Who are your people? - The effect of political ideology and global citizen identity on climate-related beliefs and risk perceptions

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Abstract: Persistent divides among American voters regarding climate change, especially climate skepticism among conservatives, have long been explained with reference to ideology, vested interests, and trends of political polarization. More recently, an alternative set of explanations for the opinion gap between conservatives and liberals has been gaining traction, arguing that these divisions are generated by social identities and their effects on individual beliefs and attitudes. Here, we focus on global citizenship as a specific social identity. Seeking to connect ideology and social identity approaches, we study how the interaction between a person's ideological leanings and their social identity as a global citizen relates to beliefs and risk perceptions regarding climate change. Analyzing two kinds of survey data, we find that a global citizen identity moderates the relationship between a conservative ideology and a person's climate-related beliefs and risk perceptions, while it does not seem to have the same effect for liberal individuals. In other words, a global citizen identity is associated with a potential decrease in the ideological divide between conservatives and liberals regarding climate change. We explore the implications of these findings for climate change communication and policy and other issue areas.

Keywords: climate change; social identity; global citizenship; global identity; political ideology

1. Introduction

A growing body of research across multiple disciplines has been seeking to explain the polarized beliefs among Americans regarding climate change. Ideology plays an outsized role in this research (Leiserowitz et al., 2017; Moser & Berzonsky, 2015). Scholars have explored multiple factors that shape ideological effects on climate-related beliefs, such as differences in the moral content of distinct ideologies (Feinberg & Willer, 2013; Haidt, 2013). More recently, an alternative set of theoretical explanations for the persistent opinion gap has received growing attention: social identities, e.g., as citizens of a nation, farmers, or environmentalists (e.g., Eeden et al., 2020), and their effects on political beliefs, attitudes and behaviors regarding climate change (Fielding & Hornsey, 2016).

Despite their shared subject, these two approaches have not yet been brought together. Political ideologies can be defined in many ways and approached from many perspectives, e.g., as a set of political beliefs, a demographic variable, embedded in political institutions or organizational logics. However, political ideologies are also social identities associated with specific groups.

Social identities affect all dimensions of social life, but not all social identities are (equally) politically relevant. For example, identities such as mother or craftsman can shape a person's beliefs and actions and have varying effects on their political orientations. Grappling with this diversity and its effects on politics is important for the development of a fuller understanding of political dynamics. Ideological theories of political attitudes regarding climate change have demonstrated strong explanatory power, but they are oversimplified and not able to capture this more complex reality of political thinking. They tend to treat the landscape of political cognition

in the US by dividing it into two categories – conservative and liberal – assuming that individuals can be located somewhere along this right-left spectrum (Leader Maynard & Mildenberger, 2018). This simplification has been useful, but hides significant differences among adherents to one ideology. It might present a particular obstacle when seeking to mitigate the opinion gaps between conservatives and liberals on various political issues.

The complementarities and tensions between ideology and social identity research raise interesting questions regarding the interaction between ideologies and other social identities (e.g., can one identity (ideology) affect the adoption of others?), and the mechanisms through which each construct affects people's beliefs, values, and behaviors. What is the potential for bridging the gap between the currently distinct scholarly approaches to this subject? Here, we seek to bring these literatures in conversation with a focus on beliefs and risk perceptions regarding climate change.

We focus on global citizenship as a specific social identity that has been credited with fostering pro-environmental attitudes and behaviors (Leung et al., 2015; Reese, 2016). A global citizen identity is defined as "an inclusive group membership with all humans" (Reysen & Katzarska-Miller, 2013, p. 859), and as a superordinate identity it can encompass multiple subordinate (e.g., national) identities. Using two kinds of survey data, we study how the interaction between a person's ideological leanings and their social identity as a global citizen relates to beliefs and risk perceptions regarding climate change.

2. Climate-related beliefs and risk perceptions in American public opinion

2. 1   Ideology and climate cognition

A growing body of literature has provided consistent empirical evidence for a relationship

between a person's political ideology and their beliefs and risk perceptions related to climate

change, including denial, concern, and corresponding (lack of) support for various policy

measures (Leiserowitz et al., 2011; McCright & Dunlap, 2011). The observation that

conservative-leaning individuals are more likely than liberals to engage in climate denial (i.e.,

the rejection of scientific information about the causes and expected impacts of climate change),

are less concerned about climate risks, and less supportive of climate policies holds across

multiple countries (e.g., Leviston & Walker, 2012). This split between conservative and liberal

voters has been particularly prominent in American politics, linked to a broader trend of political

polarization over the last three decades (Dunlap et al., 2016; Farrell, 2016; McCright & Dunlap,

2011).

A range of theories have sought to explain different responses of conservatives and liberals to

climate change, including the strategic actions of powerful actors and interests (Jacques et al.,

2008; Oreskes & Conway, 2011), motivated reasoning (Jost et al., 2003) i.e., reasoning that is

guided "by a goal to reach a specific, desirable conclusion" (Hennes et al., 2020, p. 142), and

distinct moral tendencies of conservatives and liberals (Feinberg & Willer, 2013; Haidt, 2001,

2013). Of particular importance is the effect of cultural value commitments on belief adoption

and change (Crompton, 2011; Kahan & Braman, 2006). The theory of cultural cognition (Kahan,

2012) proposes that a person's beliefs regarding climate change depend on their pre-existing,

deep-seated, cultural worldviews – distinct combinations of beliefs and values that provide a lens

through which reality is perceived. Since any serious attempt to address climate change would

threaten conservative values, such as individualism, private property and free enterprise, small

government, and anti-multilateralism (Jamison, 2010; McCright & Dunlap, 2000), climate denial

serves as a psychological defense mechanisms of prior value commitments.

2.2   *Social identity and climate-related beliefs*

In addition to these psychological and cultural explanations, a growing body of scholarship

builds on social identity theory (Stets & Burke, 2000; Tajfel, 1982) to explain differences in

climate-related beliefs, especially the insight that belonging to a group affects a person's

cognitive processes and behaviors. Different social groups have distinct attributes, including

group-specific beliefs, norms, and behavioral prescriptions. The more a person identifies with a

group, i.e., self-categorizes as a group member (Turner & Reynolds, 2011), the more they adopt

these group-specific beliefs and adhere to its norms (Reysen & Katzarkska-Miller, 2013, p. 860).

These cognitive, emotional, and behavioral consequences of identifying with a group are called

social identity effects and include attitudinal changes regarding in- and out-group members,

alignment of risk perceptions, application of in-group norms (Fielding & Hornsey, 2016; Hogg,

2016), and the adoption of uniform behaviors (Stets & Burke, 2000).

A number of cognitive processes provide the foundation for these social identity effects,

including perceptions of similarity to other group members and the corresponding "feelings of

greater closeness" as well as "increased feelings of responsibility" for their welfare (Levine et

al., 2005, p. 444). Shared group membership renders the experiences of other people personally

relevant because group members are perceived to be similar to oneself - what happens to them could happen to oneself. As Running (2013, p. 281) hypothesizes, "It may be that individuals who share a common social identity are more concerned with other group members' interests because they consider them linked to their own, even interchangeable."

