ , indicating that participants judged Low SES targets as having less obligation overall and that all targets, regardless of SES, were judged as having less obligation when there was a High Cost involved. There was also a medium-sized main effect of Participant SES,  $F(1, 67) = 4.09, p = .047, \eta_p^2 = 0.06$ , which indicated that Low SES participants tended to ascribe more moral obligation than High SES participants, across conditions.

There was a large two-way interaction between Target SES and Cost,  $F(1, 67) = 19.52, p < .001, \eta_p^2 = 0.23$ , suggesting that participants differentially judged moral obligation depending on the target's SES and whether or not the proposed action incurred a clear financial cost. For the Low Cost vignettes, participants judged Low SES targets ( $M = 2.82, SD = 1.09$ ) and High SES targets ( $M = 2.88, SD = 1.06$ ) as having very similar levels of moral obligation to engage in sustainable actions. For the vignettes which involved a High Cost, however, participants judged Low SES targets ( $M = 1.61, SD = 0.68$ ) as having a substantially reduced moral obligation as compared to High SES targets ( $M = 2.38, SD = 1.24$ ).

There was not a significant interaction between Participant SES and Cost,  $F(1, 67) = 0.05, p = .831, \eta_p^2 = 0.00$ , or between Participant SES and Target SES,  $F(1, 67) = 1.22, p = .272, \eta_p^2 = 0.02$ . These results indicate that High SES participants and Low SES participants were similarly impacted by information about cost and the SES of the target characters. There was also not a significant interaction between Target SES, Cost, and Participant SES,  $F(1, 67) = 2.40, p = .126, \eta_p^2 = 0.03$ . Thus, we did not find evidence that High SES participants were motivated to downplay the moral obligations of High SES targets, even for costly scenarios. However, there was a non-significant trend suggesting that, for costly scenarios, High SES participants were slightly more likely than Low SES participants to judge High SES targets as having less moral obligation.

## 2.3. Discussion

The results of Study 1 suggest that, when sustainable behaviors do not involve a financial sacrifice, people of both high and low SES backgrounds are considered to be moderately obligated to engage in these behaviors. However, when sustainable behaviors cost money, these moral obligations are reduced, primarily for people of low SES. These patterns of evaluation are evident across individuals of both low SES and high SES, although people of low SES tend to ascribe more obligation overall. Thus, these results support the hypothesis that a financial burden lessens obligations to engage in sustainable actions. If (and only if) sustainability comes at a cost, people of low SES are judged to be less morally responsible for acting sustainably.

Much more tentatively, we found a non-significant trend for High SES participants to express relatively lower attributions of responsibility for High SES targets to engage in costly sustainable behaviors, which may hint at a role for motivated cognition (Kunda, 1990). In other words, High SES participants may have been motivated to downplay the obligations of people at their SES levels when evaluating costly behaviors, thus justifying the potential for low levels of sustainability in their own lives. However, it is unclear whether this was an illusory trend toward a three-way interaction or a true result that we were underpowered to detect.

## 3. Study 2

Study 2 served as a conceptual replication of Study 1, but with a slightly more personal framing. Instead of focusing on evaluations of strangers' obligations to act sustainably, Study 2 explored whether people would judge themselves as having more or less of an obligation to act sustainably if they were of a different social status. This change in framing was inspired by recent research indicating that obligations to donate to charity are reference-dependent on one's own economic position: In hypothetical scenarios, people estimated that they would have more money to spare and therefore would have larger donation standards at higher incomes than actual higher earners themselves believed (Berman et al., 2020). Shifting from judgments of others to judgments of the self (in diverse socioeconomic scenarios) also decreased the extent that participants were required to imagine fictional characters. This additionally increased the salience of participants' current SES, as participants were more likely to draw comparisons with their current situations and thus form reference-dependent judgments.

We asked participants of both high and low SES to imagine themselves at 10 different levels of SES and to judge how morally obligated they were to engage in sustainable actions at each socioeconomic level. Whereas participants in Study 1 were presented with all vignette types, participants in Study 2 were assigned to read either High Cost or Low Cost vignettes. By employing a between-subjects design for this variable, we reduced the possibility that being exposed to both Cost conditions influenced participants' judgments of obligation, especially if they noticed the discrepancy.

Study 2 allowed us to further examine a non-significant trend that emerged in Study 1, which suggested that participants of high SES were less likely than those of low SES to judge others of high SES as having strong moral obligations when it cost money to be sustainable, hinting at an influence of motivated cognition. In addition to testing for the presence of this three-way interaction, the use of first-person scenarios in Study 2 also allowed us to examine the relationship between participants' reported SES levels and the obligations they perceived when imagining themselves at these actual SES levels. The strength and directionality of the correlation between Participant SES levels and judgments of moral obligation at these SES levels would indicate the degree to which motivated cognition drives judgments of obligations to be sustainable. Specifically, a null or negative correlation would indicate that people of higher SES are motivated to downplay their own moral obligations, whereas a positive correlation would indicate that even

<sup>2</sup> The Cost manipulation was primarily conceived as a manipulation of financial burdens, rather than time burdens or other less tangible sacrifices.

