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Social class, control, and action: Socioeconomic status differences in antecedents of support for pro-environmental action



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ABSTRACT

Addressing social issues such as climate change requires significant support and engagement of citizens with diverse socioeconomic backgrounds. The present research examines whether individuals who vary in their socioeconomic status significantly differ in their psychological antecedents of support for pro-environmental action. Study 1, using U.S. nationally representative data, showed that personal beliefs about climate change predicted support for pro-environmental policies more strongly among individuals with a higher, relative to lower, SES background. Studies 2 and 3, by employing correlational and experimental approaches respectively, found that general sense of control over life outcomes underlies the extent to which support for pro-environmental action is contingent on personal beliefs about climate change. Study 4 identified perceived social norms about pro-environmental actions as an alternative predictor of support for pro-environmental action among people from lower SES background. Taken together, the present research shows that individuals with distinct socioeconomic backgrounds differ in their key psychological levers of pro-environmental action. To grasp how to solve urgent social issues such as climate change requires greater understanding of the psychology of citizens with diverse backgrounds.

1. Introduction

In 2016, the majority of Americans viewed protecting the environment as one of the top priorities for policy makers, and reported being strongly concerned about the environment. Yet, far fewer Americans reported making an effort to live in ways to actually help protect the environment (Pew Research Center, 2017). This gap between environmental attitudes/beliefs and environmental engagement has been recognized as a major challenge to address environmental problems (Gifford, 2011). This dissociation also suggests that in addition to increasing awareness and concerns about environmental threats, there has to be better understanding of the connection (or lack thereof) between environmental concerns and pro-environmental actions, and ultimately of what drives pro-environmental actions.

The present research seeks to address this question by focusing on psychological diversity. We propose that the overall weak, and perhaps puzzling association between environmental concerns and pro-environmental actions reflects variability in psychological antecedents of pro-environmental action across individuals from different socio-cultural and economic backgrounds. What serves as the primary determinant of action is shaped by sociocultural contexts (Kashima, Siegal, Tanaka, & Kashima, 1992; Markus & Kitayama, 2003; Savani,

Markus, & Conner, 2008). Internal aspects of the self, such as personal attitudes and beliefs, become more important behavioral guidance in contexts with greater resources and autonomy (Riemer, Shavitt, Koo, & Markus, 2014; Snibbe & Markus, 2005).

Building on this idea, we propose that personal beliefs about climate change may be a better predictor of pro-environmental support and engagement among individuals with a higher SES background, which tends to provide greater resources and control over life outcomes, than among individuals with a lower SES background, which tends to limit resources and control over life outcomes. In four studies, we examine the SES difference, as well as investigate a psychological explanation for the SES difference in the link between climate change beliefs and pro-environmental action. We also seek to identify an alternative predictor of pro-environmental engagement among lower SES individuals.

1.1. Psychological antecedents of support for pro-environmental action

A large volume of research has generated theoretical frameworks and empirical findings to better understand the psychology of pro-environmental action (e.g., Carfora, Caso, Sparks, & Conner, 2017; Kashima, Paladino, & Margetts, 2014; Milfont, Richter, Sibley, Wilson, & Fischer, 2013; Stern, 2000; van der Linden, 2018; Whitmarsh &

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O'Neill, 2010; see Gifford, 2014; Pearson, Schuldt, & Romero-Canyas, 2016 for reviews). Of the potential psychological factors driving pro-environmental action, individuals' environmental attitudes, environmental concerns, and climate change beliefs have received great attention in the literature (Milfont & Page, 2013). Although such personal awareness of environmental issues is reliably associated with pro-environmental behavior, there is a considerable discrepancy between environmental awareness and pro-environmental behavior (for reviews, see Fransson & Gärling, 1999; Kollmuss & Agyeman, 2002).

Several recent studies have revealed that the extent to which personal concern about environmental issues predicts pro-environmental engagement varies significantly across societies with distinct socio-cultural orientations (Eom, Kim, Sherman, & Ishii, 2016; Tam & Chan, 2017). For example, personal concern about sustainability predicted support for pro-environmental action more strongly among individuals from individualistic cultures than those from collectivistic cultures (Eom et al., 2016). The stronger association between environmental concern and pro-environmental support was also observed in societies with higher levels of cultural looseness (i.e., the extent to which society affords a tolerance of individuals' discretion; Gelfand, Nishii, & Raver, 2006) (Tam & Chan, 2017).

It is important to note, however, that people reside in distinct life circumstances even within a given nation. For instance, positions of individuals in the social class hierarchy lead to different life situations and psychological characteristics (for a review, see Kraus, Piff, Mendoza-Denton, Rheinschmidt, & Keltner, 2012). Based on this perspective, the present set of studies examines how socioeconomic status (SES) background may shape the extent to which personal awareness of environmental threats predicts pro-environmental engagement.

1.2. SES and climate change beliefs and actions

SES is a multifaceted concept that incorporates economic status (e.g., income), social status (e.g., education), and work status (e.g., occupation) (Dutton & Levine, 1989). There is a considerable amount of research on how SES is related to beliefs about climate change and pro-environmental action. This body of research has generally found a positive but weak association between SES and beliefs and awareness of climate change. People with higher income and education tend to report stronger beliefs that climate change is occurring and humans are responsible for it, in studies conducted both across nations (e.g., Hornsey, Harris, Bain, & Fielding, 2016) and within the United States (e.g., McCright, 2010).

Higher SES individuals, however, do not necessarily show greater support and motivation for pro-environmental actions. Income negatively predicted intentions to perform pro-environmental behaviors such as driving less and using public transportation more (O'Connor, Bord, Yarnal, & Wiefek, 2002). Yet, neither education nor income predicted other pro-environmental behaviors such as recycling, water conservation, and buying environmentally friendly products (Baldassare & Katz, 1992). In short, the existing results about SES effects in the absolute levels of pro-environmental action are mixed and may depend on the type of pro-environmental actions (see Pearson, Ballew, Naiman, & Schuldt, 2017 for a review).

Taken together, to the extent that higher and lower SES people differ in their climate change beliefs and support for pro-environmental actions, the difference is neither strong, nor unidirectional. Beyond these mean differences in pro-environmental tendencies, one way to advance the understanding of how socio-economic factors impact these important outcomes is to investigate SES specific instigators of pro-environmental (and anti-environmental) engagement. The present research investigates SES differences in psychological antecedents of support for pro-environmental action.

1.3. SES, control, and antecedents of action

SES influences important psychological tendencies and life outcomes. There are considerable differences across different SES groups in self-concept (Snibbe & Markus, 2005; Stephens, Markus, & Townsend, 2007), socio-emotional characteristics (Kraus, Côté, & Keltner, 2010), morality (Côté, Piff, & Willer, 2013), academic performance (Croizet & Claire, 1998), health (Adler et al., 1994; Lachman & Weaver, 1998), and subjective well-being (Diener & Suh, 1997; Howell & Howell, 2008).

Central to our present analysis, different levels of accessibility to social and material resources between lower vs. higher SES individuals lead people to hold different assumptions about how and why people act (see Kraus et al., 2012 for a review). Greater social and economic resources in higher SES contexts afford people increased opportunities to bring outcomes according to what they want, believe, and feel. Consequently, higher SES individuals are more likely to develop the beliefs that internal states are supposed to be primary determinants of action. In contrast, resource-insufficient circumstances in lower SES contexts limit the ability of people to behave in ways consistent with internal self. Thus, lower SES individuals tend to develop the view that life outcomes are generally determined by factors beyond their control, rather than by their desires, beliefs, and feelings. Consequently, lower SES individuals may consider acting on their internal states to be relatively futile compared to higher SES individuals (see Kraus et al., 2012 for a relevant theoretical discussion).

Empirical evidence has supported this theoretical framework. For example, higher, relative to lower, SES individuals tend to feel more uncomfortable (i.e., cognitive dissonance) when their behavior does not match attitudes. Consequently, higher SES individuals are more likely to change their attitudes to bring them in line with their behavior (Snibbe & Markus, 2005). Higher SES individuals are also more likely to attribute life outcomes (e.g., getting into medical school) to their own internal factors, whereas lower SES individuals are more likely to endorse contextual factors as responsible for the same life outcomes (Kraus, Piff, & Keltner, 2009). Although these findings support the notion that higher SES individuals have a stronger assumption that internal aspects of the self are the primary basis of behavior than lower SES individuals do, little work has directly examined SES differences in the extent to which internal factors are predictive of action and behavior. The present research examines this question and uncovers a psychological underpinning of the SES difference in the domain of a timely social issue—climate change.

We hypothesize that sense of control—the perception of having significant influence on life outcomes (Lachman & Weaver, 1998; Rotter, 1966; Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993)—is a compelling candidate that may underlie SES differences in the extent to which actions are contingent on internal factors. Sense of control is stronger among those with greater resources, and it has been identified as a key factor responsible for psychological differences between individuals with distinct SES backgrounds (Lachman & Weaver, 1998). Furthermore, perceived control for outcomes has been recognized as a prerequisite for attitudes to be translated into relevant actions (Kruglanski et al., 2015). We reason that the lower sense of control among lower SES individuals, fostered by their experience of recurring barriers to achieve what they want, may be a psychological factor that explains why they are less likely than higher SES individuals to act according to what they think and feel.

Finally, if personal attitudes and beliefs are not strong instigators of action among lower SES individuals, there must be other factors that propel them to act. That is, their action may reflect particular perspectives fostered by their life circumstances that are different from the life circumstances of higher SES individuals. The nature of low SES contexts with greater threats (Evans, 2004; Miller, Chen, & Parker,

2011) and reduced control (Lachman & Weaver, 1998) increases the importance of affiliation and interdependence with others. Consequently, lower SES individuals tend to prioritize choices that reflect social norms (Stephens et al., 2007; Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012). Based on this research, we propose perceived social norms as a potential alternative predictor of support for social action among lower SES individuals.

2. The present research

We report four studies examining SES differences in psychological antecedents of support for pro-environmental action. *Support for pro-environmental action* is an inclusive term that refers to various forms of individuals' support and engagement to address environmental issues. It includes political and financial support as well as daily pro-environmental behaviors such as recycling, consumer choice, and energy conservation. We assess these different outcomes across the four studies in the present paper.

Using a U.S. nationally representative sample, Study 1 examines SES differences in the extent to which personal beliefs about climate change predict pro-environmental policy support. Utilizing a correlational and experimental design, respectively, Studies 2 and 3 examine sense of control as a psychological factor behind the observed SES differences. Lastly, in Study 4, we conducted a field study to examine the role of perceived social norms about environmental behavior as an alternative psychological antecedent of support for pro-environmental action among lower SES individuals.

We tested three hypotheses: (1) personal beliefs about climate change would predict support for pro-environmental action more strongly among higher SES than lower SES individuals (Studies 1, 2, 3, 4); (2) sense of control would explain the SES difference in how much support for pro-environmental action is predicted by beliefs about climate change (Studies 2, 3); (3) perceived social norms about pro-environmental behavior would predict support for pro-environmental action more importantly among lower SES individuals (Study 4).