Social identity effects can serve as a mechanism for expanding a protective circle of care to strangers, countering other psychological dynamics, especially distancing. Psychological distancing is a tendency to believe that certain risks affect others more than oneself, especially others distant in space, e.g., in other countries, and time, e.g., future generations (Spence et al., 2012). If individuals adopt an inclusive social identity, their attitudes and behaviors can change based on their identity-based relationship to other perceived group members. If individuals from two identity groups in conflict, i.e.., conservatives and liberals, adopt the same superordinate identity, i.e., as Americans or global citizens, the social identity effects can under certain circumstances ameliorate their differences.

Individuals generally have multiple, overlapping social identities at different social scales (Crisp & Hewstone, 2007), including a national, professional, ideological, and sometimes global citizen identity (Reysen & Katzarska-Miller, 2013). Different identity groups have distinct sets of norms and values with significant implications for risk perceptions, decisions and behaviors. To the extent that different social identities prescribe different beliefs or actions, a person's actual thought or behavior depends on the most salient identity in a particular set of circumstances (Hornsey, 2008; Chung, 2022; Unsworth & Fielding, 2014).

These social identity effects have important implications for climate change politics. A person's social identity as a member of a party, the holder of a specific ideology, or citizen of a country affects their beliefs regarding climate change, e.g., aligning their levels of concern with those of other group members (Fielding & Hornsey, 2016) or offering support for individuals affected by climate-related events (Levine et al., 2005), such as hurricanes or wildfires. For example, based on a person's identity as an American, they should experience concern for hurricane victims in Florida, even if they live in Oregon. However, they would not be as concerned about victims of the same hurricane in the Bahamas. Further, the person's ideology-based identity would shape their beliefs regarding the relationship between climate change and the hurricane, and the utility of climate policies for preventing future hurricanes. Hence, Bliuc et. al. (2015) suggest that the climate-related division between conservatives and liberals is best understood as a conflict between two groups with different socio-political identities.

2.3   *A global citizen identity and climate change*

Scholars have become increasingly interested in the link between superordinate social identities, and climate-related beliefs and behaviors (Fielding & Hornsey, 2016; Running, 2013). Superordinate identities might have a unifying effect in contentious political contexts because of their ability to elevate shared values and beliefs among members of antagonistic groups (Batalha & Reynolds, 2012; Gaertner et al., 1999). There are multiple terms for global-scale social identities, such as a cosmopolitan, human or Earth citizen identity, or more generally, a common human in-group (Reese, 2016). Many of these global-scale identity constructs have emerged along with globalization dynamics over the last half century, and corresponding trends in

education and development (Osler & Starkey, 2003). Some scholars use different labels for an all-inclusive identity for humanity interchangeably, while others differentiate these and argue that each of these has different identity attributes and content. For example, Reysen and Katzarska-Miller (2013, 2017) find distinct pro-social values associated with the social identity as a human compared to a global citizen or international citizen.

Here, we focus on global citizenship as a category that includes all humans as members, based on an appreciation of one's connectedness to others around the world. The concept has roots in cosmopolitanism (Osler & Starkey, 2003) and the notion of citizenship as a relationship that generates rights and responsibilities to others. Reysen and Katzarska-Miller define global citizenship as "awareness, caring, and embracing cultural diversity while promoting social justice and sustainability, coupled with a sense of responsibility to act" (2013, p. 858), integrating attitudes, values, and specific action tendencies. They distinguish two sets of antecedents – the conditions enabling the adoption of a global citizen identity: a person's awareness of the various ways in which their lives are tied to others around the world (Pavey et al., 2011), and a supportive "normative environment", e.g., a circle of friends or network of colleagues that confirms and agrees with the norms and values associated with global citizenship.

As a meaningful category of self-identification, a global citizen identity has a specific set of consequences (effects), i.e., it possibly predicts a series of political beliefs, attitudes and behaviors. These include valuing other cultures (Haydon, 2006), a social justice orientation, and environmentalism (Davies, 2006; Leung et al., 2015). Reysen and Katzarska-Miller provide evidence for these consequences, collectively described as "endorsement of group content",

including "pro-social values, intergroup empathy, valuing diversity, social justice, environmental sustainability, intergroup helping and feeling a responsibility to act for the betterment of the world" (2013, p. 858). They demonstrate a correlation between a global citizenship identity and pro-social or pro-environmental behaviors such as community service and recycling. There is evidence for increased cooperative behavior – contributions to global public goods beyond self-interest – as a consequence of a global-scale, inclusive identity (Buchan et al., 2011), increased support for human rights (McFarland et al., 2012) or global charity (Reese et al., 2015). Some of these identity effects hold across different nationalities (Katzarska-Miller et al. 2012). Given these various findings, global citizens likely believe in the reality of global climate change, support actions that mitigate climate impacts, including global cooperation to achieve climate stability, and would help other global citizens negatively affected by climate change.

While these studies are indicative of a link between a global citizen identity and climate-related beliefs and perceptions, they remain – with exceptions (e.g., Devine-Wright et al. 2015) – largely disconnected from the expansive research on ideology and climate change. Here, we begin to fill this gap, focusing on the question of how the interaction between political ideology and global-citizen identity affects individuals' beliefs and risk perceptions regarding climate change.

2.4   *Theory and hypotheses*

Conceiving of political ideology as one of multiple social identities a person can have, we are interested in the interaction between political ideology (e.g., as a Conservative or a socialist) and global citizenship among American voters. Each social identity has a different 'content', i.e.,

group specific beliefs, values, norms, and behavioral prescriptions. Some social identities, including most political ideologies, contain 'rules' regarding appropriate cognitive, emotional and behavioral responses to climate change. In some instances, the climate-related rules associated with two different identities held by the same person can contradict each other. Depending on which identity is most salient in a particular context or circumstance, the individual will identify relevant in-group members and applicable identity content accordingly.

We hypothesized that a global citizen identity can be distinctly associated with the climate-related beliefs and risk perceptions of conservatives and liberals. We distinguish beliefs in the reality, anthropogenic causes, and negative impacts of climate change, i.e., the acceptance of scientific statements about the nature of climate change as true, and risk perceptions in the sense of value-based assessments of the severity of expected climate impacts.

Regarding beliefs about the reality, causes and impacts of climate change, we expected that conservatives who self-categorize as global citizens align their beliefs with those of other perceived global citizens, reporting stronger beliefs in the anthropogenic nature of climate change and its negative consequences compared to conservatives without a global citizen identity. We did not expect such an effect for liberals because among American liberals, trust in science and belief in the anthropogenic causes of climate change are already high and well aligned with internationally prevalent beliefs (Flynn et al., 2021; Leiserowitz et al., 2021). In other words, a global citizenship identity is expected to exhibit alignment effects only for conservatives, with conservative global citizens reporting higher beliefs in the reality of climate change than the average across all conservatives.