<sup>3</sup> This was confirmed; the majority of participants appreciated that hybrid cars are more expensive, with only one participant expressing a belief that hybrid cars are less expensive.



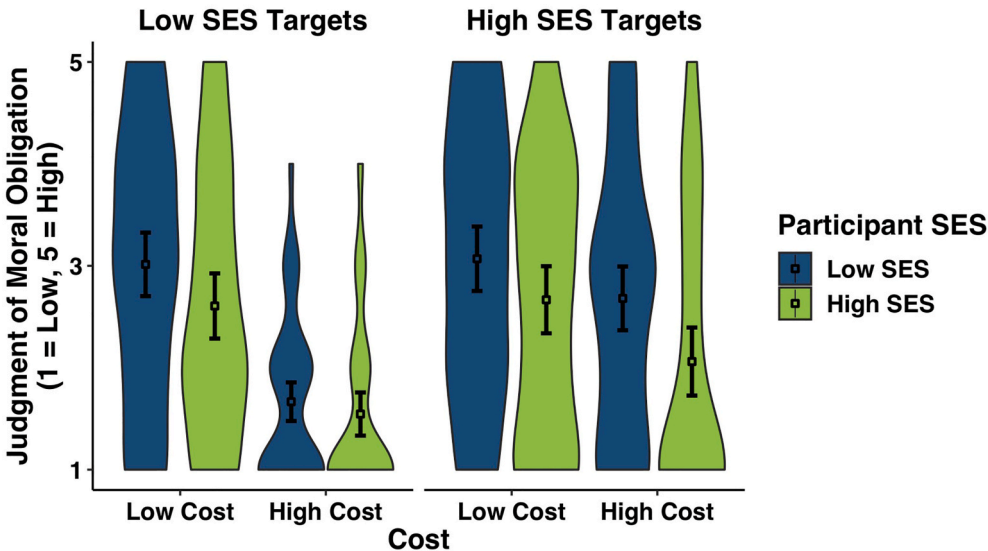


Fig. 1. Violin plots representing probability densities for moral obligation ratings in Study 1. Note. Means are represented by open squares. Error bars indicate 95% confidence intervals.

people who are themselves of high SES regard others of high SES as being more obligated to engage in environmentally friendly behaviors.

3.1. Method

3.1.1. Participants

Participants were recruited through Prolific based on the same criteria as in Study 1. Because Study 1 hinted at a three-way interaction, we approximately doubled the sample size in Study 2 to increase our power for detecting this effect. We aimed to recruit 17 participants from each of 10 levels of SES (as determined by their previous self-indications on Prolific), for a total sample size of 170 before exclusions and a useable sample size of approximately 140 after exclusions (see our pre-registration at <https://osf.io/sjwhc> for details). We ended up with a total sample of 168 participants. Thirty-seven participants were excluded for failing one of the two attention checks ( $n = 12$ ), for indicating an SES level within the study that did not match our categorization of the participant into a Low SES or High SES group based on their prior self-classification on Prolific ( $n = 24$ ), or for having an IP address that matched that of another participant ( $n = 1$ ). This resulted in a final sample of 131 participants ( $M_{age} = 37$ ,  $SD_{age} = 14$ ; 53% female, 45% male, 2% non-binary or N/A; 73% White, 8% Black or African American, 2% American Indian or Alaskan Native, 9% Asian, 4% Hispanic/Latino, 4% other or multiracial).

3.1.2. Materials and procedure

This study again manipulated Target SES (imagined socioeconomic status in vignette: High SES vs. Low SES) and Cost (High Cost vs. Low Cost). To create the different SES scenarios, the ladder analogy used in Study 1 was translated into 10 distinct descriptions, developed by accumulating information about SES indicators from different sources (Berzofsky et al., 2014; Cowan et al., 2012; Daly et al., 2002; The National Statistics Socio-Economic Classification, 2007). Differently from Study 1, the ladder analogy was not presented to participants in Study 2, in favor of a more detailed description of these 10 SES percentile groups.

Participants were presented with the scenarios one at a time and in random order. Each scenario asked participants to imagine themselves at a different social status, such that all participants were exposed to all 10 SES levels. For example, the scenario depicting the lowest SES level read, “Imagine that you wake up one day and find yourself in the bottom 10% of society. You are unemployed and living with your partner and 2 children on the street. Just like your parents, you did not finish high

school” (see Table 2 for the full text of all 10 scenarios).