Sample size was determined prior to data collection. For the ANES study (Study 1), we used all eligible participants. For the remaining studies, we sought to have a minimum of 50 participants per "group" (e.g., low/high climate change beliefs \times low/high SES would be 4 groups). This would enable us to be powered at 0.80, assuming a small to medium effect size of the interaction between key continuous predictors ($f^2 = 0.04$, $\alpha = 0.05$) (Cohen, 1988). In the studies in the present paper, we report all measures, manipulations, and exclusions.¹

3. Study 1

Study 1 used the 2016 American National Election Studies (ANES), a national representative sample in the U.S., to provide an initial test of SES differences in the extent to which climate change beliefs predict support for pro-environmental action. We examined respondents' support for environmentally-friendly policies as an outcome. It was hypothesized that climate change beliefs predict support for pro-environmental policies to a greater extent among higher, relative to lower, SES individuals.

3.1. Method

3.1.1. Participants

The American National Election Studies (ANES) 2016 data set was used.² This data includes answers of 4271 U.S. citizens whose ages were

18 or older (52.3% females; 3038 European Americans, 398 African Americans, 450 Latino Americans, 148 Asian/native Hawaiian, 177 Other, 27 Native American/Alaska Native, and 33 not reported). Respondents reported their age by choosing one out of thirteen age categories. The median age group was between 45 and 49.

3.1.2. Materials and measures

3.1.2.1. Climate change beliefs. Beliefs about climate change were assessed by two items that measure the extent to which people believe in the actuality and human responsibility of climate change: (a) "...world's temperature may have been going up...do you think this has probably been happening, or do you think it probably hasn't been happening?" (1 = *has probably been happening*, 2 = *probably hasn't been happening*) and (b) "do you think a rise in the world's temperatures would be caused mostly by human activity, mostly by natural causes, or about equally by human activity and by natural causes?" (1 = *mostly by human action*, 2 = *mostly by natural causes*, 3 = *about equally by human action and natural causes*). We re-coded the scores of these items to make higher scores indicate stronger belief in climate change (is occurring and is caused by human activity) ($M = 1.82$, $SD = 0.38$ for actuality of climate change; $M = 2.22$, $SD = 0.72$ for human-causing climate change). We standardized and combined the two items to generate a composite of climate change beliefs, $r(4204) = 0.35$, $p < .001$.

3.1.2.2. Socioeconomic status. As SES is defined as a multi-faceted factor (Dutton & Levine, 1989), studies on SES and psychology have assessed SES using a combination of education and income (e.g., Kraus et al., 2009; Piff, Kraus, Côté, Cheng, & Keltner, 2010). In the studies reported in the present paper, socioeconomic status was also assessed using both income (as economic status) and education (as social status).³

In Study 1, education level was measured with five categories: (a) less than high school ($n = 282$, 6.6%), (b) high school credential ($n = 810$, 19.0%), (c) some post high school, no bachelor's degree ($n = 1500$, 35.1%), (d) bachelor's degree ($n = 955$, 22.4%), and (e) graduate degree ($n = 680$, 15.9%). The median education was some post high school without bachelor's degree. As for family income, respondents chose one of twenty-eight categories (from under \$5000 to \$250,000 or more). The median income was between \$50,000 and \$54,999. Education attainment and family income were standardized and averaged as an index of SES, $r(4037) = 0.41$, $p < .001$, with higher scores indicating higher SES.

3.1.2.3. Pro-environmental policy support. Pro-environmental policy support was measured by the following three items available in ANES 2016: (a) "Do you think the federal government should be doing more about rising temperatures, should be doing less, or is it currently doing the right amount?" (1 = *should be doing a great deal more* to 7 = *should be doing a great deal less*), (b) "Where would you place yourself on this scale?" (1 = *regulate business to protect the environment and create jobs* to 7 = *no regulation because it will not work and will cost jobs*), and (c) "Do you favor, oppose, or neither favor nor oppose fracking in the U.S.?" (1 = *favor*, 2 = *oppose*, 3 = *neither favor nor oppose*). The scores were re-coded so that higher scores indicated stronger support for pro-environmental policies ($M = 4.85$, $SD = 1.89$, for support for stronger government action about rising temperatures; $M = 4.85$, $SD = 1.81$ for regulating business for the environment; $M = 2.19$, $SD = 0.73$ for opposing fracking). These three items were standardized and averaged to form a composite measure of pro-environmental policy support; higher scores indicated stronger support ($\alpha = 0.68$).

¹ The numbers of degrees of freedom in statistical analyses change when there were missing data points of the variables in studies.

² We used unweighted data. Neither the significance nor direction of the results differed as a function of using weighted or unweighted data.

³ We also analyzed all our data with income and education separately. The key interaction patterns between climate change beliefs and SES remain significant although some of the effects became weaker to the marginal significance level. The composite measure of SES that incorporates both income and education showed the most consistent and reliable effects across studies.

Table 1
Correlations between key measures in Studies 1, 2, and 4.

Variable	Study 1			Study 2				Study 4			
	1	2	3	1	2	3	4	1	2	3	5
1. Climate change beliefs	–	0.12***	0.58***	–	–0.10	0.31***	–0.02	–	–0.01	0.16** ^a	0.05
2. SES	0.12***	–	0.03 [†]	–0.10	–	–0.00	0.14*	–0.01	–	0.06 ^a	0.17*
3. Support for pro-environmental action	0.58***	0.03 [†]	–	0.31***	–0.00	–	–0.09	0.16** ^a	0.06 ^a	–	0.16** ^a
4. Sense of control				–0.02	0.14*	–0.09	–				
5. Perceived descriptive norms								0.05	0.17*	0.16** ^a	–

^a The correlation coefficients related to pro-environmental action in Study 4 were estimated by the point biserial correlation because the measure was dichotomous.

*** $p < .001$.

* $p < .05$.

[†] $p < .10$.

3.1.2.4. Demographic covariates. The following variables were used as potential covariates: gender, age, ethnicity, and political orientation. Respondents reported their age group by selecting a group from thirteen categories (from age group 17 to 20 to age group 75 or older) and their ethnic group by choosing one of four possible groups (White, Black, Hispanic, and Other). We dummy-coded the ethnicity into White (coded as zero; $n = 3038$) vs. non-White (coded as one; $n = 1200$). Political orientation was measured by a 7-point item (1 = *extremely liberal* to 7 = *extremely conservative*; $M = 4.18$, $SD = 1.60$).

3.2. Results

We first examined the bivariate correlations between the key variables. There was a strong positive correlation between climate change beliefs and support for pro-environmental policies, $r(4237) = 0.58$, $p < .001$. There was also a weak positive correlation between SES and climate change beliefs, $r(4235) = 0.12$, $p < .001$. SES was not correlated with support for pro-environmental policies, $r(4242) = 0.03$, $p = .07$. The bivariate correlations between key variables across the four studies are shown in Table 1. Table 2 also presents descriptive

statistics of the key variables as a function of SES levels (broken down by quartiles) across the four studies.

To examine whether SES moderates the relationship between climate change beliefs and support for pro-environmental policies, we conducted a hierarchical linear regression. At Step 1, we entered SES and climate change beliefs (centered) as predictors. At Step 2, their interaction term was entered as an additional predictor. Pro-environmental policy support was the outcome variable. At Step 1, there were significant main effects of SES, $\beta = -0.04$, $b = -0.04$, $SE = 0.01$, $t(4228) = -3.45$, $p = .001$, 95% CI for $b = [-0.06, -0.02]$, as well as of climate change beliefs, $\beta = 0.58$, $b = 0.56$, $SE = 0.01$, $t(4228) = 46.14$, $p < .001$, 95% CI for $b = [0.53, 0.58]$. Higher SES individuals were less likely to support pro-environmental policies, and those with stronger belief in climate change reported stronger support for pro-environmental policies.

At Step 2, these main effects were qualified by the significant interaction between belief in climate change and SES, $\beta = 0.12$, $b = 0.13$, $SE = 0.01$, $t(4227) = 9.25$, $p < .001$, 95% CI for $b = [0.10, 0.16]$ (see Fig. 1). Belief in climate change predicted support for pro-environmental policies to a greater extent among higher SES individuals (1 SD above the mean), $\beta = 0.70$, $b = 0.68$, $SE = 0.02$, $t(4227) = 38.78$,

Table 2
Descriptive statistics of key measures across SES groups in Studies 1 to 4.

Variable	SES level	Study 1			Study 2			Study 3			Study 4		
		n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD
Climate change beliefs	Top 25%	1068	0.13 ^a	0.78	55	3.57	1.01	103	3.84	0.99	51	4.18	0.60
	2nd 25%	1076	0.01 ^a	0.80	52	3.78	0.95	80	3.81	0.86	49	4.10	0.57
	3rd 25%	1055	–0.05 ^a	0.86	51	3.65	1.01	89	4.09	0.77	51	4.21	0.64
	Bottom 25%	1032	–0.10 ^a	0.84	54	3.82	0.79	99	3.83	0.86	49	4.13	0.68
Support for pro-environmental action	Top 25%	1068	0.04 ^a	0.83	55	2.88 ^b	0.73	103	2.96 ^c	0.91	51	56.9% ^d	
	2nd 25%	1076	–0.05 ^a	0.84	52	2.96 ^b	0.73	80	2.70 ^c	0.89	49	46.9% ^d	
	3rd 25%	1055	–0.00 ^a	0.76	51	2.86 ^b	0.65	89	2.82 ^c	0.91	51	39.2% ^d	
	Bottom 25%	1032	–0.01 ^a	0.71	54	2.87 ^b	0.71	99	2.97 ^c	1.02	49	46.9% ^d	
Sense of control	Top 25%				55	5.31 ^e	0.93						
	2nd 25%				52	5.29 ^e	1.07						
	3rd 25%				51	4.96 ^e	1.18						
	Bottom 25%				54	5.01 ^e	1.11						
Perceived norms about environmental action	Top 25%										51	3.58 ^f	0.50
	2nd 25%										49	3.58 ^f	0.59
	3rd 25%										51	3.48 ^f	0.50
	Bottom 25%										49	3.32 ^f	0.66

Note. Climate change beliefs were measured by 1- to 5-point scales except in Study 1.

^a The composites of climate change beliefs and pro-environmental action in Study 1 were calculated based on standardized scores of items due to the different scale points between the items.

^b Pro-environmental action was measured by 1- to 5-point items in Study 2.

^c Intentions to perform pro-environmental actions were measured by a 1- to 6-point scale in Study 3.

^d The percentage of participants who pledged for the environmental campaign within each SES quartile.

^e Sense of control was measured by a 1- to 7-point scale in Study 2.

^f Perceived descriptive norms about environmental behavior were measured by 1- to 5-point items in Study 4.