We expected that both conservatives and liberals who identify as global citizens experience climate change risks as more severe compared to individuals without this identity. This hypothesis is based on a number of assumptions regarding the social identity effects of global citizenship and the psychological mechanisms at work. First, the inclusion of human beings all around the world in the in-group of global citizens extends their concern to people far away, making these distant peoples' experiences of climate change impacts personally relevant. Consequently, more people in climate harm's way are included in one's circle of care, including those already exposed to significant impacts today, e.g., inhabitants of small island states or subsistence farmers in the developing world. Importantly, this extended circle of care would include people who are exposed to different types of climate risk than the global citizen's fellow Americans, including the existential risk of losing nationhood. Second, caring for the human community and for global sustainability might affect a person's concern about unique global ecosystems outside of one's own country ('common human heritage') that are threatened by climate change, such as the Amazon Rainforest or the Arctic. It might also create concern about the health of the world's oceans, a generally underappreciated climate impact among citizens. Third, global citizens might care more for the poorest people on Earth, i.e., those in the least developed countries, who tend to be the most vulnerable to climate change. Hence, multiple psychological mechanisms might be at work to extend the global citizen's circle of care beyond a national scale in-group.

A limited number of past studies have observed this social identity effect of increased climate change concern, but without specifying the psychological mechanism. Running (2013, p. 377),

for example, used data from the World Values Survey and found that "identification as a world citizen increases the odds an individual judges global warming to be very serious, ….". Using a combination of interview data and surveys with participants of the international climate change negotiations, Milkoreit (2017) also observed that individuals with a more inclusive (i.e., cosmopolitan or human) identity tended to have more severe threat perceptions regarding climate change.

Both the literature on ideology and climate change and the research on social identity and climate-related beliefs tend to assume that the causal arrow moves from a person's identity to their beliefs and perceptions regarding climate change. In other words, climate change beliefs are considered a consequence of ideology or a social identity effect. However, it is possible that the causal direction is reversed, i.e., that certain beliefs about climate change contribute to the adoption of a social identity. For example, a person who experiences concern about people in Bangladesh affected by sea-level rise, and realizes how their own behaviors and carbon emissions contribute to the plight of Bangladeshis, might start to consider themself a global citizen because of their beliefs about climate change. This possibility has implications for research design, e.g., the order in which respondents are presented with specific questions, and the interpretation of our findings, i.e., to what extent correlations can support different suggestions about causality. Similar discussions exist regarding the relationship between direct experiences of the impacts of climate change and belief in climate change (e.g., Myers et al., 2013). While we cannot exclude the possibility of social identity emergence (esp. global citizenship) because of participants' prior response to survey questions about climate change, we believe that the adoption of social identities and political ideologies is a slow process that

requires social conditions over extended time periods, which is unlikely to occur during a brief

online survey.

3. Materials and methods

To examine the climate-related beliefs and perceptions of people who self-identify as global

citizens and have different ideological attachments, we analyzed two sets of data. First, we

conducted a college student survey with a nonrepresentative convenience sample of students at

an American research university. Second, we used a subset of the World Values Survey (WVS)

data, which is based on sample that is representative of the US population, for added external

validity.

The college student survey was conducted in November 2017. We recruited 312 university

students with posters and flyers in the main campus library, offering a financial reward of $8 for

participation in a research study. We obtained voluntary and informed consent from participants.

Students took about 15 minutes to complete the survey in a computer lab on campus.

WVS data for this study come from the 2005–2009 wave conducted with American respondents.

This is the most recent WVS data that includes measures on personal identification as a global

citizen and perceived seriousness of global warming. The most recent WVS data from the 2010–

2014 wave did not include these measures. We restricted data to just American respondents

(N=1,249) as our main goal was to assess how a global citizen identity interacts with political

ideology with regard to beliefs and perceptions on climate change, and the meaning of political

ideology can vary by country, i.e., what it means to be politically liberal or conservative can have

very different implications in countries with different political culture, and different systems of

governance, economics, or welfare.

3.1   Measures

Our study considered two dependent variables of interest: climate change beliefs and perceived

seriousness of climate change.

(a) College student survey

To measure beliefs regarding the causes and consequences of climate change, the college student

survey invited participants to express their agreement or disagreement with six statements (e.g.,

Higher emissions of greenhouse gases will lead to higher temperatures.; see Appendix for

details)* on a 5-point Likert scale. We combined participants' responses to these questions using

the Cronbach's alpha and scaled the newly generated variable to range from 0 to 1.[1] A reliability

test across the six items delivered an alpha of .757.[2]

To test perceived seriousness of climate change, we invited participants to read a short news

report in which scientists explained Hurricane Irma was affected by climate change. Then

respondents were asked two questions regarding their perceived seriousness of the issue they had

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[1] The "alpha" function in STATA generates the summative scale from the items (variables) specified by computing interitem correlations and Cronbach's alpha. The items that correlated negatively with the rest of the items (2 and 3 above) were reversed.

[2] For added robustness, we also created a latent variable of climate change beliefs combining the 6 survey items using a confirmatory factor analysis via structural equation modeling. Tests conducted on this latent variable confirm our main results on the effect of global citizenship and political ideology on climate change beliefs, adding confidence to our findings. Appendix 2 shows the factor loadings in the new variable and these tests results.

read about, and the severity of threats related to climate change. Responses were provided on a

5-point Likert scale (not serious/severe at all – very serious/severe). The responses to these two

questions were also combined into one variable using Cronbach's alpha, and then scaled 0 to 1

for simplicity of comparison.

(b) World Values Survey

The WVS measured only one of our two dependent variables: perceived seriousness of climate

change. Respondents were invited to indicate how serious they considered "Global warming or

the greenhouse effect" to be for the world as a whole on a 4-point Likert scale. While the

wording is slightly different from the question asked in our survey, we believe asking about

perceived seriousness of global warming or the greenhouse effect is a reasonable proxy to

capture perceived seriousness about climate change.

In contrast to previous research that collapsed the four response options into binary categories

(Running, 2013), we use data in each of their four categories in their ordinal entirety. This

enables us to examine the data without losing detailed information on differences across the

spectrum of perceived severity of climate change. In addition, grouping Likert items into

dichotomous categories involves subjective and empirical evaluation of valid cut points along the

ordinal scale.

3.2   Independent variables

We considered two independent variables: political ideology and global citizenship

identification. Political ideology was measured in both our college student survey and the WVS

with a self-report question. The college student survey used a four-point Likert scale from very

liberal to very conservative; the WVS asked participants use a 1-10 scale from Left to Right (see

Appendix).

Similarly, both surveys used a self-report question to measure global citizen identity. Our college

student survey created a binary measure with response options *Yes / No / I don't know*. The WVS

used a 4-point Likert scale to record responses to the following question: "People have different

views about themselves and how they relate to the world. Would you indicate how strongly you

agree or disagree with each of the following statements about how you see yourself?"

Respondents indicated their agreement with the statement, "I see myself as a world citizen."

The global citizen identity question was administered after the questions regarding climate

change. The purpose of this order was to avoid a social desirability bias (Krumpal, 2013), i.e., an

effect of the question about global citizenship – if administered first – on participants' responses

to questions about climate change based on their perceptions of global citizenship as a desirable

attribute. It is possible that this order of questions might have triggered the adoption of a global

citizenship identity following a reflection on climate change among some participants. As noted

above, while this effect of survey design cannot be excluded, it is an unlikely occurrence, and in

our case less worrying than the social desirability bias.

3.3   *Descriptive analyses*

The descriptive statistics of the samples in both surveys, as well as the metrics of the key

variables are presented in Table 1.