After reading each scenario, participants in the High Cost condition ( $n = 65$ ) were asked how morally obligated they were to donate to environmentally conscious charities, to buy organic food and clothing,

Table 2  
Scenarios given to participants depicting 10 different levels of SES, ordered from low to high.

Imagine that you wake up one day and find yourself in the <b>bottom 10% of society</b> . You are unemployed and living with your partner and 2 children on the street. Just like your parents, you did not finish high school.
Imagine that you wake up one day and find yourself in the <b>bottom 20% of society</b> . You scrape together a barely-livable wage through various temporary jobs and live with your partner and 2 children in government-provided housing. You did not finish high school, but your mom did.
Imagine that you wake up one day and find yourself in the <b>bottom 30% of society</b> . You work as a dishwasher and live with your partner and 2 children in a rented one-bedroom apartment. Your overall household income is \$30,000 per year. Your highest degree is a high school diploma and your dad has finished some college.
Imagine that you wake up one day and find yourself in the <b>bottom 40% of society</b> . You work as a bus driver and live with your partner and 2 children in a rented three-bedroom apartment. Your overall household income is \$40,000 per year. Your highest degree is a high school diploma and your mom has an associate's degree.
Imagine that you wake up one day and find yourself in the <b>bottom 50% of society</b> . You work as a janitor and live with your partner and 2 children in a studio apartment that you own. Your overall household income is \$50,000 per year. You and your parents have all finished some college.
Imagine that you wake up one day and find yourself in the <b>top 50% of society</b> . You work as a retail salesperson and live with your partner and 2 children in a two-bedroom apartment that you own. Your overall household income is \$65,000 per year. You and your parents all have associate's degrees.
Imagine that you wake up one day and find yourself in the <b>top 40% of society</b> . You work as a real estate agent and live with your partner and 2 children in a four-bedroom house that you own. Your overall household income is \$80,000 per year. You have a bachelor's degree and your mom also has a bachelor's degree.
Imagine that you wake up one day and find yourself in the <b>top 30% of society</b> . You work as a registered nurse and live with your partner and 2 children in a five-bedroom house that you own. Your overall household income is \$100,000 per year. You and your parents all have bachelor's degrees.
Imagine that you wake up one day and find yourself in the <b>top 20% of society</b> . You work as a pediatrician and live with your partner and 2 children in one of two six-bedroom houses that you own. Your overall household income is \$300,000 per year. You have a doctor of medicine degree (MD), your mom has a master's degree, and your dad has a bachelor's degree.
Imagine that you wake up one day and find yourself in the <b>top 10% of society</b> . You work as the CEO of a bank and live with your partner and 2 children in one of four houses that you own. Your overall household income is \$2,000,000 per year. You and your parents all have graduate degrees.

and to drive a low-emission vehicle. Participants in the Low Cost condition ( $n = 66$ ) were asked how morally obligated they were to take short showers, to reuse jars and containers, and to consider candidates' environmental platforms when making voting decisions. There were approximately equal numbers of participants in each of the four cells (High Participant SES/Low Cost:  $n = 35$ ; High Participant SES/High Cost:  $n = 33$ ; Low Participant SES/Low Cost:  $n = 31$ ; Low Participant SES/High Cost:  $n = 32$ ).

As in the previous study, answers were rated on a five-point Likert scale (1 = Not at all obligated, 5 = Extremely obligated). After seeing all scenarios, participants were asked to indicate which most closely represented their life and were then presented with a series of demographic questions. Attention checks at the end of the study asked participants to briefly describe one of the scenarios they read and to indicate whether or not they paid attention.

### 3.2. Results

Responses were aggregated across each set of five scenarios. Participants were divided into High SES ( $n = 68$ ) and Low SES ( $n = 63$ ) groups rather than using the ten fine-grained levels by which they were recruited, in order to maintain consistency with the previous study and to simplify the analyses.<sup>4</sup> A visualization of the results is presented in Fig. 2.

A three-way ANOVA was conducted to examine the effects of Target SES, Cost, and Participant SES on perceived moral obligation. Results were similar to those of Study 1. There was a large and statistically significant main effect of Target SES,  $F(1, 127) = 90.88$ ,  $p < .001$ ,  $\eta_p^2 = 0.42$ , indicating that overall, participants judged themselves as having less obligation when imagining themselves in Low SES scenarios than in High SES scenarios. There was also a large main effect of Cost,  $F(1, 127) = 34.22$ ,  $p < .001$ ,  $\eta_p^2 = 0.21$ , indicating that participants judged themselves as having less obligation when the actions incurred a cost than when they didn't. Contrary to Study 1, there was no main effect of Participant SES,  $F(1, 127) = 0.56$ ,  $p = .457$ ,  $\eta_p^2 = 0.00$ , meaning that there was not a difference in the general judgments of High SES and Low SES participants.