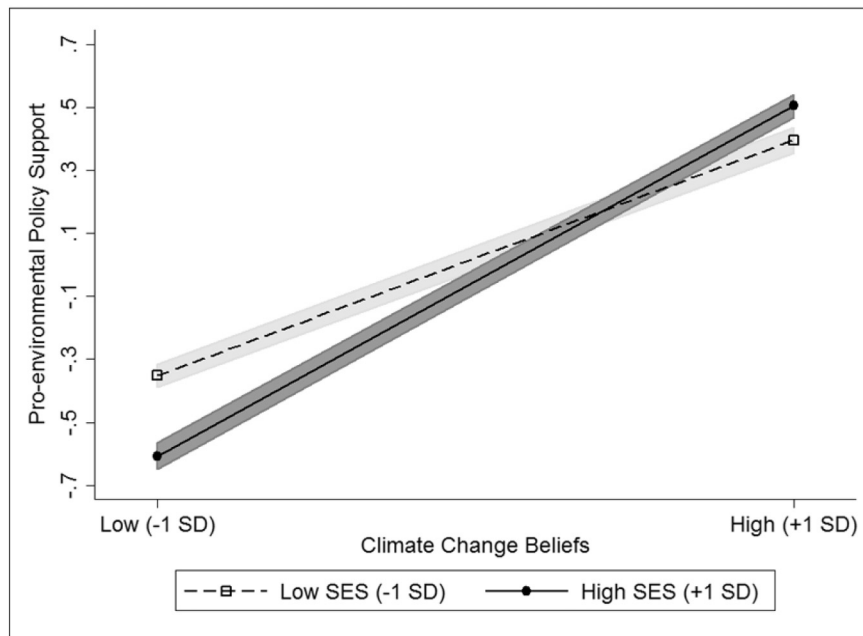


Fig. 1. Pro-environmental policy support as a function of belief in climate change and SES in Study 1. Shaded areas indicate continuous 95% confidence intervals.

$p < .001$, 95% CI for $b = [0.64, 0.71]$, than among lower SES individuals (1 SD below the mean), $\beta = 0.47$, $b = 0.45$, $SE = 0.02$, $t(4227) = 27.49$, $p < .001$, 95% CI for $b = [0.42, 0.48]$. Viewed differently, when people held stronger belief in climate change (1 SD above the mean), higher SES individuals reported significantly stronger support for pro-environmental policies than lower SES individuals, $\beta = 0.09$, $b = 0.07$, $SE = 0.02$, $t(4227) = 4.14$, $p < .001$, 95% CI for $b = [0.04, 0.10]$. However, when people held weaker belief in climate change (1 SD below the mean), higher SES individuals reported significantly weaker support for pro-environmental policies than lower SES individuals, $\beta = -0.19$, $b = -0.15$, $SE = 0.02$, $t(4227) = -9.00$, $p < .001$, 95% CI for $b = [-0.18, -0.11]$. The key interaction between climate change beliefs and SES remained consistent controlling for the demographic variables: gender, age, ethnicity, and political orientation, $\beta = 0.05$, $b = 0.06$, $SE = 0.02$, $t(3156) = 3.78$, $p < .001$, 95% CI for $b = [0.03, 0.09]$.⁴

3.3. Discussion

Using a nationally representative sample in the U.S., Study 1 provided initial evidence for SES differences in the association between climate change beliefs and support for pro-environmental action. Belief in climate change more strongly predicted support for pro-environmental public policies among higher than lower SES individuals. Lower SES individuals generally supported pro-environmental policies more strongly than higher SES individuals, and their policy support was not as strongly linked to their beliefs about the corresponding issue as higher SES individuals' policy support.

4. Study 2

The main purpose of Study 2 was to directly investigate a

⁴ Analyses in which we treated two items about climate change beliefs separately showed consistent patterns. The moderation of SES was significant with beliefs about human responsibility of climate change with or without the covariates. The moderation of SES was significant with belief in actuality of climate change without the covariates, but it became non-significant with the covariates ($b = 0.07$, $SE = 0.04$, $p = .104$). Thus, it seems that the reported moderation effect of SES in Study 1 is more strongly driven by belief in human responsibility.

psychological factor underlying the observed SES difference. We focused on sense of control—people's perception that they have significant influence on their life outcomes (Lachman & Weaver, 1998; Rotter, 1966; Thompson et al., 1993). Specifically, we examined whether different levels of sense of control between lower vs. higher SES individuals would explain the SES difference in the relationship between climate change beliefs and pro-environmental action. We reasoned that for those living in an environment that provides a lower sense of control (i.e., lower SES individuals), personal attitudes and beliefs would be less likely to be driving factors of action than for those living in an environment that offers a greater sense of control (i.e., higher SES individuals). In Study 2, we focused on daily pro-environmental behaviors as an outcome to investigate the generalizability of the pattern in domains other than policy support. We also used valid and reliable scales to measure our key constructs to remedy one shortcoming of Study 1 that relied on the limited number of items available in the public data set.

To test the hypothesis that sense of control underlies the predicted SES difference, we adopted the mediated cultural moderation approach (e.g., Kim & Sherman, 2007; Uskul, Sherman, & Fitzgibbon, 2009). This approach is a specific form of mediated moderation analysis (Muller, Judd, & Yzerbyt, 2005) to unpack psychological processes behind moderation effects of group/culture variables. It examines whether certain group/culture-related moderation effects are driven by hypothesized psychological factor(s) that vary between groups/cultures. Using this approach, we tested whether the moderation effect of SES on the relationship between climate change beliefs and support for pro-environmental action was explained by the SES difference in sense of control. In Study 2, we also tested two other key predictions in the current research model: (1) whether higher, compared to lower, SES individuals indeed report greater sense of control and (2) whether sense of control moderates the link between climate change beliefs and support for pro-environmental action in the same way that SES does.

4.1. Method

4.1.1. Participants

Two-hundred twelve adults (42.0% females) were recruited via Amazon's Mechanical Turk. The mean age was 34.25 years ($SD = 10.62$). The largest ethnic group was European Americans

($n = 168$, 79.2%) followed by Asian Americans ($n = 17$), African Americans ($n = 13$), Latino Americans ($n = 10$), Native Americans ($n = 2$), Native Pacific Islander ($n = 1$), and Other ($n = 1$). Eighteen additional participants who started but did not complete the study were excluded from our analyses.

4.1.2. Materials and measures

4.1.2.1. Climate change beliefs. We used a 12-item subset of the Beliefs about Global Climate Change scale (Heath & Gifford, 2006).⁵ This scale consists of items regarding beliefs about actuality (e.g., “It seems to me that weather patterns have changed compared to when I was a child”), negative consequences (e.g., “Global warming will bring about some serious negative consequences”), and human responsibility of climate change (e.g., “Global warming is mainly due to natural causes, not human activity”; reverse). Participants reported their agreement/disagreement with the statements on 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). The scores of 12 items were averaged to form a composite measure of climate change beliefs ($M = 3.71$, $SD = 0.94$, $\alpha = 0.94$). Higher scores indicated stronger belief in climate change (i.e., that it existed, would bring negative consequences, and was caused by humans).

4.1.2.2. Socioeconomic status. Again, participants' SES was assessed by using education attainment and yearly family income. Education level was measured with six categories: (a) less than high school ($n = 0$, 0.0%), (b) high school graduate ($n = 31$, 14.6%), (c) some college ($n = 62$, 29.2%), (d) associate's degree ($n = 27$, 12.7%), (e) bachelor's degree ($n = 72$, 34.0%), and (f) master's degree or higher ($n = 20$, 9.4%). The median education was associate's degree. Family income was measured with the following seven categories: (a) under \$15,000 ($n = 18$, 8.5%), (b) \$15,001 to \$25,000 ($n = 21$, 9.9%), (c) \$25,001 to \$35,000 ($n = 37$, 17.5%), (d) \$35,001 to \$50,000 ($n = 43$, 20.3%), (e) \$50,001 to \$75,000 ($n = 50$, 23.6%), (f) \$75,001 to \$100,000 ($n = 22$, 10.4%), and (g) over \$100,000 ($n = 21$, 9.9%). The median income was between \$35,001 and \$50,000. The education level and family income were standardized and averaged as an index of SES, $r(210) = 0.33$, $p < .001$.

4.1.2.3. Sense of control. Sense of control was assessed by Lachman and Weaver's (1998) 12-item scale. Example items include “I can do just about anything that I really set my mind to” and “What happens in my life is often beyond my control (reverse).” Participants rated their agreement/disagreement with each item on 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*). The scores of 12 items were averaged to create a composite measure ($M = 5.14$, $SD = 1.08$, $\alpha = 0.91$). Higher scores indicated higher sense of control.

4.1.2.4. Pro-environmental action. We selected 16 items from existing ecological behavior scales to assess self-reports of pro-environmental action (Brick & Lewis, 2014; Brick, Sherman, & Kim, 2017; Kaiser, 1998). We used this subset of items to have a reasonable length of the study for online survey. Items less clear in terms of their link to the environment were excluded (e.g., “I wait until I have a full load before doing my laundry”). The final-set items included a comprehensive range of pro-environmental engagement such as recycling, water and energy conservation, green consumption, donation, and volunteering. Participants indicated their extent of pro-environmental engagement by rating either their agreement/disagreement with the statements (e.g., “I sometimes contribute financially to environmental organizations.”; 1 = *strongly disagree*, 5 = *strongly agree*) or their frequency of

⁵ The original scale included 6 items for belief in actuality of climate change and 4 items each for the other components (negative consequences and human responsibility); 14 items in total. When designing the survey, we only included 4 items from the actuality component for comparability of item number across all three components.

respective behaviors (e.g., “How often do you act to conserve water, when showering, cleaning clothes, dishes, watering plants, or other uses?”; 1 = *never*, 5 = *always*). The items were averaged as a composite of pro-environmental action ($M = 2.89$, $SD = 0.70$, $\alpha = 0.80$). Higher scores indicated stronger pro-environmental action.

4.1.2.5. Demographic covariates. Gender, age, and ethnicity were treated as potential covariates.⁶ Participants reported their own age in an open-ended question and reported their ethnic group by selecting one of eight groups (Asian/Asian American, Black, Hispanic, Native American, Native Pacific Islander, White, Indian, and Other). We dummy-coded the ethnicity into White (coded as zero; $n = 168$) vs. non-White (coded as one; $n = 44$).

4.2. Results

4.2.1. SES moderates the link between climate change beliefs and pro-environmental action

We first ran a hierarchical linear regression to examine whether SES moderated the association between climate change beliefs and self-reports of pro-environmental action. We entered SES and mean-centered climate change beliefs as predictors at Step 1 and their interaction as an additional predictor at Step 2. Pro-environmental action was entered as the outcome variable. There was a significant main effect of climate change beliefs, $\beta = 0.31$, $b = 0.23$, $SE = 0.05$, $t(209) = 4.72$, $p < .001$, 95% CI for $b = [0.14, 0.33]$. Participants with stronger climate change beliefs were more likely to engage in pro-environmental action. The main effect of SES was not significant, $\beta = 0.03$, $b = 0.03$, $SE = 0.06$, $t(209) = 0.45$, $p = .654$, 95% CI for $b = [-0.09, 0.14]$.