[Table 1 here]

A number of factors have been established as positively associated with climate change beliefs or

concern for the environment in existing literature. These include level of education (McCright &

Dunlap, 2011; Olofsson & Öhman, 2006), age (Jones & Dunlap, 1992; Liere & Dunlap, 1980),

and sex, where females have been shown to generally express more environmental concern

(Zelezny et al., 2000). Considering the general homogeneity of educational attainment and

narrow distribution of age in our convenience sample, only sex is controlled for in analyses of

our college student survey.

4. Results

4.1 *College student surveys*

Using a two-way ANOVA analysis, we explored our interaction hypotheses. Analysis of the

college student survey data reveals that self-identification as a global citizen moderates the effect

of political ideology on both beliefs and perceived seriousness of climate change. Table 2

summarizes these results.

[Table 2 here]

(a) Climate change beliefs

The relationship between political ideology and climate change beliefs differed for those who identified as a global citizen and those who did not [$F(3,173)=2.899$, $p=.037$, partial η2=.048]. An analysis of simple main effects for political ideology was performed with statistical significance receiving a Bonferroni adjustment and accepted at the $p<.025$ level. There was a statistically significant difference in climate change beliefs for global citizens at each of the four political ideology scales [$F(3,173)=3.720$, $p=.013$, partial η2=.061], as for non-global citizens [$F(3,173)=12.612$, $p<.0005$, partial η2=.179].

Figure 1 graphs the relationship between global citizen identification, political ideology, and climate change beliefs. Confirming our expectations, we find that individuals who self-identified as conservatives and global citizens report more belief in the reality and anthropogenic causes of climate change than conservatives without a global citizen identity. This effect held for those who identified as "very conservative" with significantly higher beliefs in climate change (.970±.132) than non-global citizens (.530±.060, 95%CI: .157, .725), [$F(1,173)=9.248$, $p=.003$, partial η2=.051]. Global citizenship increased climate change beliefs for people who self-identified as somewhat conservative, although this difference was not statistically significant.

Based on our survey data we also confirmed that global citizenship does not significantly affect liberals' climate change beliefs. Liberals' climate change beliefs remained consistently high when compared to conservatives, whether they identified as global citizens or not.

However, when comparing people who identified as global citizens[3] with those who did not identify as global citizens[4], this gap across political ideologies disappeared. Among people who did not identify as global citizens, very conservative individuals reported mean climate change beliefs .414 lower than very liberal individuals (p<.0005), .354 lower than somewhat liberal individuals (p<.005), and .186 lower than somewhat conservative individuals (p=.050). Among global citizens, mean climate change beliefs reported by very conservative individuals were not statistically significant compared to very liberal, liberal individuals, or somewhat conservative individuals.

[Figures 1-2 here]

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[3]Among people who identified as global citizens, the means of climate change beliefs no longer changed in order along the ideological spectrum. Mean climate change belief scores for very liberal, somewhat liberal, somewhat conservative, and very conservative global citizens were .922±.038, .902±.024, .756±.042, and .970±.132, respectively. The global citizen identity narrowed the gap of very liberal and somewhat conservative citizens' climate change beliefs. Very liberal global citizens had a higher mean "climate change beliefs" than somewhat conservative global citizens (.166, 95%CI: .014, .318, p=.024), a narrower gap compared to the .227 among non-global citizens. Somewhat liberal global citizens also still reported a higher mean of climate change beliefs than somewhat conservative global citizens, .146 (95%CI: .016, .275), p=.018, but this gap was smaller than between non-global citizens who were somewhat liberal and somewhat conservative (.168).

[4] Among non-global citizens, climate change beliefs decreased from higher to lower levels along the ideological spectrum when moving from very liberal to very conservative. Mean "climate change beliefs" scores for very liberal, somewhat liberal, somewhat conservative, and very conservative individuals were .943±.057, .884±.033, .716±.038, and .530±.060, respectively. Even when not identifying as global citizens, liberals still overall reported higher means of climate change beliefs compared to conservatives. Specifically, very liberal individuals had a higher mean of climate change beliefs than somewhat conservative individuals, with a mean difference of .227 (95%CI: .044, .410), p=.007, and very conservative individuals, .413 (95%CI: .190, .635), p<.0005. Somewhat liberal individuals also reported a higher mean of climate change beliefs compared to somewhat conservative individuals, .168 (95%CI: .034, .302), p=.006, and very conservative individuals, .354 (95%CI: .173, .535), p<.0005.

(b) Perceived severity of climate change

We found a statistically significant interaction between a global citizen identity and political ideology regarding risk perceptions of climate change [$F(3,173)=3.019$, $p=.031$]. There was a statistically significant difference in perceived severity of climate change for non-global citizens at either very liberal, somewhat liberal, somewhat conservative, or very conservative levels of political ideology [$F(3,173)=11.869$, $p<.0005$, partial $\eta2=.171$], but not for global citizens [$F(3,173)=1.081$, $p=.358$, partial $\eta2=.018$]. In other words, for those who identified as global citizens, political ideology did not make a statistically significant difference for their perceptions regarding the severity of climate change.

Our findings also confirm the hypothesis that self-identified conservatives who also identify as global citizens perceive climate change risks as more severe than conservatives without a global citizen identity. Conservatives who reported they held a global citizen identity perceived significantly higher severity of climate change compared to conservatives who did not share the global-scale identity. Among somewhat conservative individuals, global citizens a had mean severity score of .792±.038 compared to .685±.035 for non-global citizens. Very conservative global citizens had a mean "perceived severity of climate change" score of .875±.119. The score for non-global citizens was .555±.054 (95%CI: .062, .578), [$F(1,173)=5.993$, $p=.015$, partial $\eta2=.033$].

As expected, the perception of global citizenship was not significantly correlated with liberals' perceptions of the seriousness of climate change. Individuals who identified as very liberal

$[F(1,173)=.004$, p=.947, partial η2 = .000], and somewhat liberal $[F(1,173)=.225$, $p=.636$, partial η2=.001], were consistent in their perceived severity of climate change regardless of whether they held a sense of global citizenship or not.

Among people who identified as global citizens, there were no statistically significant differences across any of the political ideologies. Figure 2 graphs the effects of political ideology on perceived severity of climate change for global citizens and non-global citizens.

4.2   World Values Survey

To test people's perceived seriousness of global warming or the greenhouse effect by political ideology and global citizen identification using WVS data, we used ordered logit models.

Table 3 presents the main results of political ideology and global citizen identity on perceptions regarding the severity of climate change among American participants in the WVS data.

[Table 3 here]

Conservatives with stronger global citizen identification reported global warming or the greenhouse effects as more serious. The significant interaction term of political ideology and global citizen identity suggests that global citizenship moderates the relationship between

political ideology and perceived seriousness of global warming or the greenhouse effect.[5]

Respondents' sex, age, and education did not have statistically significant effects in our model.[6]

Next, we estimated predicted probabilities and marginal effects at each of the four ordered levels of the outcome variable (perceived seriousness of global warming or the greenhouse effect) but focus our report below on the extreme ends of the response spectrum ("not serious at all" and "very serious"). Since political ideology was measured on a scale from 1 to 10 (left to right), we only report the predicted probabilities for political ideology at levels 1(very liberal), 5 (moderate), and 10 (very conservative) for each of the four levels of global citizen identification.