There was a strong two-way interaction between Target SES and Cost,  $F(1, 127) = 92.52$ ,  $p < .001$ ,  $\eta_p^2 = 0.42$ , suggesting that participants judged their own moral obligation as significantly lower in Low SES scenarios than in High SES scenarios when there was a cost involved. Participants in the Low Cost condition judged themselves as having a relatively equal level of obligation to act sustainably across the Low SES scenarios ( $M = 3.26$ ,  $SD = 1.17$ ) and the High SES scenarios ( $M = 3.26$ ,  $SD = 1.15$ ). Participants in the High Cost condition judged themselves as having only half as much of an obligation to act sustainably when they imagined themselves in Low SES scenarios ( $M = 1.48$ ,  $SD = 0.67$ ) as compared to when they imagined themselves in High SES scenarios ( $M = 3.08$ ,  $SD = 1.20$ ).

There was no significant interaction between Participant SES and Cost,  $F(1, 127) = 0.14$ ,  $p = .710$ ,  $\eta_p^2 = 0.00$ , or between Participant SES and Target SES,  $F(1, 127) = 0.02$ ,  $p = .903$ ,  $\eta_p^2 = 0.00$ . There was, however, a small but significant three-way interaction between Target SES, Cost, and Participant SES,  $F(1, 127) = 5.93$ ,  $p = .016$ ,  $\eta_p^2 = 0.04$ . This was driven by High SES participants attributing relatively greater obligations to High SES targets only when Cost was low, whereas Low SES participants attributed relatively greater obligations to High SES targets when Cost was high, and also relatively greater obligations to Low SES targets when Cost was low. This is consistent with an interpretation that participants were motivated to avoid assigning greater responsibility to imagined versions of themselves that approximated their actual socioeconomic status.

<sup>4</sup> Analyzing the results by each SES level did not provide significant additional information and so will not be discussed further in this paper.

A Spearman's correlation test was run to examine the more fine-grained relationship between Participant SES Decile (i.e., relative standing in one of ten percentile ranges) and judgments of moral obligation at that same decile. A significant positive correlation was found,  $r(129) = 0.34$ ,  $p < .001$ , indicating that High SES participants judged themselves to have more of an obligation when presented with a scenario that reflected their own SES than Low SES participants did in scenarios that reflected their own SES. Thus, this analysis did not uncover compelling evidence of motivated cognition amongst High SES participants.

### 3.3. Discussion

The results of Study 2 largely replicated the findings in Study 1, with the exception that Low SES participants did not perceive greater overall moral obligations toward sustainability. These results therefore indicated that a person's actual SES did not meaningfully affect their judgments of moral obligations to act sustainably at different SES levels. However, imagined SES levels and monetary costs of behaviors each exerted a considerable impact on evaluations of moral responsibility. Specifically, moral obligations were elevated for sustainable actions that did not require a financial sacrifice, primarily when individuals imagined themselves as existing at lower social strata. People judged themselves as having a drastically reduced obligation to act sustainably in the Low SES scenarios (but not in the High SES scenarios) when there was a cost to being sustainable. When actions were not costly, there was no difference between judgments of obligation at different SES levels.

We again found only tentative evidence to support our prediction that motivated cognition would drive High SES participants to judge High SES versions of themselves as having reduced obligations. This hypothesis received modest support from a small three-way interaction, which suggested a slight tendency for participants to somewhat downplay their own moral obligations for costly behaviors. This pattern contrasts with a Spearman's correlation which indicated that participants of higher SES judged themselves as having higher moral obligations at their current SES than participants of lower SES judged themselves to have at their current SES, thus repudiating a motivated cognition account. However, there was one intriguing difference between Studies 1 and 2 that might hint at some degree of motivated cognition, in the form of hypocrite. Specifically, hypocrite can help to explain the finding that Low SES participants ceased to hold High SES targets to a higher standard than their High SES counterparts when these targets were imagined versions of themselves (Study 2) as compared to when these targets were strangers (Study 1), suggesting that identification with a higher social status can attenuate tendencies to attribute elevated moral obligations.

## 4. Study 3

Past research has shown that ascribing moral value to the environment is partially a reflection of how much people recognize the negative environmental effects of their actions (Van Lieke & Dunlap, 1978). Thus, people who have larger carbon footprints may be judged as having greater obligations to act sustainably. To the extent that people recognize that individuals of higher SES contribute more to climate change than individuals of lower SES, this may explain the increase in moral obligations attributed to High SES targets in Studies 1 and 2. Additionally, increases in moral obligations could have stemmed from knowledge that High SES targets are better able to afford a sustainable lifestyle. In order to assess whether participants were making judgments of moral obligation based on beliefs about the characters' culpability for contributing to climate change or the degree to which the sustainable actions were affordable to them, we conducted a final study in which we measured how assessments of culpability and affordability contribute to beliefs about moral obligation.