The main effect of climate change beliefs was qualified by the significant interaction between climate change beliefs and SES, $\beta = 0.15$, $b = 0.15$, $SE = 0.06$, $t(208) = 2.32$, $p = .021$, 95% CI for $b = [0.02, 0.27]$. Belief in climate change significantly predicted pro-environmental action only among individuals with a higher SES background (1 SD above the mean), $\beta = 0.45$, $b = 0.34$, $SE = 0.07$, $t(208) = 5.10$, $p < .001$, 95% CI for $b = [0.21, 0.47]$, but not among those with a lower SES background (1 SD below the mean), $\beta = 0.13$, $b = 0.10$, $SE = 0.08$, $t(208) = 1.25$, $p = .212$, 95% CI for $b = [-0.06, 0.25]$ (Fig. 2). Viewed differently, when people held stronger belief in climate change (1 SD above the mean), higher SES individuals showed higher levels of pro-environmental action than lower SES individuals, $\beta = 0.15$, $b = 0.15$, $SE = 0.08$, $t(208) = 1.95$, $p = .053$, 95% CI for $b = [-0.002, 0.31]$. In contrast, when people held weaker belief in climate change (1 SD below the mean), higher SES individuals tended to show lower levels of pro-environmental action than lower SES individuals, $\beta = -0.12$, $b = -0.12$, $SE = 0.09$, $t(208) = -1.44$, $p = .152$, 95% CI for $b = [-0.29, -0.05]$. Treating ethnicity, age, and gender as covariates did not change the key interaction effect, $\beta = 0.15$, $b = 0.14$, $SE = 0.06$, $t(205) = 2.21$, $p = .029$, 95% CI for $b = [0.02, 0.27]$.

4.2.2. SES and sense of control

The linear regression analysis with SES as a predictor and sense of control as an outcome variable indicated that SES significantly predicted sense of control, $\beta = 0.14$, $b = 0.18$, $SE = 0.09$, $t(210) = 2.03$, $p = .044$, 95% CI for $b = [0.01, 0.36]$. Higher SES individuals reported greater sense of control than lower SES individuals. This significant positive association between SES and sense of control remained constant controlling for sex, age, and ethnicity, $\beta = 0.14$, $b = 0.19$, $SE = 0.09$, $t(207) = 2.07$, $p = .039$, 95% CI for $b = [0.01, 0.37]$.

⁶ Due to an error, the study did not include a measure of political orientation. Subsequent studies included political orientation, and the results showed that the key findings were consistent controlling for it.

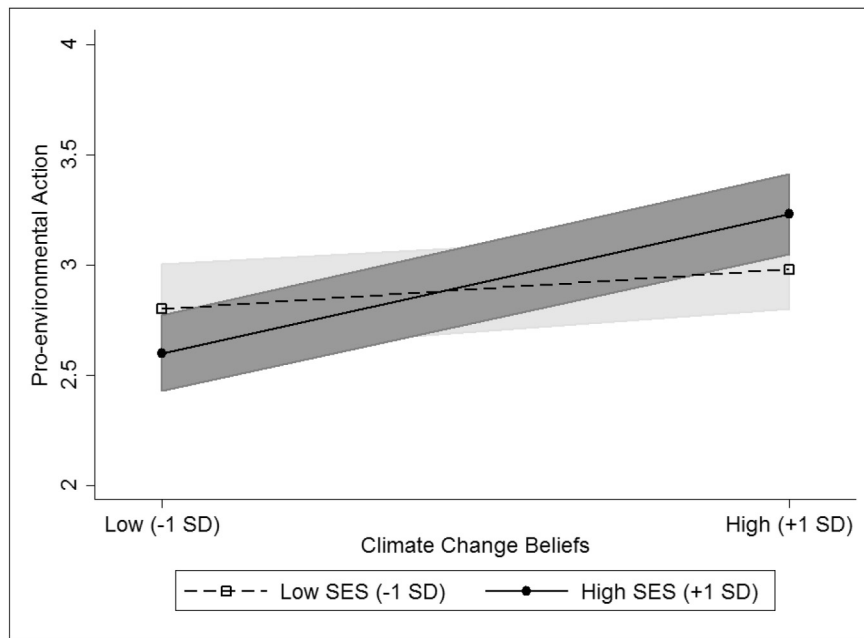


Fig. 2. Pro-environmental action as a function of belief in climate change and SES in Study 2. Shaded areas indicate continuous 95% confidence intervals.

Table 3
Multiple regression results for mediated moderation (Study 2).

Predictor	Regression 1 criterion: pro-environmental action		Regression 2 criterion: sense of control		Regression 3 criterion: pro-environmental action	
	<i>b</i> (β)	<i>t</i>	<i>b</i> (β)	<i>t</i>	<i>b</i> (β)	<i>t</i>
Climate change beliefs	0.22 (0.29)	4.37***	0.03 (0.02)	0.34	0.20 (0.27)	4.08***
SES	0.02 (0.02)	0.28	0.20 (0.15)	2.20*	0.04 (0.05)	0.75
Climate change beliefs \times SES	0.15 (0.15)	2.32*	-0.23 (-0.16)	-2.32*	0.12 (0.12)	1.81 [†]
Sense of control					-0.06 (-0.08)	-1.26
Climate change beliefs \times sense of control					0.10 (0.15)	2.31*

*** $p < .001$.

* $p < .05$.

[†] $p < .10$.

4.2.3. Moderating role of sense of control

We next examined whether individuals with a greater sense of control would have stronger relationships between belief in climate change and pro-environmental action than those with a lower sense of control. In a hierarchical linear regression, climate change beliefs and sense of control (both mean-centered) were entered as Step 1 predictors, and their interaction was additionally entered at Step 2. The outcome variable was self-reported pro-environmental action. The analysis at Step 1 yielded a significant main effect of climate change beliefs, $\beta = 0.31$, $b = 0.23$, $SE = 0.05$, $t(209) = 4.70$, $p < .001$, 95% CI for $b = [0.13, 0.33]$. There was no main effect of sense of control, $\beta = -0.08$, $b = -0.05$, $SE = 0.04$, $t(209) = -1.26$, $p = .210$, 95% CI for $b = [-0.14, 0.03]$.

At Step 2, the main effect of belief in climate change was qualified by the significant interaction between climate change beliefs and sense of control on pro-environmental action, $\beta = 0.16$, $b = 0.10$, $SE = 0.04$, $t(208) = 2.48$, $p = .014$, 95% CI for $b = [0.02, 0.18]$. Climate change beliefs significantly predicted pro-environmental action only among participants with higher sense of control (1 SD above the mean), $\beta = 0.43$, $b = 0.32$, $SE = 0.06$, $t(208) = 5.29$, $p < .001$, 95% CI for $b = [0.20, 0.44]$, but not among those with lower sense of control (1 SD below the mean), $\beta = 0.13$, $b = 0.10$, $SE = 0.07$, $t(208) = 1.38$, $p = .169$, 95% CI for $b = [-0.04, 0.24]$. This interaction was still significant controlling for ethnicity, sex, and age, $\beta = 0.19$, $b = 0.12$,

$SE = 0.04$, $t(205) = 2.79$, $p = .006$, 95% CI for $b = [0.03, 0.20]$. Thus, sense of control moderated the relationship between climate change beliefs and pro-environmental action in a way consistent with how SES moderates the relationship between climate change beliefs and pro-environmental action. Personal belief in climate change predicted pro-environmental action to a greater extent among individuals with higher, than lower, sense of control/SES.

4.2.4. Mediating role of sense of control

Lastly, we examined the role of sense of control in mediating the interaction between climate change beliefs and SES by conducting a mediated moderation analysis (following the procedure outlined in Muller et al., 2005). The results of a series of regression analyses are presented in Table 3.

We first regressed pro-environmental action on climate change beliefs (mean-centered), SES, and their interaction. This regression equation is equivalent to the analysis reported above; there was a significant climate change beliefs \times SES interaction on pro-environmental action, $\beta = 0.15$, $b = 0.15$, $SE = 0.06$, $t(208) = 2.32$, $p = .021$, 95% CI for $b = [0.02, 0.27]$. In the second regression equation, sense of control was regressed onto climate change beliefs (mean-centered), SES, and their interaction. There was a significant main effect of SES, $\beta = 0.15$, $b = 0.20$, $SE = 0.09$, $t(208) = 2.20$, $p = .029$, 95% CI for $b = [0.02, 0.38]$, indicating that higher SES individuals scored higher on sense of

control than lower SES individuals did. There was also a significant interactive effect of climate change beliefs and SES on sense of control, $\beta = -0.16$, $b = -0.23$, $SE = 0.10$, $t(208) = -2.32$, $p = .021$, 95% CI for $b = [-0.43, -0.04]$. Finally, in the third regression equation, pro-environmental action was regressed onto climate change beliefs (mean-centered), SES, climate change beliefs \times SES interaction, sense of control (mean-centered), and climate change beliefs \times sense of control interaction. The interaction between climate change beliefs and sense of control was still a significant predictor of pro-environmental action, $\beta = 0.15$, $b = 0.10$, $SE = 0.04$, $t(206) = 2.31$, $p = .022$, 95% CI for $b = [0.01, 0.18]$, while the coefficient of the interaction between climate change beliefs and SES became marginally significant, $\beta = 0.12$, $b = 0.12$, $SE = 0.06$, $t(206) = 1.81$, $p = .072$, 95% CI for $b = [-0.01, 0.24]$. The interaction between climate change beliefs and sense of control partially mediated the climate change beliefs \times SES interaction on pro-environmental action. The key results did not change when controlling for ethnicity, sex, and age.

We also ran a path analysis to test our mediation model in which sense of control explains the moderation effect of SES. The results provided a generally acceptable fit, comparative fit index = 0.85, root-mean-square error of approximation (RMSEA) = 0.09, $\chi^2(3) = 8.42$, standardized root-mean-square-residual (SRMR) = 0.04. Consistent with the results above, SES positively predicted sense of control, $\beta = 0.14$, $b = 0.18$, $S.E. = 0.09$, $z = 2.04$, $p = .042$, 95% CI for $b = [0.01, 0.36]$. And sense of control significantly moderated the relationship between climate change beliefs and pro-environmental action, $\beta = 0.15$, $b = 0.10$, $S.E. = 0.04$, $z = 2.34$, $p = .019$, 95% CI for $b = [0.02, 0.18]$. Participants with greater sense of control had stronger relationships between climate change beliefs and pro-environmental action. The interaction between climate change beliefs and SES was not significant (see Fig. 3). The patterns and significance of results remained consistent controlling for ethnicity, sex, and age.

4.3. Discussion

Study 2 sheds light on a psychological factor behind the SES effect on the extent to which support for pro-environmental action is

instigated by personal beliefs about climate change. Our results suggest that different levels of sense of control between lower vs. higher SES individuals explain, at least in part, the SES difference in the association between belief in climate change and support for pro-environmental action. Compared to lower SES individuals who feel lower sense of control, higher SES individuals engage in pro-environmental behaviors more consistent with their beliefs about environmental issues due to their greater sense of control over life outcomes. The lower SES individuals' experience of lower control over life outcomes may decrease their motivation to act on personal beliefs about climate change.