(a) *"Global warming or the greenhouse effect is not serious at all" (low climate change severity)*

Among very conservative individuals (10 on the 1-10 ideology scale), the probability of reporting low climate change severity decreased with an increasingly strong global citizen identity. The probability was 49.2% ($p<.0005$, 95%CI: .306, .678) for very conservative individuals, who strongly disagree that they are global citizens. That number drops to 21.6% ($p<.0005$, 95%CI: .120, .312) for those who moderately disagree that they are global citizens, and down to 15.9% ($p<.0005$, 95%CI .093, .225) for those who moderately agree that they are global citizens. Finally, when very conservative people agreed very strongly that they were

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[5] The interaction term is statistically significant at the 90 percent confidence level.
[6] Graphs that plot the ordered logit model in Table 3, as well as a similar model that uses a binary measure of global citizen identification for improved visibility, are included in the appendix.

global citizens, the probability that climate change severity was low dropped to a mere 5.9%

(p=.003, 95%CI: .020, .098).

In contrast, very liberal individuals (1 on the 1-10 ideology scale) were consistently highly

unlikely to report low climate change severity, regardless of their level of global citizen identity.

The probability of a very liberal individual who strongly disagreed they were global citizens

reporting low climate change severity was not statistically significant (1.8%, p=.172, 95%CI:

-.007, .044). Very liberal people who disagreed, agreed, and strongly agreed they were global

citizens reported low climate change severity with a .7% (p=.006, 95%CI: .002, .012), .8%

(p<.0005, 95%CI: .003, .013), and .08% (p=.007, 95%CI: .002, .014) probability, respectively.[7]

(b) "Global warming or the greenhouse effect is very serious" (high climate change severity)

We confirm the hypothesis that self-identified conservatives who also identify as global citizens

perceive climate change risks as more severe than conservatives without a global citizen identity.

Individuals who strongly reject a global citizen identity report high climate change severity with

a probability of just 3.4%. However, for very conservative individuals who just weakly disagree

that they were global citizens, this probability rises to 11.1%. Finally, for very conservative

individuals who agreed, or strongly agreed, that they were global citizens, this probability is

15.4% and 35.3% respectively.

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[7] Moderates (5 on the 1-10 ideology scale) measured in between the extreme conservatives and liberals. The stronger they indicated a global citizen identity, the less likely they were to report that global warming or the greenhouse effect were not serious at all. Throughout the range of moderates who strongly disagreed to strongly agreed (4 scale) of having a global citizen identity, the probability they reported global warming or the greenhouse effect as not serious at all decreased, from 9.7% (p=.003, 95%CI: .034, .160), 3.5% (p<.0005, 95%CI: .023, .047), 3.2% (p<.0005, 95%CI: .023, .042), and finally 2% (p<.0005, 95%CI: .012, .027), respectively.

In contrast, very liberal individuals were generally consistent in reporting perceptions of high climate change severity, regardless of their level of global citizen identity. The probability of very liberal individuals, who strongly disagreed that they were global citizens, reporting high climate change severity was still high at 65.1%, $p<.0005$, 95%CI: .326, .975). Very liberal people consistently reported high climate change severity across different levels of global citizen identification, with individuals who disagreed they were global citizens reporting high climate change severity with a probability of 82.5% ($p<.0005$, 95%CI: .732, .917), individuals who agreed they were global citizens at 80.1% ($p<.0005$, 95%CI: .724, .876), and those who strongly identified as global citizens at 80.4% ($p<.0005$, 95%CI: .698, .909). Combined analyses from WVS and our college student survey hence provide no evidence for the hypothesis that global citizenship increases liberals' perceived seriousness of climate change.[8] The self-categorization as a global citizen does was not significantly correlated with liberals' perceptions on climate change.

5. Discussion

Our analysis revealed that a global citizen identity has significant interaction effects with a conservative ideology, associated with both greater beliefs and severity perceptions of conservative participants regarding climate change. However, we did not observe any interaction

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[8] Moderates were in between the extreme conservatives and liberals, but still were more likely to report global warming and the greenhouse effect as very serious the stronger their global citizen identity. Moderates who strongly disagreed, and disagreed, that they were global citizens each had a 24.3% ($p<.0005$, 95%CI: .114, .371) and 48.4% ($p<.0005$, 95%CI: .425, .544) probability of reporting that global warming and the greenhouse effect were very serious. Moderates who agreed, and strongly agreed, that they were global citizens, reported with a 50.4% ($p<.0005$, 95%CI: .460, .547) and 62.6% ($p<.0005$, 95%CI: .562, .690) probability that global warming and the greenhouse effect were very serious, respectively.

effects between political ideology and global citizen identity for liberals. This pattern begins to shrink the opinion gap between conservatives and liberals regarding the reality and severity of climate change. How can we explain this difference between social identity interaction effects among conservatives and liberals?

5.1 Conservatives

We started with the assumption that individuals hold multiple, overlapping social identities, each associated with a different social group and providing cognitive and behavioral guidance through group-specific patterns of beliefs, norms and values. The observed interaction effects for conservatives could be the result of a salience-based switch between two social identities and the corresponding selection of relevant in-groups: either all conservative-leaning American citizens (an in-group based on ideological affiliation) or all humans or global citizens on Earth (an in-group based on a global citizen identity). Each of these groups maintains different patterns of beliefs and risk perceptions regarding climate change. When the group 'American conservatives' is salient, the individual would experience doubts regarding the reality of climate change and reject the idea that climate change presents significant risks to Americans. When humanity becomes their salient in-group, the pattern of beliefs and risk assessments changes. In this group, climate change is generally considered a reality, and some people in the world – members of the group of global citizens – are believed to be subject to severe climate risks.

To align these two belief systems, individuals who hold both identities might believe that climate change – if real - only affects people in other countries, but not in the US. This belief pattern –

assuming only people far away could be affected by climate change – would be a typical result

of geographical distancing (Spence et al., 2012). In one instance, these distant climate risk

bearers are conceived as non-Americans and hence outside the circle of care. In another instance,

these individuals are part of the in-group of humans, and their experience of severe climate risk

is considered personally relevant for a conservative American global citizen.

To better understand this differentiated interaction effect, future research should explore the

relationship between political ideology and global citizenship as distinct social identities held

simultaneously by the same individual. Research by Brewer (1999) indicates that there are at

least three different ways to conceive of the relationship between distinct social identities,

including separate, joint/compound and nested super- and sub-ordinate identities (see Figure 3).

[Figure 3 here]

While an inclusive global citizen identity could be a superordinate (nested) identity (panel c in

Figure 3), the relationship in the case we study here is more likely compound (panel b in Figure

3), which is "defined by joint membership in both group A and group B" (Brewer, 1999, p. 190)

but without complete overlap of the group members. Since not all conservatives think of

themselves as global citizens, and there are global citizens who are not conservative Americans,

ideology is not sub-ordinate to a global citizen identity. According to Brewer, "When both A and

B are large social categories such joint or compound identities may emerge to serve needs for

distinctiveness as well as inclusion." (1999, p. 190). Ultimately, the nature of this relationship

and its effects on individual group members' beliefs and behaviors invites further empirical

investigation.