In Study 3, we also examined whether participants of higher SES

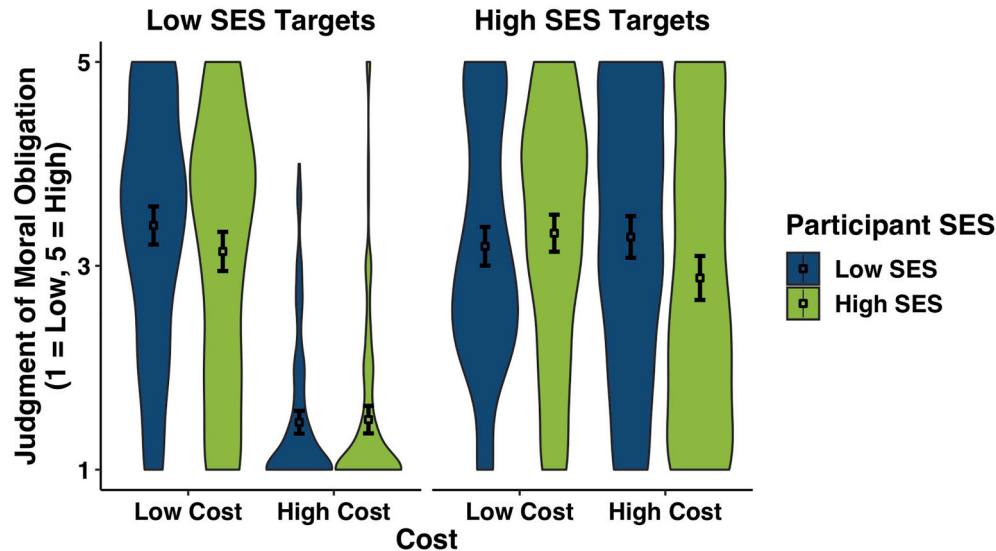


Fig. 2. Violin plots representing probability densities for moral obligation ratings in Study 2. Note. Means are represented by open squares. Error bars indicate 95% confidence intervals.

actually felt a relatively greater obligation to act sustainably, as they professed in Study 2. To accomplish this, we offered all participants a 10-cent bonus at the end of the survey and asked if they would be willing to donate a portion or all of it to an environmental charity. This question allowed us to measure whether participants who self-identified as being of a higher SES were willing to act in accordance with their beliefs. Finally, to address the possibility that the within-subjects manipulation of Target SES influenced participant answers in the previous studies, we employed a fully between-subjects design in Study 3. Otherwise, the survey and procedure were identical to Study 1.

4.1. Method

4.1.1. Participants

A target sample size of 500 participants (after excluding participants at an anticipated rate of approximately 15%) was determined by an *a priori* power analysis (see our pre-registration at <https://osf.io/xjrb7> for details). All participants were again native English speakers from the United States of America who were recruited via Prolific. We aimed to recruit 250 participants of low SES backgrounds (with self-ascribed ratings of 1, 2, or 3 on a 1–10 SES ladder) and 250 participants from high SES backgrounds (with self-ascribed ratings of 8, 9, or 10 on a 1–10 SES ladder), as previously assessed on a Prolific screening questionnaire. We ended up with a total sample of 501 participants and excluded 87 participants who failed one of two attention checks ( $n = 8$ ) or who indicated an SES level within the study that did not align with their prior

indication on Prolific ( $n = 77$ ), as well as one response with an IP address that matched that of another participant and one response from a participant who reported being a non-native English speaker. This resulted in a final sample of 414 useable participants (216 High SES, 198 Low SES;  $M_{age} = 38$  years,  $SD_{age} = 14$  years; 47% female, 52% male, 1% non-binary or N/A; 77% White, 4% Black or African American, 8% Asian, 5% Hispanic/Latino, 4% other or multiracial).

4.1.2. Materials and procedure

We employed a 2 (socioeconomic status of protagonist in vignette: High SES vs. Low SES)  $\times$  2 (cost of sustainable decision: High Cost vs. Low Cost) between-subjects design, for both High SES participants and Low SES participants. There were between 44 and 59 participants in each of the eight cells.

All participants were presented with 4 vignettes of different people (see Table 3) and were asked to rate how morally obligated each person was to engage in a particular sustainable action, how much the person's lifestyle contributes to climate change (e.g., "Given what you know about Taylor, how much does Taylor's lifestyle contribute to climate change?"), and how affordable the specific activity would be for the person (e.g., "Given what you know, would installing solar panels be affordable for Jamie?"). All ratings were made on five-point Likert scales.