We, however, note an alternative explanation for the findings. It may be that the pro-environmental activities are not as available for lower SES people because of their limited time and resources. This explanation is particularly relevant to costly behaviors such as environmentally-friendly consumption, donation, and political participation. To address this issue, using the data in Study 2, we examined the climate change beliefs \times SES interaction on a composite of conservation-only behaviors: 4 items consisting of recycling and energy/water conservation. These behaviors do not require additional resources and in fact, they save resources. There was still a significant moderation of SES on the relationship between climate change beliefs and self-reported pro-environmental action, $\beta = 0.14$, $b = 0.19$, $SE = 0.09$, $t(208) = 2.09$, $p = .037$, 95% CI for $b = [0.01, 0.38]$, such that beliefs about climate change positively predicted those conservation behaviors only among higher SES individuals, $\beta = 0.41$, $b = 0.44$, $SE = 0.10$, $t(208) = 4.56$, $p < .001$, 95% CI for $b = [0.25, 0.63]$, but not among lower SES individuals, $\beta = 0.11$, $b = 0.12$, $SE = 0.11$, $t(208) = 1.10$, $p = .273$, 95% CI for $b = [-0.10, 0.35]$. This suggests that the observed SES differences in predictors of pro-environmental action did not merely reflect different accessibility to pro-environmental activities between SES groups.

5. Study 3

Study 3 further examined the role of sense of control. We experimentally manipulated sense of control to examine whether there is evidence for its causal role (Spencer, Zanna, & Fong, 2005). We

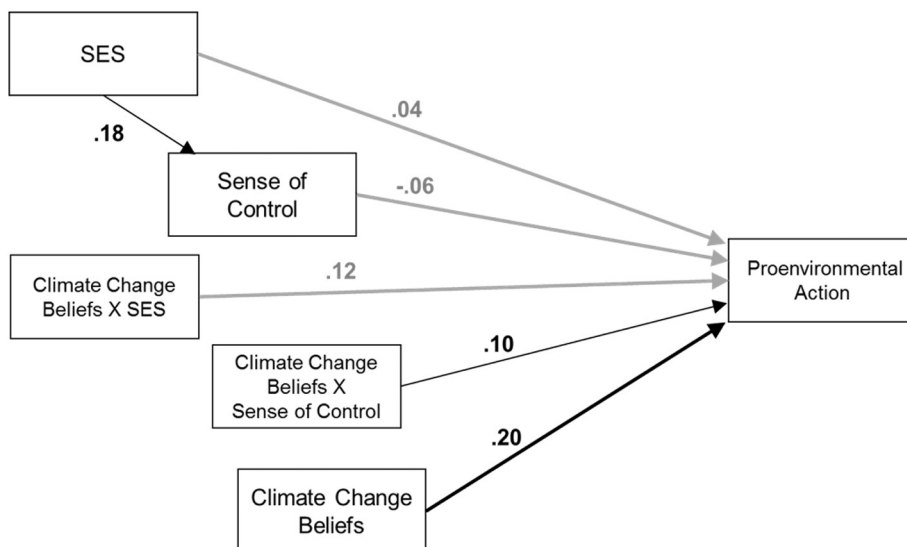


Fig. 3. Path model examining whether sense of control explains the effect of SES on the association between climate change beliefs and pro-environmental action. The values shown are unstandardized path coefficients; black lines represent significant paths (bold line: $p < .01$; thin lines: $p < .05$), and gray lines represent non-significant paths ($p > .05$).

expected that the SES difference in the association between climate change beliefs and pro-environmental action would be attenuated when participants were induced to feel stronger sense of control (high control condition) in particular by boosting the sense of control for lower SES individuals. In the low control condition, however, the prediction was less clear. On one hand, it is reasonable to expect that low sense of control would decrease the link between climate change beliefs and pro-environmental action among both low and high SES participants. On the other hand, previous research has shown that people who generally feel great control over their life outcomes do not necessarily respond to the temporary reductions in control since they can readily recall other memories that counteract the effect of thinking about a specific event with little control (Cutright, 2012; Sullivan, Landau, & Rothschild, 2010). Thus, it was also reasonable to predict that higher SES individuals' tendencies would not change in the low control condition. If so, beliefs about climate change may still predict pro-environmental action more strongly among higher, relative to lower, SES individuals when control was experimentally reduced.

5.1. Method

5.1.1. Participants

Three-hundred seventy one adults (41.2% females; $M_{age} = 33.02$, $SD_{age} = 10.51$) were recruited via Amazon's Mechanical Turk. The majority of participants were European Americans ($n = 293$, 79.0%) followed by Asian Americans ($n = 29$), African Americans ($n = 21$), Latino Americans ($n = 17$), Native Americans ($n = 4$), Other ($n = 4$), and Indians ($n = 1$). Seventy four additional participants who started but did not complete the study were excluded from analyses.

5.1.2. Procedure

Participants first answered questions about their beliefs about climate change. They then completed a short writing task to manipulate their state sense of control. Next, participants indicated the extent to which they intend to perform a range of pro-environmental actions over the next months. Lastly, they completed demographic items including SES measures, and then were thanked and debriefed.

5.1.3. Materials and measures

5.1.3.1. Climate change beliefs. Climate change beliefs were measured by 6 items selected from the scale used in Study 2: "I have already noticed some signs of global warming," "I am quite sure that global warming is occurring now," "Global warming is mainly due to natural causes, not human activity (reverse)," "The main causes of global warming are human activities," "Global warming will bring about some serious negative consequences," and "The consequences of global warming will be more positive than negative overall (reverse)." Considering the writing activity in Study 3, we reduced the number of items to keep the study length under 10 min. Participants reported the extent to which they agree/disagree with each statement on 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). The scores of the 6 items were averaged as a single composite of climate change beliefs ($M = 3.89$, $SD = 0.88$, $\alpha = 0.87$). Higher scores indicated stronger belief in climate change.

5.1.3.2. Socioeconomic status. SES was measured with the combination of personal education attainment and yearly family income. The education level measure used the following six categories: (a) less than high school ($n = 1$, 0.3%), (b) high school graduate ($n = 49$, 13.2%), (c) some college ($n = 105$, 28.3%), (d) associate's degree ($n = 37$, 10.0%), (e) bachelor's degree ($n = 136$, 36.7%), and (f) master's degree or higher ($n = 43$, 11.6%). The median education level was associate's degree. Annual family income was measured by eight categories: (a) under \$15,000 ($n = 44$, 11.9%), (b) \$15,001 to \$25,000 ($n = 56$, 15.1%), (c) \$25,001 to \$35,000 ($n = 56$, 15.1%), (d) \$35,001 to \$50,000 ($n = 69$, 18.6%), (e) \$50,001 to \$75,000 ($n = 75$,

20.2%), (f) \$75,001 to \$100,000 ($n = 32$, 8.6%), (g) \$100,001 to \$150,000 ($n = 29$, 7.8%), and (h) over \$150,000 ($n = 10$, 2.7%). The median income was between \$35,001 and \$50,000. The education and family income were standardized and averaged as an index of SES with higher scores indicating higher SES, $r(369) = 0.29$, $p < .001$.

5.1.3.3. Sense of control manipulation. We manipulated sense of control by employing a recall and writing task used in previous work (Kraus et al., 2009). Participants in the low control condition were asked to recall and describe a situation in which they had *very little control*, whereas those in the high control condition were asked to recall and describe a situation in which they had *a great deal of control*.⁷ The instructions were as follows:

Please recall a particular incident in which you had a great deal of (very little) control; that is, a situation in which you had complete (very little) control of what happened to you and other people around you. Please describe this situation, including what happened, how you felt, etc.

5.1.3.4. Pro-environmental action intention. We measured pro-environmental action intentions as the outcome variable because the temporary change in sense of control is less likely to affect reports of daily pro-environmental actions (the outcome variable used in Study 2). This action intention measure was also expected to be informative about the ways in which sense of control influences the motivation to engage in pro-environmental action consistent with beliefs about climate change. Participants indicated how often they intended to perform a list of six environmentally-friendly actions over the next three months on 6-point Likert-type scale (1 = *never* to 6 = *all the time*) (Zaval, Markowitz, & Weber, 2015). The measure covered a wide range of behaviors, both spending and saving resources, including water/energy conservation ("unplug appliances and chargers (e.g., TV, cell phone, computer) at night"), environmentally-friendly consumption ("buy green products instead of regular products (e.g., dishwashing detergent), even though they cost more"), and political participation ("write letters, email, phone or otherwise contact elected official to urge them to take action on environmental issues (e.g., habitat loss, air pollution)"). The scores of the items were averaged as a single composite of pro-environmental action intentions ($M = 2.87$, $SD = 0.94$, $\alpha = 0.71$), with higher scores indicating stronger pro-environmental action intentions.

5.1.3.5. Demographic covariates. Gender, age, ethnicity, and political orientation were treated as potential covariates. Age and ethnicity were measured by the same items used in Study 2. Again, ethnicity was dummy coded (White = 0; $n = 293$ vs. non-White = 1; $n = 77$). Political orientation was measured by a 7-point scale (1 = *very liberal* to 7 = *very conservative*; $M = 3.21$, $SD = 1.58$).

5.2. Results

To test the main hypotheses, we ran a hierarchical linear regression. At Step 1, SES, mean-centered climate change beliefs, and experimental condition (0 = low control, 1 = high control) were entered as predictors. At Step 2, the two-way interactions between the key factors: climate change beliefs \times SES, climate change beliefs \times condition, and

⁷ We examined whether there was heterogeneous attrition across conditions (see Zhou & Fishbach, 2016 for discussion of this issue in online studies in particular) and there was not. Out of the seventy-four participants who started but did not complete the survey, seven withdrew their participation after the writing task (they did not differ by condition, 3 vs. 4 for high vs. low control). For remaining participants who dropped out before the writing task, the information about whether the attrition rate was systematically different between the two conditions (i.e., drop-out rates by condition) was not available because they were not assigned to condition at that point. Heterogeneous attrition is unlikely given that the final sample sizes between the low ($n = 189$) vs. high control ($n = 182$) conditions were comparable.

condition \times SES interactions were entered as additional predictors. Lastly, at Step 3, the three-way interaction among climate change beliefs, SES, and condition was entered. The outcome variable was pro-environmental action intentions.