5.2 Liberals

Individuals who self-categorize as liberals and global citizens did not differ significantly from

liberals without a global citizen identity regarding the strength of their beliefs in the reality and

human causes of climate change. This absence of a social identity interaction is likely due to a

strong alignment between the belief patterns (e.g., reality and importance of climate change) and

values (e.g., environmentalism, cultural diversity, action-orientation) of both identity groups.

Regardless of the salient identity, liberal American global citizens would indicate strong beliefs

in the reality of climate change. In some sense, this observation is similar to a ceiling effect –

very strong beliefs in climate change among liberals cannot be strengthened by the adoption and

salience of a global citizen identity.

The absence of an interaction effect on liberals' climate risk perceptions can be explained in a

similar fashion. Severity perceptions among liberals are generally high, and our news story about

the impacts of Hurricane Irma might have highlighted the potentially devastating effects of

climate-related events on Americans as well as non-Americans. While we expected liberals to

experience a geographical distancing, i.e., perceiving climate risks to be more severe in far-away

places, such as the disappearance of low-lying island states, they might consider climate impacts

in the US to be as severe as those elsewhere. This generally elevated concern among liberals

might also be subject to a ceiling effect – the interaction with a global citizen identity was not associated with different risk perceptions in a significant way.

6. Conclusion

In this study, we began to bring together research on social identity and political ideology as variables affecting the beliefs and risk perceptions of Americans regarding climate change. Using two sets of survey data, our analyses revealed that the social identity as a global citizen has the potential to narrow the ideological gap between conservatives and liberals, as global citizens reported stronger beliefs and severity perceptions of climate change among conservatives.

We speculate that the reason for this interaction effect between the two social identities – as global citizen and conservative – can be found in (i) the different social groups associated with these identities – humanity is a larger, more inclusive in-group that contains individuals who are at severe risk from climate change – and (ii) differences in belief patterns, values, and risk assessments between these two groups. When the global citizen identity is salient, it can (at least temporarily) reduce or override conservative cognitive tendencies, with individuals reporting greater beliefs in the reality of climate change and risk perceptions. In contrast, a global citizen identity was not significantly correlated with liberals' beliefs and perceived severity of climate change because the beliefs, values, and risk perceptions of American liberals are strongly aligned with those of global citizens when it comes to climate change and environmental issues more generally.

More research is needed to confirm these initial findings and explore the questions they raise. First, future work should develop creative methodological approaches to the identification and measurement of global citizenship identity without using a self-report question. This would avoid the problem of 'identity generation' during a survey process that also asks respondents to think about the global implications of climate change. Second, methodological alternatives are also needed to disentangle in more detail the relationship between global citizenship and beliefs about climate change while maximally decoupling identity cues from partisan cues. The latter – removing the salience of political ideology – would decrease the chances of finding a link to global citizenship, rendering a potential result like ours more convincing. This could be achieved, for example, with survey designs that use respondents' geographical location and present them with vignettes about people and events at varying distances, from local-immediate to distant but national to very distant/in other countries. Third, future work could explore in more depth which components – ideas or values – in the conservative ideology and the global citizen identity create the interaction of the two. Both qualitative work and experimental research designs could advance knowledge generation on this subject. Our research also raises questions regarding the cognitive management and potential resolution of conflicts between the two social identities. Future work could also explore the effects of a global citizen identity on opinion dynamics in other important policy fields, such as immigration and national security.

We assumed that the interaction between different social identities would affect climate-related beliefs and perceptions of survey participants, but also considered the possibility of causal effects working in either direction. Future research could address these questions, possibly with

experiments, or research designs that temporarily separate the measurement of social identities and climate-related beliefs or by reversing the order in which we presented survey questions to participants. Future studies could measure global citizenship first and differentiate more explicitly between different kinds and geographies of climate impacts to explore the specific psychological mechanisms at work in more detail (e.g., general global climate impacts vs. more severe impacts on distant groups vs. impacts on unique global ecosystems).

Our findings support arguments made previously (e.g., Fielding & Hornsey, 2016; Reese, 2016) regarding the potential benefits of fostering global citizen education and identity formation as an avenue to increasing engagement with climate change and corresponding policy support among the American public. They also have implications for effective public climate change communication and framing. Concern for people affected by climate change can become personally relevant if it is perceived through an inclusive social identity lens, for example, that of a global citizen, which renders distant climate victims as group members, who deserve protection and care. Finally, our findings also raise the challenging question of whether fostering a global citizenship identity among conservative Americans should become a key objective of political actors, how this could be approached, and under what conditions such efforts would have a reasonable chance of success.

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	Source			
Variable	Our Surveys		2006 World Values Survey	
Dependent Variables	Metric	Mean (SD)	Metric	Mean (SD)
Climate Change beliefs	0-1, 6 items combined	.844 (.200)		
Perceived Seriousness of Climate Change / Global Warming	0-1, 2 items combined	.811 (.185)	1-4, not serious at all to very serious	3.226 (.905)
Independent Variables				
Global Citizen Identification	0=No, 1=Yes	.56 (.497)	1-4, not at all to very much	2.835 (.816)
Political Ideology	1-4, very liberal to very conservative	2.16 (.811)	1-10, left to right	5.70 (1.787)
Controls				
Education	(University student sample)		1-9, no education to university degree	5.81 (1.341)
Age	In years	20.66 (3.248)	In years	45.90 (16.889)
Sex	1=Male, 2=Female	1.5 (.501)	1=Male, 2=Female	1.52 (.40)
Number of obs.		312		1249

Table 1. Descriptive Statistics and Metrics of Variables

1

Perceived seriousness of global warming or the greenhouse effect	Coef	(SE)
Political Ideology	-.224**	(.069)
Global Citizen (Base: Strongly Agree)		
Strongly Disagree	-.573	(.928)
Disagree	.322	(.563)
Agree	.101	(.500)
Political Ideology*Global Citizen		
Political Ideology*Strongly Disagree	-.217†	(.129)
Political Ideology*Disagree	-.180†	(.094)
Political Ideology*Agree	-.120	(.085)
Sex (Male)	-.173	(.113)
Age	.003	(.003)
Education	-.035	(.043)
Cut1	-4.797*	(.570)
Cut2	-3.216*	(.556)
Cut3	-1.425*	(.550)
Prob>chi2	.000	
N	1,179	