At the end of the study session, in addition to the same demographic questions included in the previous studies, participants were asked how much, if any, of a 10-cent bonus they would like to donate to the Clean

Table 3  
Example Vignettes used in Study 3.

	Target SES	
	Low SES	High SES
High Cost	Sam is 53 years old and enjoys playing board games with family members. Sam works two jobs and lives in a neighborhood with a high crime rate. Sam regularly sees foods with organic labels and clothing brands that use sustainably sourced materials, and so Sam considers buying more organic and sustainable products.	Jamie is 70 years old and was thrown a surprise birthday party this year. Jamie works as the CEO of a bank and lives in a gated community. Since Jamie lives in such a sunny area, a solar company representative has reached out to Jamie about installing solar panels on her roof.
Low Cost	Taylor is 22 years old and loves to eat chocolate ice cream for dessert. Taylor works two jobs and lives in a neighborhood with a high crime rate. Every summer Taylor notices a neighbor's house with the windows open and considers opening his own windows as well, instead of turning on the air conditioning.	Alex is 53 years old and enjoys playing board games with family members. Alex works as the CEO of a bank and lives in a gated community. Alex has seen ads for creative ways to reuse empty jars and containers that used to hold food products.

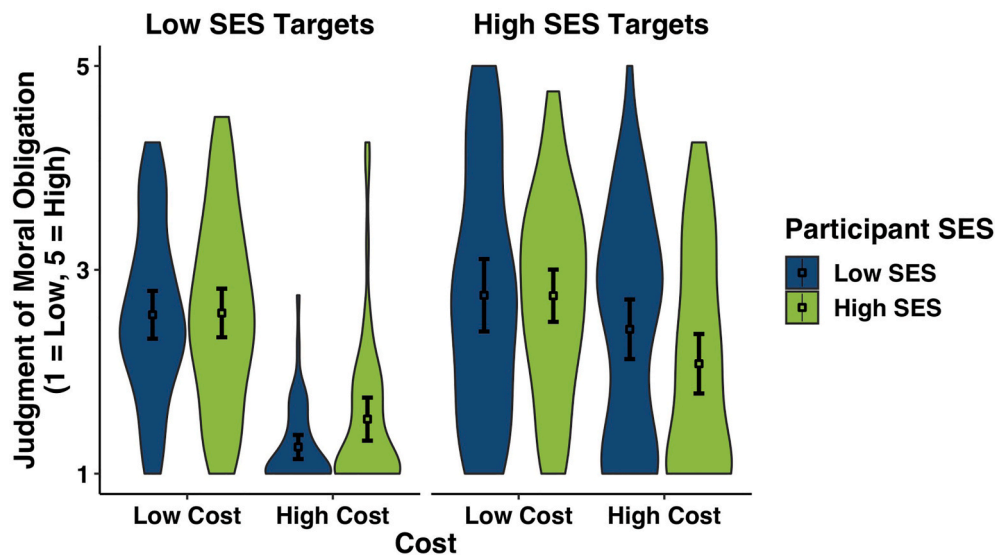


Fig. 3. Violin plots representing probability densities for moral obligation ratings in Study 3. Note. Means are represented by open squares. Error bars indicate 95% confidence intervals.

Air Task Force, an environmental charity.

#### 4.2. Results

Responses were aggregated across each set of four scenarios. A visual inspection of the means (see Fig. 3) indicated that, for the Low Cost vignettes, participants judged people of Low SES ( $M = 2.57$ ,  $SD = 0.87$ ) and High SES ( $M = 2.75$ ,  $SD = 1.07$ ) as having very similar levels of moral obligation to engage in sustainable actions. For the High Cost vignettes, however, participants judged people of Low SES ( $M = 1.41$ ,  $SD = 0.62$ ) as having a substantially reduced moral obligation to act sustainably than people of High SES ( $M = 2.26$ ,  $SD = 1.08$ ).

A three-way ANOVA was conducted to examine the effects of Target SES, Cost, and Participant SES on perceived moral obligation. Results were similar to those of Studies 1 and 2. There was a large and statistically significant main effect of Target SES,  $F(1, 406) = 25.36$ ,  $p < .001$ ,  $\eta_p^2 = 0.07$ , indicating that overall, participants judged others as having reduced moral obligations in Low SES scenarios as compared to High SES scenarios. There was also a large main effect of Cost,  $F(1, 406) = 79.63$ ,  $p < .001$ ,  $\eta_p^2 = 0.17$ , indicating that participants judged people as having considerably lower moral obligations when the actions incurred a cost than when they didn't. Contrary to Study 1 but similarly to Study 2, there was no main effect of Participant SES,  $F(1, 406) = 0.14$ ,  $p = .705$ ,  $\eta_p^2 = 0.00$ , meaning that there was not a difference in the general judgments of High SES participants and Low SES participants.