At Step 1, there was a significant main effect of climate change beliefs, $\beta = 0.27$, $b = 0.28$, $SE = 0.05$, $t(367) = 5.30$, $p < .001$, 95% CI for $b = [0.18, 0.39]$. Stronger belief in climate change was associated with stronger pro-environmental action intentions. The main effects of SES and experimental condition were not significant, $\beta = -0.01$, $b = -0.01$, $SE = 0.06$, $t(367) = -0.16$, $p = .871$, 95% CI for $b = [-0.13, 0.11]$ for SES; $\beta = -0.08$, $b = -0.15$, $SE = 0.10$, $t(367) = -1.56$, $p = .121$, 95% CI for $b = [-0.33, 0.04]$ for the experimental condition. At Step 2, there was a significant interaction between climate change beliefs and SES, $\beta = 0.11$, $b = 0.13$, $SE = 0.06$, $t(364) = 2.13$, $p = .034$, 95% CI for $b = [0.01, 0.25]$. Replicating the results of the previous studies, belief in climate change predicted pro-environmental action intentions more strongly among higher SES individuals (1 SD above the mean; $\beta = 0.35$, $b = 0.37$, $SE = 0.08$, $t(364) = 4.63$, $p < .001$, 95% CI for $b = [0.21, 0.53]$) relative to lower SES individuals (1 SD below the mean; $\beta = 0.15$, $b = 0.16$, $SE = 0.10$, $t(364) = 1.65$, $p = .099$, 95% CI for $b = [-0.03, 0.35]$). There were no other significant two-way interactions, $\beta = 0.0004$, $b = 0.001$, $SE = 0.11$, $t(367) = 0.01$, $p = .995$, 95% CI for $b = [-0.21, 0.21]$ for the climate change beliefs \times experimental condition interaction; $\beta = -0.02$, $b = -0.04$, $SE = 0.12$, $t(367) = -0.29$, $p = .770$, 95% CI for $b = [-0.27, 0.20]$ for the experimental condition \times SES interaction.

Importantly, these effects were qualified by the significant three-way interaction among climate change beliefs, SES, and experimental condition, $\beta = -0.15$, $b = -0.29$, $SE = 0.12$, $t(363) = -2.35$, $p = .020$, 95% CI for $b = [-0.53, -0.05]$ (see Fig. 4). In the low control condition, there was a significant interaction between climate change beliefs and SES on pro-environmental action intentions, $\beta = 0.21$, $b = 0.25$, $SE = 0.08$, $t(363) = 3.14$, $p = .002$, 95% CI for $b = [0.09, 0.40]$. Essentially, the low control condition mirrored the findings from the previous studies as belief in climate change predicted pro-environmental action intentions only among higher SES individuals (1 SD above the mean), $\beta = 0.39$, $b = 0.43$, $SE = 0.08$, $t(363) = 5.17$, $p < .001$, 95% CI for $b = [0.27, 0.60]$, but not among lower SES individuals (1 SD below the mean), $\beta = 0.04$, $b = 0.04$, $SE = 0.11$, $t(363) = 0.34$, $p = .733$, 95% CI for $b = [-0.18, 0.25]$. Viewed differently, when people held stronger belief in climate change (1 SD above the mean), higher SES individuals showed significantly higher levels of pro-environmental action intentions than lower SES individuals, $\beta = 0.26$, $b = 0.26$, $SE = 0.12$, $t(363) = 2.24$, $p = .026$, 95% CI for $b = [0.03, 0.49]$. In contrast, when people held weaker belief in climate change (1 SD below the mean), higher SES individuals tended to show lower levels of pro-environmental action intentions than lower SES individuals, $\beta = -0.18$, $b = -0.18$, $SE = 0.10$, $t(363) = -1.81$, $p = .071$, 95% CI for $b = [-0.37, 0.02]$.

In the high control condition, however, there was no interactive effect of climate change beliefs and SES on pro-environmental action intentions, $\beta = -0.04$, $b = -0.04$, $SE = 0.10$, $t(363) = -0.46$, $p = .645$, 95% CI for $b = [-0.23, 0.15]$. For both lower and higher SES participants, climate change beliefs significantly predicted the intentions to engage in pro-environmental actions, $\beta = 0.28$, $b = 0.30$, $SE = 0.11$, $t(363) = 2.74$, $p = .007$, 95% CI for $b = [0.09, 0.52]$ for lower SES individuals; $\beta = 0.21$, $b = 0.23$, $SE = 0.11$, $t(363) = 2.10$, $p = .037$, 95% CI for $b = [0.01, 0.45]$ for higher SES individuals. Viewed differently, there were no SES differences when people held either stronger (1 SD above the mean) or weaker (1 SD below the mean) belief in climate change. The key results remained consistent when controlling for ethnicity, sex, age, and political orientations.

5.3. Discussion

Study 3 provides causal evidence for the role of sense of control in driving the SES difference in the association between climate change beliefs and pro-environmental action. In the low control condition, consistent with our previous studies, stronger belief in climate change motivated higher SES individuals more strongly than lower SES individuals to engage in pro-environmental actions. However, this SES difference was eliminated in the high control condition in which individuals were reminded of when they had experienced strong control over their lives. In this situation, lower SES individuals showed similar levels of increased intentions to act according to their belief in climate change as higher SES individuals did. These findings suggest that sense of control is a key causal factor that determines the degree of the link between climate change beliefs and pro-environmental action. Interestingly, the manipulation of state sense of control did not make a difference among higher SES individuals. Whether they were induced to feel low or high sense of control, they intended to behave as though they were in control (see Cutright, 2012; Sullivan et al., 2010).⁸

6. Study 4

Given the consistent finding that climate change beliefs are a weaker predictor of support for climate actions among lower, relative to higher, SES individuals, Study 4 aimed to address an alternative psychological factor that motivates pro-environmental engagement among lower SES individuals. Along with personal attitudes and beliefs, social norms have long been identified as a potent determinant of human behavior (Ajzen, 1991; Asch, 1956; Sherif, 1936). A large body of work in social psychology has been further devoted to examining the powerful influence of the *perceived* social norms—in particular, the perception of what others typically do in a particular context, termed *descriptive norms*—on behaviors (e.g., Cialdini, Reno, & Kallgren, 1990; Göckeritz et al., 2010; Goldstein, Cialdini, & Griskevicius, 2008; Schultz, 1999). When people perceive that others engage in certain behaviors frequently and normally, they are more likely to engage in those behaviors.

The susceptibility to normative influence varies among people from different sociocultural backgrounds (e.g., Savani, Morris, & Naidu, 2012; Savani, Wadhwa, Uchida, Ding, & Naidu, 2015). In particular, individuals with a lower SES background are influenced by descriptive social norms more strongly than individuals with higher SES. For example, individuals with a lower, relative to higher, SES background tend to make more similar choices to others when they know of others' preferences, and feel more positively when others make the same choices as they do (Stephens et al., 2007). Lower SES individuals are also more likely than higher SES individuals to change their original decisions to align them with the preferences of others (Na, McDonough, Chan, & Park, 2016). This tendency is theorized to be a consequence of lower SES individuals being a part of a more interdependent social network necessitated by their social and material conditions (Stephens et al., 2007).

Therefore, we considered perceived descriptive social norms as a potential key factor guiding pro-environmental engagement among lower SES individuals. We hypothesized that perceived descriptive social norms about pro-environmental behavior would predict support for pro-environmental action to a greater extent among lower than higher SES individuals. In contrast, we predicted that beliefs about environmental issues would be more predictive of support for pro-environmental action among higher, relative to lower, SES individuals

⁸ We included a subset of sense of control scale (6 items from Lachman & Weaver, 1998) at the end of the study to see if there was an effect of the manipulation on the sense of control. Neither the main effect of condition nor the interaction between SES and condition were significant. These null effects are probably because the sense of control measure came after the dependent variables.

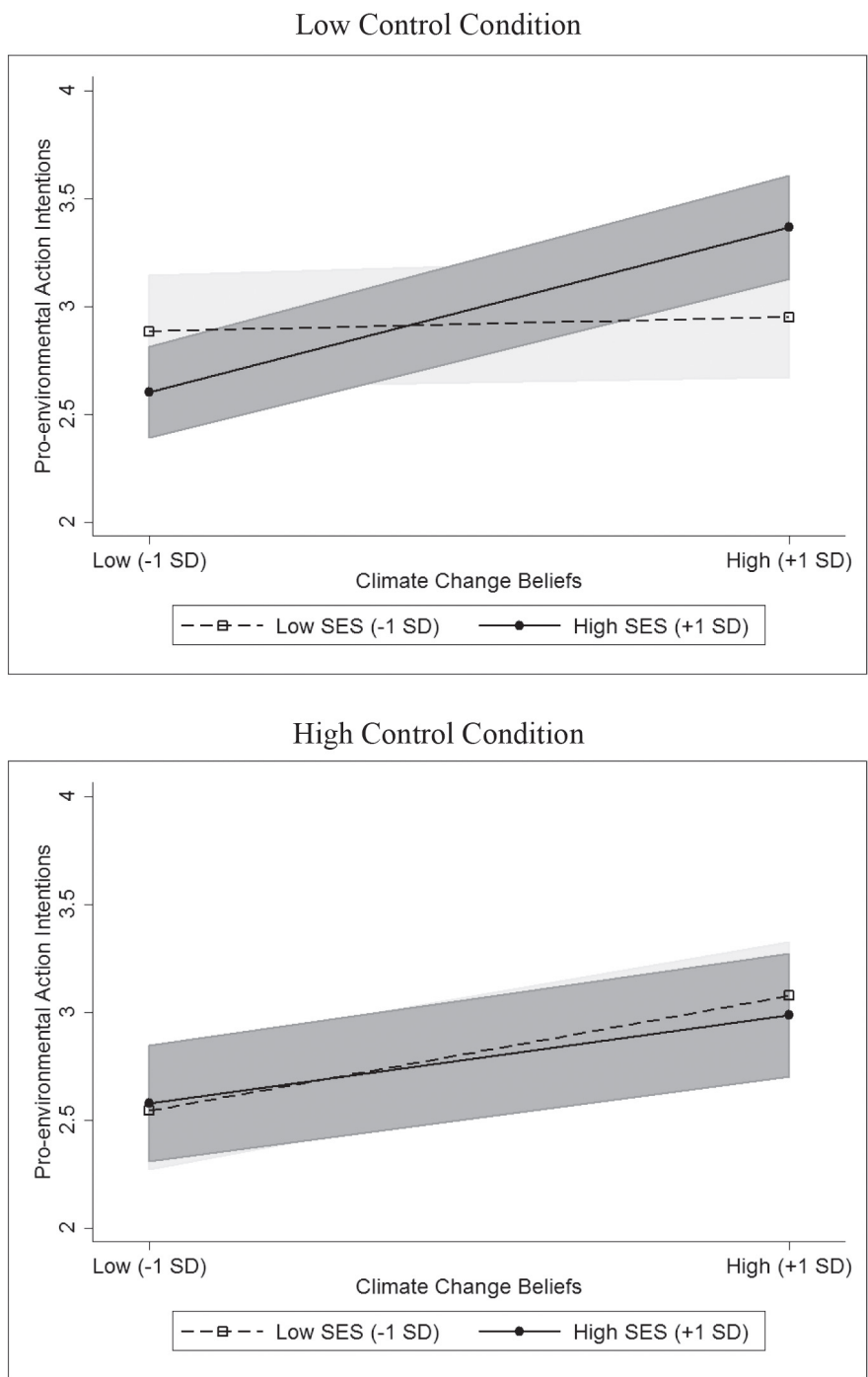


Fig. 4. Pro-environmental action intentions in the low and high control conditions as a function of belief in climate change and SES in Study 3. Shaded areas indicate continuous 95% confidence intervals.