Ordered logit. **p<.01, *p<.05, †p<.1

Table 3. Perceived seriousness of global warming or the greenhouse effect on political ideology and global citizen (4 categories)
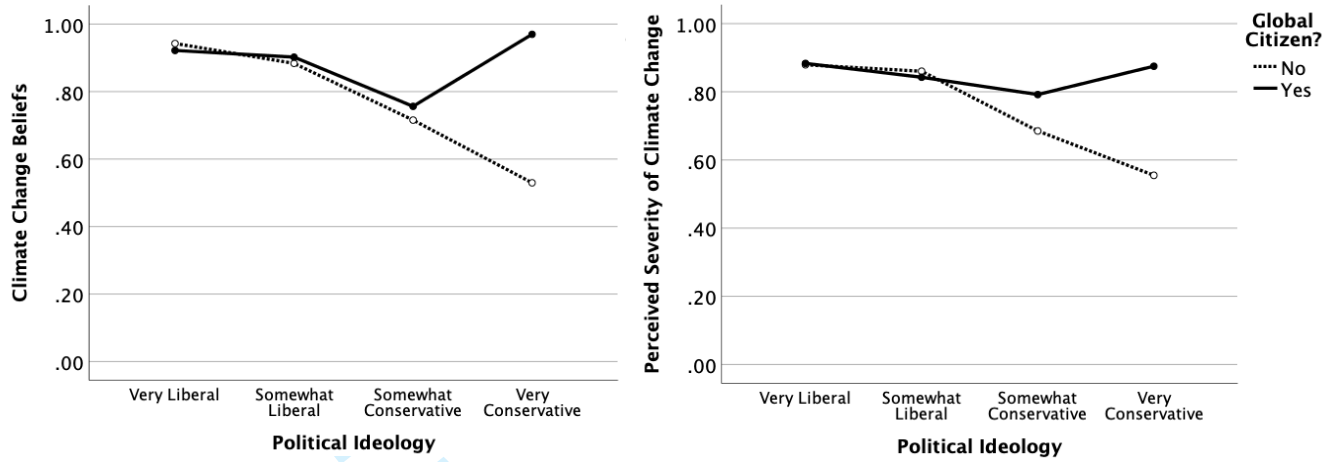
Figures 1-2. Climate change beliefs and perceived severity of climate change by political ideology and global citizen identity
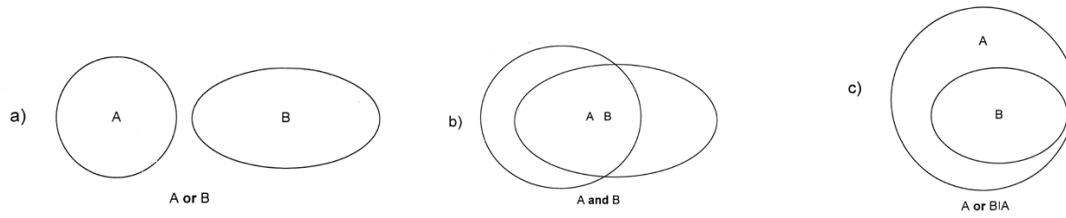
Figure 3. Three types of social identity relationships: (a) separate, (b) compound, (c) nested. Based on Brewer 1999.

Online Appendix

Appendix 1. Survey items

Climate change beliefs

To measure beliefs regarding the causes and consequences of climate change, the college student

survey invited participants to express their agreement or disagreement with the following six

statements:

1. The amount of carbon dioxide in the atmosphere has increased sharply since the Industrial

Revolution. [correct]

2. Variation in solar activity is responsible for the majority of the observed warming in the past

century. [incorrect]

3. Higher emissions of greenhouse gases will lead to higher temperatures. [correct]

4. Climate change is independent of the amount of carbon dioxide in the atmosphere. [incorrect]

5. Greater global warming will have negative consequences for human wellbeing. [correct]

6. Greater global warming will have negative consequences for Americans. [correct]

Participants' response options were *Definitely yes, Probably yes, Might or might not, Probably*

not, Definitely not.

Perceived severity of climate change

To measure perceived seriousness of climate change, we invited participants to read a short news

report that introduced the impact and aftermath of Hurricane Irma. The article noted how

scientists explained Irma was affected by climate change. Then respondents were asked the

following two questions:

- How serious do you think is the problem you just read about?

   Rate your perceived seriousness on a scale from 0 to 5, where higher scores indicate more

    seriousness.

	0	1	2	3	4	5	
Not serious at all (0)							Very serious (5)
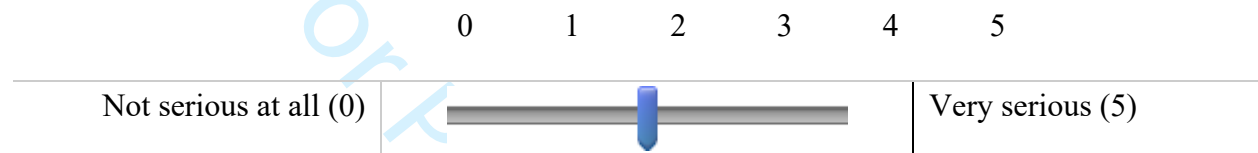
- Events like Hurricane Irma are examples of extreme weather related to the climate.

    How severe are the threats posed by these climate-related events?

    Please rate the severity on a scale from 0 to 5, where higher scores indicate more severity.

	0	1	2	3	4	5	
Not severe at all (0)							Very severe (5)
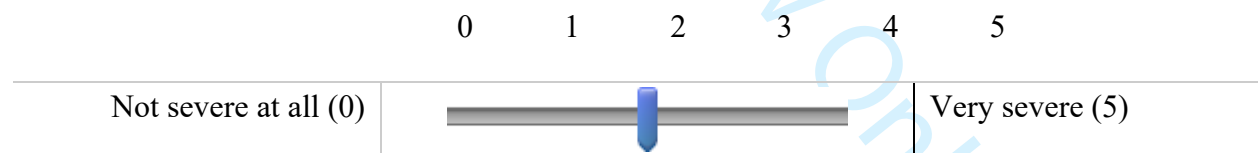
Global citizen identity

To measure whether respondents considered themselves to be global citizens, we asked the

question, *"Would you say you are a global citizen?"* The response options given were *Yes, No,*

and *I don't know*. Following the most common approach of treating Don't know (DK) responses

in analysis, we treated DK responses as user-missing data (Hay et al., 2015, Waters et al., 2013).

Appendix 2. Climate change beliefs variable created by confirmatory factor analysis via structural equation modeling

The following shows a test using a latent variable of "climate change beliefs" (instead of the test shown in the main text, which uses alpha). The latent variable was created by confirmatory factor analysis, then scaled to 1.

First, Table A reports the results of a structural equation model of climate change beliefs.

Parameter Estimate	Unstandardized		Standardized	
Measurement Model Estimates				
CCB → Q39	1.000		.745**	(.035)
CCB → Q40	.300*	(.126)	.149*	(.061)
CCB → Q41	1.332**	(.112)	.846**	(.031)
CCB → Q42	1.026**	(.133)	.474**	(.050)
CCB → Q43	.931**	(.089)	.663**	(.039)
CCB → Q44	1.009**	(.098)	.658**	(.040)
Error in Q39	.216*	(.025)	.444*	(.053)
Error in Q40	1.074*	(.087)	.978*	(.018)
Error in Q41	.191*	(.034)	.285*	(.053)
Error in Q42	.981*	(.084)	.775*	(.048)
Error in Q43	.299*	(.029)	.560*	(.052)
Error in Q44	.361*	(.035)	.568*	(.052)
Covariance Q40 and Q42	.327**	(.063)	.319**	(.053)
Covariance Q43 and Q44	.270**	(.039)	.645**	(.038)

Note: Prob>x^2=.314, x^2(7)=8.221; GFI = .989; CFI = .999; RMSEA = .024

Table A. Unstandardized, standardized, and significance levels for structural equation model of climate change beliefs (CCB), standard errors in parentheses; N = 311

Table B shows the results of a two-way ANOVA using the latent variable of climate change

beliefs as our outcome instead. The findings are very similar to the test in the main test, which

reconfirms and strengthens our results.