There was a strong two-way interaction between Target SES and Cost,  $F(1, 406) = 13.22$ ,  $p < .001$ ,  $\eta_p^2 = 0.03$ , suggesting that participants judged targets' moral obligations as significantly lower in Low SES scenarios than in High SES scenarios when there was a cost involved. There was no significant interaction between Participant SES and Cost,  $F(1, 406) = 0.06$ ,  $p = .813$ ,  $\eta_p^2 = 0.00$ , or between Participant SES and Target SES,  $F(1, 406) = 2.88$ ,  $p = .091$ ,  $\eta_p^2 = 0.01$ , meaning that whether or not a participant was of High or Low SES did not reliably affect their judgments across conditions. There was also a small, non-significant three-way interaction between Target SES, Cost, and Participant SES,  $F(1, 406) = 2.56$ ,  $p = .110$ ,  $\eta_p^2 = 0.01$ .

Judgments of moral obligation were strongly correlated with evaluations of the affordability of engaging in sustainable actions,  $r(412) = 0.49$ ,  $p < .001$ , and with evaluations of culpability for contributing to climate change,  $r(412) = 0.54$ ,  $p < .001$ . Furthermore, the perceived affordability of actions was higher for High SES targets ( $M = 4.13$ ,  $SD = 0.68$ ) than for Low SES targets ( $M = 2.98$ ,  $SD = 1.25$ ),  $t(311.7) = 11.49$ ,

$p < .001$ ,  $d = 1.14$ , and evaluations of culpability for contributing to climate change were higher for people of High SES ( $M = 2.66$ ,  $SD = 0.82$ ) than for people of Low SES ( $M = 2.16$ ,  $SD = 0.68$ ),  $t(403.5) = 6.77$ ,  $p < .001$ ,  $d = 0.66$ . To determine whether affordability and culpability each accounted for the effect of Target SES on judgments of moral obligation, we conducted two mediation analyses. First, we found that higher Target SES predicted higher affordability judgments,  $b = 1.14$  ( $SE = 0.10$ ),  $p < .001$ , and the affordability of actions positively predicted moral obligation,  $b = 0.46$  ( $SE = 0.04$ ),  $p < .001$ . This led to a significant indirect effect,  $b = 0.53$  ( $SE = 0.07$ ),  $p < .001$ . There was no significant direct effect of Target SES on moral obligation,  $b = -0.07$  ( $SE = 0.11$ ),  $p = .535$ . Second, we found that higher Target SES predicted higher culpability judgments,  $b = 0.50$  ( $SE = 0.07$ ),  $p < .001$ , and the culpability of actors positively predicted their moral obligation,  $b = 0.70$  ( $SE = 0.06$ ),  $p < .001$ . This led to a significant indirect effect,  $b = 0.35$  ( $SE = 0.06$ ),  $p < .001$ . There was no significant direct effect of Target SES on moral obligation,  $b = 0.11$  ( $SE = 0.09$ ),  $p = .228$ . Thus, affordability and culpability each fully mediated the relationship between targets' socioeconomic status and their perceived moral obligations.

Finally, High SES participants donated more money to the environmental charity ( $M = 4.90$  cents,  $SD = 4.52$  cents) than Low SES participants ( $M = 3.49$  cents,  $SD = 4.26$  cents),  $t(410.8) = 3.26$ ,  $p = .001$ ,  $d = 0.32$ . Across all participants, donation amounts were positively correlated with judgments that others are morally obligated to engage in sustainable actions,  $r(411) = 0.27$ ,  $p < .001$ .

#### 4.3. Discussion

Study 3 replicated and extended the results from Studies 1 and 2, using a fully between-subjects design. Overall, it remained clear that people of High SES were judged to have greater moral obligations to act sustainably, particularly when these sustainable actions required a substantial monetary cost. This study also identified two mechanisms explaining the effect of Target SES on judgments of moral obligation. First, the degree to which the people being evaluated could more easily afford the monetary cost of the action fully mediated this effect. Second, the degree to which the people being evaluated were deemed to be more culpable for contributing to climate change also fully mediated the effect.

Study 3 additionally demonstrated that people of higher SES actually do feel more of an obligation than people of lower SES to offset climate change; High SES participants were more likely to donate a portion of a



small (10-cent) bonus to the Clean Air Task Force than were Low SES participants. These donation amounts were also correlated with third-party judgments of others' obligations to act sustainably. However, future research will be needed to discern whether this applies to larger, more meaningful donations. Future research should also investigate the degree to which this effect is specific to causes related to sustainability or if it is instead more broadly applicable to charitable giving.