(consistent with Studies 1–3). In Study 4, we also measured the outcome, support for pro-environmental action, in a more concrete way. We asked undergraduate participants whether or not they had donated for a fundraising campaign on campus. Such concrete and binary forced-choice measure can minimize potential confounding factors that occur with Likert-type ratings, such as the reference-group effect (Heine, Lehman, Peng, & Greenholtz, 2002), thereby enhancing the validity of observed group differences.

6.1. Method

6.1.1. Participants

Two-hundred one undergraduate students at a large public university in California (67.7% females; $M_{age} = 20.00$, $SD_{age} = 1.61$) participated in the study. Participants were recruited on campus in exchange for a \$5 gift card. The participants were diverse in terms of their ethnicity: European Americans ($n = 65$, 32.3%), Asian/Asian Americans ($n = 56$, 27.9%), Hispanic/Latino Americans ($n = 47$, 23.4%), African Americans ($n = 12$, 6.0%), Indians ($n = 5$, 2.5%), Native Pacific Islanders ($n = 2$, 1.0%), and Other ($n = 14$, 7.0%).

6.1.2. Procedure

The study was conducted during the fundraising weeks of CALPIRG (California Public Interest Research Group), a student-directed non-profit pro-environmental organization at many public universities in California. This organization runs fundraising campaigns on campus every academic term that request students to pledge \$10 additional quarterly fees for sustainability. Once a student pledges, the sustainability fees are charged to the student's account every term. During the CALPIRG's fundraising weeks, we approached students on the campus to ask them to fill out our questionnaire for a \$5 gift card. The questionnaire included the measures of beliefs about climate change, perceived descriptive norms about pro-environmental behavior, SES, and other demographic items.⁹ When participants completed the questionnaire, the experimenter asked whether they had pledged for the CALPIRG campaign and recorded the information (yes or no).¹⁰ We used this information as a binary outcome measure of pro-environmental action.

6.1.3. Materials and measures

6.1.3.1. Climate change beliefs. Climate change beliefs were measured by the same 6-item scale used in Study 3. The scores of the 6 items were averaged to generate a composite of climate change beliefs ($M = 4.15$, $SD = 0.62$, $\alpha = 0.77$). Higher scores indicated stronger belief in climate change.

6.1.3.2. Perceived descriptive norms about environmental action. Similar to Göckeritz et al. (2010), perceived descriptive norms about pro-environmental action were measured by the following two items: (a) How often do your close others (family and friends) try to act in an environmentally-friendly way (e.g., buying organic, recycled, or biodegradable products, carpooling, saving water and energy, and supporting pro-environmental policies and organization, etc.); (b) How often do the average students (at your university) try to act in an environmentally-friendly way (e.g., buying organic, recycled, or biodegradable products, carpooling, saving water and energy, and supporting pro-environmental policies and organization, etc.)? Responses were made on a 5-point scale ranging from 1 (*never*) to 5 (*always*). The two items were averaged to create a composite of perceived descriptive norms about environmental action ($M = 3.50$, $SD = 0.58$, $r(199) = 0.25$, $p < .001$).

6.1.3.3. Socioeconomic status. SES was measured with the combination of parental education attainment and yearly family income. The parental education level was measured by five categories: (a) less than high school ($n = 30$, 14.9% for father; $n = 22$, 10.9% for mother), (b) high school graduate ($n = 38$, 18.9% for father; $n = 41$, 20.4% for mother), (c) some college or associate's degree ($n = 37$, 18.4% for father; $n = 55$, 27.4% for mother), (d) bachelor's degree ($n = 52$, 25.9% for father; $n = 60$, 29.9% for mother), and (e) master's degree or higher ($n = 42$, 20.9% for father; $n = 23$, 11.4% for mother). The median education level was some college or associate's degree for both father and mother. Yearly family income was measured by the following ten categories: (a) under \$15,000 ($n = 13$, 6.5%), (b) \$15,001 to \$25,000 ($n = 23$, 11.4%), (c) \$25,001 to \$35,000 ($n = 18$, 9.0%), (d) \$35,001 to \$50,000 ($n = 24$, 11.9%), (e) \$50,001 to \$75,000 ($n = 23$, 11.4%), (f) \$75,001 to \$100,000 ($n = 24$, 11.9%), (g) \$100,001 to \$150,000

($n = 20$, 10.0%), (h) \$150,001 to \$200,000 ($n = 24$, 11.9%), (i) \$200,001 to \$250,000 ($n = 11$, 5.5%), and (j) over \$250,000 ($n = 12$, 6.0%). Several participants responded their family income as a range of categories rather than choosing a category. We used a midpoint of the range for those participants. The median income was between \$50,001 and \$75,000. These measures of SES were significantly correlated, $r_s > 0.52$, $p_s < 0.001$, and thus, were standardized and averaged as an index of SES. Higher scores indicated higher SES.

6.1.3.4. Pro-environmental action. Support for pro-environmental action was measured dichotomously by participants' report on whether or not they pledged for the quarterly sustainability fees (\$10). There were 95 participants (47.3%) who pledged (91 who pledged prior to the collection of other measures, 4 who pledged following the description of the program) for the environmental campaign.

6.1.3.5. Demographic covariates. Gender, age, ethnicity, and political orientation were measured as potential covariates. Age and ethnicity were measured by the same items used in previous studies, and ethnicity was dummy-coded (White coded as zero; $n = 65$ vs. non-White coded as one; $n = 136$). Political orientation was measured by a 7-point item (1 = *strongly Democrat* to 7 = *strongly Republican*; $M = 2.94$, $SD = 1.53$).

6.2. Results

We first conducted a logistic regression with climate change beliefs and perceived descriptive norms as simultaneous predictors to examine their significance. Reported donation was treated as the outcome variable. Both factors significantly predicted the probability of donation, $b = 0.52$, $SE = 0.25$, $p = .033$, 95% CI for $b = [0.04, 1.00]$, odds ratio = 1.69 for climate change beliefs; $b = 0.55$, $SE = 0.26$, $p = .035$, 95% CI for $b = [0.04, 1.06]$, odds ratio = 1.73 for perceived descriptive norms. A multiple logistic regression analysis including gender, age, ethnicity, and political orientation as additional factors indicated that perceived descriptive norms still significantly predicted the likelihood of donation, $b = 0.58$, $SE = 0.28$, $p = .034$, 95% CI for $b = [0.05, 1.12]$, odds ratio = 1.80. Belief in climate change became non-significant, $b = 0.46$, $SE = 0.29$, $p = .119$, 95% CI for $b = [-0.12, 1.03]$, odds ratio = 1.58.

We next conducted a logistic regression analysis (a bootstrapping using PROCESS macro in SPSS with 2000 resamples; Hayes, 2013) to examine whether SES would moderate the relationship between climate change beliefs and pro-environmental action. Consistent with our previous studies, there was a significant interaction between belief in climate change and SES on the likelihood of donation, $b = 0.62$, $SE = 0.31$, $z = 1.98$, $p = .048$, 95% CI for $b = [0.01, 1.23]$, odds ratio = 1.86 (see Fig. 5). The stronger belief in climate change was associated with higher likelihood of donation only among higher SES individuals (1 SD above the mean), $b = 1.13$, $SE = 0.40$, $z = 2.84$, $p = .005$, 95% CI for $b = [0.35, 1.91]$. Among lower SES individuals (1 SD below the mean), however, belief in climate change did not predict their probability of donation, $b = 0.07$, $SE = 0.33$, $z = 0.21$, $p = .831$, 95% CI for $b = [-0.58, 0.72]$. The climate change beliefs \times SES interaction remained consistent controlling for age, sex, ethnicity, political orientation as well as perceived descriptive norms, $b = 0.66$, $SE = 0.33$, $z = 2.01$, $p = .044$, 95% CI for $b = [0.02, 1.31]$, odds ratio = 1.94. Viewed differently, when people held stronger belief in climate change (1 SD above the mean), the probability of higher SES individuals' donation was estimated as 67%, whereas the probability of lower SES individuals' donation was 46%, $b = 0.52$, $SE = 0.25$, $z = 2.07$, $p = .039$, 95% CI for $b = [0.03, 1.01]$. When people held weaker belief in climate change (1 SD below the mean), higher SES individuals' probability of donation was estimated as 33%, whereas the

⁹ We also had additional measures of perceived health and financial benefits of pro-environmental behavior and injunctive norms about environmental behavior for exploratory purposes. Given the theoretical focus on pro-environmental beliefs and descriptive norms as predictors of behavior in the present research, we only report results pertaining to those two predictors.

¹⁰ For those who had not heard of the fundraising, the experimenter described it and asked if they would be interested in it. For those who were interested, another experimenter directed them to CALPIRG volunteers. This second experimenter also recorded whether the students ended up pledging (yes or no). Four participants newly pledged following our description of the fundraising.

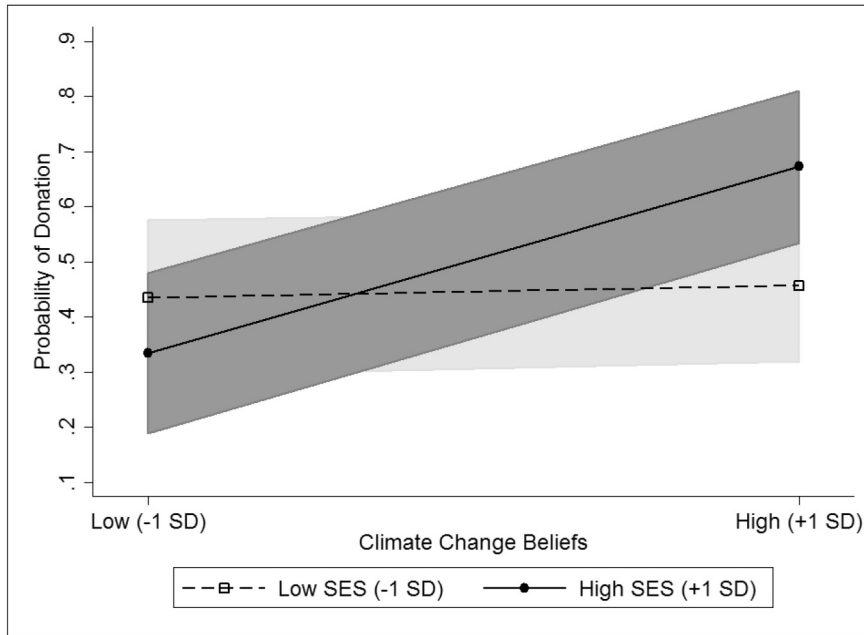


Fig. 5. Probability of donation as a function of belief in climate change and SES in Study 4. Shaded areas indicate continuous 95% confidence intervals.