## 5. General discussion

The three studies described in this paper sought to illuminate whether socioeconomic standing and the affordability of sustainable actions influence perceived moral obligations to engage in these actions. We specifically sought to answer the following questions: Is there a belief that people with the means to act sustainably have a moral obligation to do so more than those who don't have similar means? How does one's own socioeconomic privilege affect this perceived responsibility? How do moral judgments differ overall and across SES if acting sustainably requires spending money?

Across each of our studies, we found consistent evidence that people judge those of higher SES to have a greater obligation to act sustainably than those of lower SES, primarily in cases when acting sustainably required a clear monetary cost. These two factors—the cost of actions and the socioeconomic status of the individuals being evaluated—each exerted a sizable influence on moral obligations, regardless of whether participants were evaluating strangers (Studies 1 and 3) or imagined versions of themselves at different positions in society (Study 2). Study 3 demonstrated that the effect of Target SES was a function of both perceived financial burdens in Low SES targets and elevated carbon footprints in High SES targets. Overall, these results align with previous research indicating that perceived SES is positively correlated with environmental concern (Sulemana et al., 2016) and that moral judgments of consumers who make ethically relevant purchases depend on their own economic status and the monetary cost of the behavior (Olson et al., 2016). These results also support the findings of previous research showing that wealthier individuals were considered to be more obligated to make charitable donations than less wealthy individuals (Berman et al., 2020). Our results extend these previous findings by showing that these phenomena apply even to actions that have far-reaching consequences involving the global climate.

Even though people of marginalized identities and lower income tend to have a higher risk perception of climate change (Fielding et al., 2020) and often feel the effects more (Intergovernmental Panel on Climate Change, 2007; Semenza et al., 2008), which would suggest a more prominent sense of urgency, there was weak evidence of participants' own SES impacting their judgments of moral obligation, with a main effect of this variable uncovered only in Study 1 and with no two-way interaction effects uncovered in any study. Furthermore, contrary to predictions generated by work on moral hypocrite (e.g., Valdesolo & DeSteno, 2007) and motivated cognition (e.g., Uhlmann et al., 2009), we did not uncover clear indications that High SES participants discounted the obligations of High SES targets, suggesting that participants did not hold people of their own social status to a lower moral standard. Thus, contrary to some previous work (e.g., Berman et al., 2020), only the SES of targets, and not the SES of participants, was predictive of participants' assessments of moral obligation. However, Study 3 indicated that participants of higher SES were more likely to donate money to an environmental charity than participants of lower SES.

While this research gives new insights into perceived obligations for individual actions, successfully mitigating the causes and impacts of climate change requires cooperation from large corporations and government entities. Interpretations of this research should thus consider broader implications of how power structures manifest within sustainability initiatives, as well as how they create systems in which environmental injustices occur. A potential avenue for further research is to

explore the relationship between accessibility to sustainable options and obligations for larger bodies of people—institutions, communities, or nations—to engage in sustainable behaviors. Just as obligations are weighted for individuals depending on their SES, less wealthy countries who contribute more modestly to climate change and experience the effects to a greater extent than wealthier countries may be held to a different standard than high-GDP countries like the USA and China (Field et al., 2014; Miranda et al., 2011; Swim & Bloodheart, 2018). As a previous study identified, there is a lack of regard for equity in international climate policy among higher GDP countries (Lange et al., 2007). Investigating whether or not wealthier nations are considered to be obliged to take on an increased responsibility for slowing climate change, by their own constituents and by others, may inform political discourse surrounding climate change action and the ways in which different nations approach such agreements.

In sum, this research indicates that people of higher SES are considered to have a greater moral obligation to act sustainably. This is encouraging in terms of the potential for moral obligations to translate into relatively large monetary contributions being funneled toward sustainable initiatives. However, given frequent gaps between beliefs and actions (Kollmuss & Agyeman, 2010), it is critical to determine the extent to which the moral convictions uncovered in this research are prone to produce tangible effects. Future research should thus investigate how perceived moral obligations translate into actual sustainable behaviors, particularly given research showing that people more frequently fail to enact their environmental values in high-cost situations (Diekmann & Preisendörfer, 2003; Farjam et al., 2019), as well as research showing that people feel a moral license to abstain from engaging in environmentally friendly actions upon considering their past exhibitions of pro-environmental behaviors (Gholamzadehmira et al., 2019; Tyler et al., 2010).

While for some, climate change is a peripheral, future problem, for others it is an immediate source of distress. Discrepancies exist between who contributes to climate change, who feels the effects of climate change, and even who has the ability to make sustainability-oriented decisions (which come with their own set of social and personal benefits). The present findings offer a hopeful view for a future in which people who are able to help keep the planet habitable recognize their responsibility and lessen the burden for others.

## Declarations of conflicts of interest

None.

## Credit author statement

Mira Lerner: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Funding acquisition. Joshua Rottman: Conceptualization, Methodology, Formal analysis, Writing – review & editing, Supervision, Funding acquisition.

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