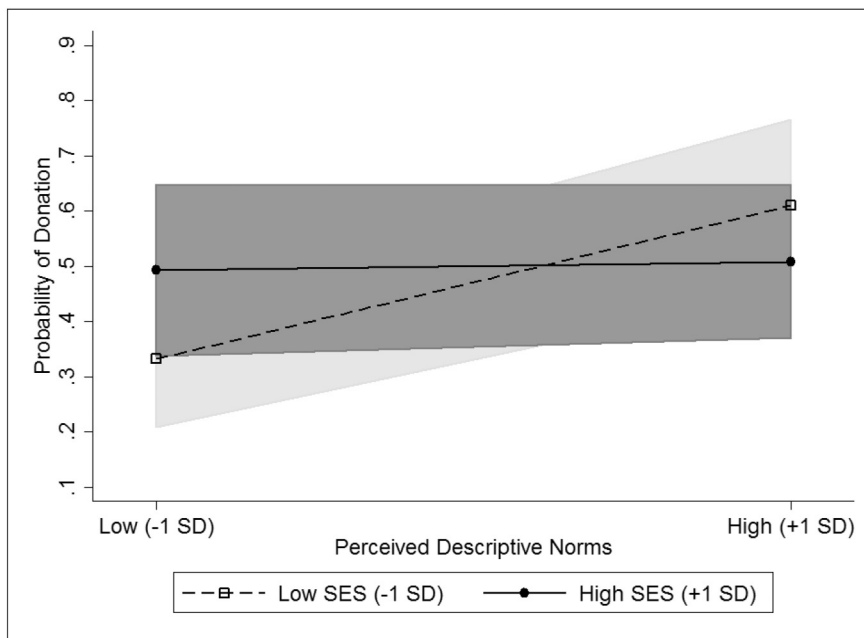


Fig. 6. Probability of donation as a function of perceived descriptive norms about pro-environmental behavior and SES in Study 4. Shaded areas indicate continuous 95% confidence intervals.

lower SES individuals' probability of donation was 43%, $b = -0.25$, $SE = 0.27$, $z = -0.93$, $p = .351$, 95% CI for $b = [-0.77, 0.27]$.

We also examined the moderation effect of SES on the relationship between perceived descriptive norms about pro-environmental behavior and pro-environmental action. A logistic regression analysis (bootstrapping using PROCESS macro in SPSS with 2000 resamples; Hayes, 2013) yielded a marginally significant interaction between perceived descriptive norms and SES on the likelihood of donation, $b = -0.55$, $SE = 0.32$, $z = -1.69$, $p = .092$, 95% CI for $b = [-1.19, 0.09]$, odds ratio = 0.58 (see Fig. 6). The examination of conditional effects revealed patterns that supported the hypotheses. The perceived descriptive norms about pro-environmental behavior positively predicted the probability of donation among lower SES individuals (1 SD

below the mean), $b = 1.00$, $SE = 0.40$, $z = 2.54$, $p = .011$, 95% CI for $b = [0.23, 1.78]$. In contrast, the perceived descriptive norms about pro-environmental behavior did not predict the probability of donation among higher SES individuals (1 SD above the mean), $b = 0.06$, $SE = 0.39$, $z = 0.15$, $p = .882$, 95% CI for $b = [-0.70, 0.81]$. The key interaction pattern remained consistent controlling for age, sex, ethnicity, political orientation, as well as climate change beliefs, $b = -0.57$, $SE = 0.34$, $z = -1.70$, $p = .090$, 95% CI for $b = [-1.23, 0.09]$, odds ratio = 0.57. Viewed differently, when people perceived stronger descriptive norms about pro-environmental behavior (1 SD above the mean), higher SES individuals' probability of donation was estimated as 51%, whereas lower SES individuals' probability of donation was 61%, $b = -0.24$, $SE = 0.26$, $z = -0.90$, $p = .367$, 95% CI for $b = [-0.75,$

0.28]. When people perceived weaker descriptive norms about pro-environmental behavior (1 SD below the mean), higher SES individuals' probability of donation was estimated as 49%, whereas lower SES individuals' probability of donation was 33%, $b = 0.39$, $SE = 0.25$, $z = 1.59$, $p = .111$, 95% CI for $b = [-0.09, 0.88]$.¹¹

6.3. Discussion

Study 4 presented an alternative psychological antecedent of support for pro-environmental action among lower SES individuals. Perceived descriptive norms predicted the reported financial support for the pro-environmental movement on campus only among the students with a lower SES background, but not among those with a higher SES background. We note that we cannot make conclusive inferences about the directionality between the predictor variables and financial support for sustainability because most of the participants had made their decision-making about donation before completing our survey. Nevertheless, the present results are consistent with our theorizing that for higher SES students, personal belief in climate change matters more for their financial commitment for sustainability, but for lower SES individuals, social information matters more for their decision to support the pro-environmental campaign.

7. General discussion

In four studies, we investigated SES differences in antecedents of support for pro-environmental action and their psychological underpinning. We consistently found that climate change beliefs predicted support for pro-environmental action more strongly among higher, relative to lower, SES individuals due to higher SES individuals' greater sense of control over life outcomes. We also identified that perceived descriptive social norms, rather than beliefs about climate change, are a more important predictor of pro-environmental support among lower SES individuals.

We found that the higher SES people who believed strongly in climate change were stronger advocates for environmental policy and reported engaging in more pro-environmental behaviors (relative to lower SES people who believed strongly in climate change), but that the higher SES people, who did not believe in climate change strongly, were consistently stronger advocates *against* climate change policy and engaged in far *fewer* pro-environmental behaviors. Our research suggests two strategies for promoting environmental behavior. For higher SES people who do not believe in climate change, efforts should focus on changing their beliefs, whereas for lower SES people who do believe in climate change, efforts should focus on giving them a greater sense of control over important life outcomes.

It is important to note that our key outcomes were measured by self-reports. Despite the large degree of correlation between self-reported and objective measures of pro-environmental engagement (Kormos & Gifford, 2014), there is still significant non-overlapping variance between the two. We employed diverse measures of pro-environmental support, including policy support, self-reported ratings of daily pro-environmental behaviors, and binary report of a concrete action, to increase confidence in the relevance of current set of findings to actual behavioral domains. Nevertheless, the impact of environmental beliefs and SES on actual environmental behaviors remains an issue that needs

¹¹ We analyzed the data with the two items about descriptive social norms separately due to their weak correlation. Although the general patterns of interaction between perceived norms and SES were consistent, neither the interaction involving the family/friends norm nor the one involving the campus norm was statistically significant; family/friends norm perceptions \times SES interaction ($b = -0.32$, $S.E. = 0.24$, $p = .178$); campus norm perceptions \times SES interaction ($b = -0.34$, $S.E. = 0.27$, $p = .201$). Thus, it is not that the reported results were mainly driven by one of the particular norms. Rather, inclusive normative perceptions encompassing perceived prevalence of environmental behavior among family, friends, and peers seem to interact with SES to predict pro-environmental engagement.

further investigation.

The present research also opens several other intriguing questions for future investigations. First, there may be situations where lower SES individuals are empowered to act according to their attitudes and beliefs. For example, when their attitudes and beliefs are visibly shared with a majority of the society, lower SES individuals, with enhanced sense of agency, may participate in collective actions supporting their beliefs as much as higher SES individuals would. Second, the present research does not address psychological processes connecting beliefs or norms with support for pro-environmental actions. Thus, it remains unknown to what extent individuals are aware of the influence of their pro-environmental beliefs and social norms about pro-environmental behaviors on their behaviors, and whether the degree of awareness itself differs between higher vs. lower SES individuals. These are worthwhile future questions because the answers to these questions will greatly inform potential interventions to increase pro-environmental engagement of the general public.

7.1. Theoretical contributions

Our findings significantly contribute to the literature on psychological underpinnings of pro-environmental action. To date, psychological research on pro-environmental engagement has heavily focused on internal factors, such as attitudes, values, and beliefs related to the environment, and their interrelations to understand pro-environmental behavior (see Eom et al., 2016; Milfont & Page, 2013 for coded-reviews of key research themes in the recent environmental psychology literature). Influential models such as the information deficit model (Burgess, Harrison, & Filius, 1998) and value-belief-norm theory (Stern, 2000) are good examples of such *intrapersonal* approaches.

Although internal factors play significant roles in explaining pro-environmental engagement, how people support and engage in pro-environmental action is also significantly affected by contextual—social, economic, and cultural—factors. Expanding recent research showing great diversity in antecedents of pro-environmental support across national cultures (Eom et al., 2016; Morren & Grinstein, 2016; Tam & Chan, 2017), the present findings further suggest that there is also significant within-nation variation in psychological levers of pro-environmental action according to individuals' socioeconomic status. Little is still known about the ways in which intrapersonal processes and different levels of contextual factors independently and jointly shape the psychology of pro-environmental action. This is an important area for future research (see Pearson et al., 2016 for related discussion).

Our findings also contribute to the literature on the psychology of social class. Although previous evidence showed that higher SES individuals have a stronger lay assumption that action is contingent on internal factors than lower SES individuals (Kraus et al., 2009; Snibbe & Markus, 2005), there has been little investigation into the SES effects in the direct relationship between internal factors and action. The present research fills this gap by showing that personal awareness and beliefs about social issues are more predictive of support and action to address the issues among higher SES individuals.

Consistent with existing literature (e.g., Na et al., 2016; Stephens et al., 2007), we found in Study 4 that lower SES individuals' support for pro-environmental action is more in line with social norms. Having social norms guide action may be an adaptive response to maintain a sense of control in a compensatory manner in low SES contexts with more limited resources. When people encounter situations that threaten personal control, they engage in compensatory strategies to restore a sense of control (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Landau, Kay, & Whitson, 2015; Rothbaum, Weisz, & Snyder, 1982). Emerging evidence suggests that *being a group member*—thinking and acting in terms of group memberships—can be a useful resource to maintain sense of control when facing psychological threat (Kim, Sherman, & Updegraff, 2016). The observed lower SES individuals' tendency to

align their actions with social norms may be an alternative way to have control and assert agency. Future research is needed to examine the direct relationship between lower SES individuals' social conformity and sense of control, as well as other consequences of conformity among lower SES individuals.

8. Conclusion

The present research demonstrates significant variation across individuals, groups, and communities with different socioeconomic backgrounds in terms of how effective educating people about the urgency of environmental problems and the environmental impact of their choices are in generating support for pro-environmental action. Such approaches that aim to increase awareness of environmental problems may be more effective among those with more privileged life circumstances that offer greater sense of control. For those with fewer resources, focusing on social factors—changing perceived and actual social norms about environmental action—may be more effective. As such, for policy makers, activists, and organizations working to increase pro-environmental support, it is crucial to realize that people with diverse backgrounds have different perspectives and priorities, and thus, they may respond to the same policies and interventions in different ways. The success of environmental policies and interventions may depend on understanding the psychology of target groups that the policies and interventions are trying to influence. To successfully combat pressing environmental issues such as climate change requires greater effort to understand the diversity of psychological experience across society.

Open practices

Materials for Studies 2 to 4 are openly available online: <https://osf.io/vn25k>.

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