Variables	Climate Change Beliefs	
	Coef.	(SE)
Political Ideology (Base: Very Conservative)		
Very Liberal	.414**	(.083)
Somewhat Liberal	.355**	(.068)
Somewhat Conservative	.186**	(.071)
Global Citizen	.441**	(.145)
Political Ideology*Global Citizen		
Very Liberal*Global Citizen	-.461**	(.160)
Somewhat Liberal*Global Citizen	-.423**	(.150)
Somewhat Conservative*Global Citizen	-.400*	(.155)
Sex (Male)	-.003	(.029)
Constant	.534**	(.081)
N	182	
R^2	.259	

Two-way ANOVA. **$p<.01$, *$p<.05$, †$p<.1$.

Table B. Results from tests using climate change beliefs variable created by confirmatory factor

analysis via SEM are very similar to climate change beliefs Y additive (using alpha)

Appendix 3. Correlation between political ideology and global citizen identity, college student survey

Table C summarizes the correlation between self-declared political ideology and global citizen identity in the college student survey. Among those who self-identified as politically conservative (87 respondents), 37.9% (33 respondents) answered that they also held a global citizen identity. Compared to this, 126, or 63.3% of self-declared liberals (out of a total of 199 self-declared liberals) held a global citizen identity.

Table C below shows the distribution of respondents across the 4 levels of political ideology and whether or not they believe they hold a global citizen identity. The Mann-Whitney Test indicates that the correlation between political ideology and global citizen identity is statistically significant.

Political Ideology (PI))		Global Citizen Identity (GCI)		
		No	*Yes*	*Total*
Very Liberal	% within PI	36.2	63.8	100.0
	% within GCI	16.7	23.1	20.3
Somewhat Liberal	% within PI	36.9	63.1	100.0
	% within GCI	41.3	55.6	49.3
Somewhat Conservative	% within PI	55.7	44.3	100.0
	% within GCI	31.0	19.4	24.5
Very Conservative	% within PI	82.4	17.6	100.0
	% within GCI	11.1	1.9	5.9
Total	% within PI	44.1	55.9	100.0
	% within GCI	100.0	100.0	100.0
Mann-Whitney Test	U			12364.0
	p-value			.0001

Table C. Correlation between self-declared political ideology and global citizen identity

Appendix 4. Graphs of climate change beliefs and perceived seriousness by global citizen

identity and political ideology, using measured political ideology (not self-report)

In our surveys, we also included a number of items that aimed to measure political ideology in a

different way from self-reporting. For this we measured one's cultural worldview along the

scales of hierarchy and individualism, a related but separable measure of beliefs from the liberal-

conservative dimension (Douglas and Wildavsky, 1983; Kahan, 2012).

People in our society often have different opinions about the extent to which individuals should

be able to make decisions for themselves. How strongly do you agree or disagree with each of

these statements? (Strongly agree / Agree / Somewhat agree / Neither agree nor disagree /

Somewhat disagree / Disagree / Strongly disagree)

1. The government interferes too much in our everyday lives.

2. Sometimes the government needs to make laws to keep people from hurting themselves.

3. It's not the government's business to try and protect people from themselves.

4. The government should stop telling people how to live their lives.

5. The government should do more to advance society's goals, even if that means limiting the

freedom and choices of the individuals.

6. Government should put limits on the choices individuals can make so they don't get in the way

of what's good for society.

People in our society often disagree about issues of equality and discrimination. How strongly

do you agree or disagree with each of these statements?

1. We have gone too far in pushing equal rights in this country.

2. Our society would be better off if the distribution of wealth was more equal.

3. We need to dramatically reduce inequalities between the rich and the poor, whites and people

of color, and men and women.

4. Discrimination against minorities is still a very serious problem in our society.

5. It seems like blacks, women, homosexuals, and other groups don't want equal rights, they just

want special rights just for them.

6. Society as a whole has become too soft and feminine.

In general, our findings still hold with this continuous measure of ideology, with global citizen

identities boosting climate change beliefs and perceived seriousness of climate change for

conservatives. Our findings from the main text on liberals also held here, as the liberals (unlike

conservatives) consistently reported higher levels of boosting climate change beliefs and

perceived seriousness of climate change regardless of whether they held a global citizen identity

or not. The interaction of political ideology and global citizen identity however was not

statistically significant for climate change beliefs, although directionally the results were

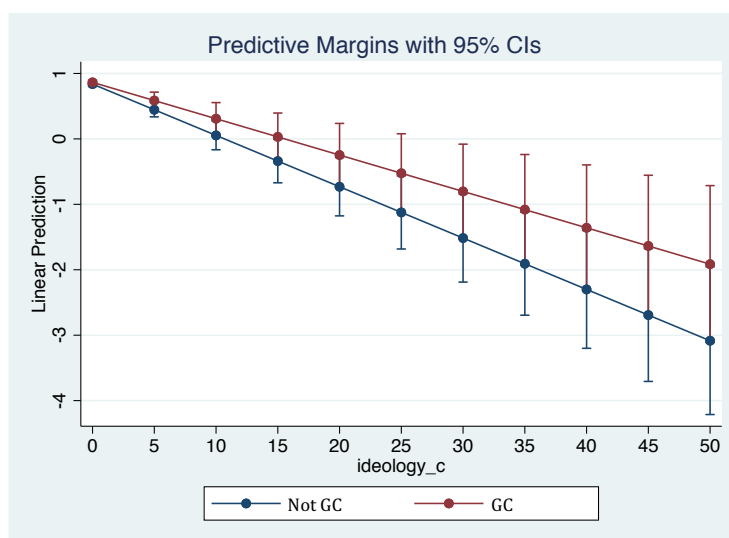consistent with the tests in the main text that use self-reported ideology.

Figure A. Climate change beliefs on global citizen identity and measured political ideology
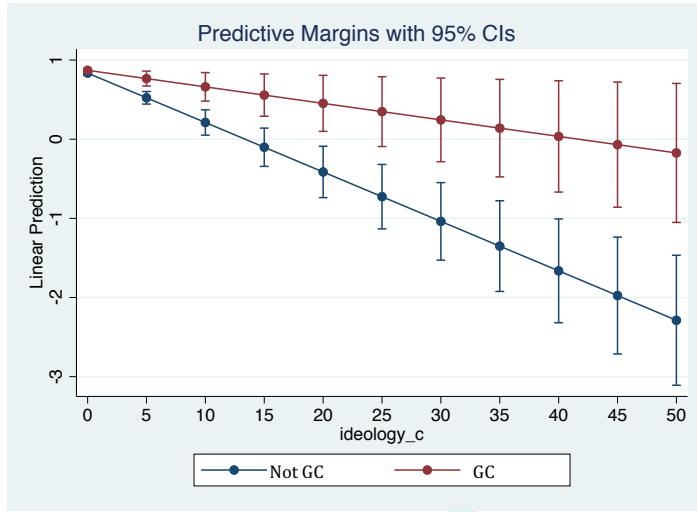
Predictive Margins with 95% CIs

Figure B. Perceived seriousness of climate change on global citizen identity and measured

political ideology

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Appendix 5. Ordered logit graphs, WVS data

As the interaction term of global citizen identify and political ideology was statistically

significant in our ordered logistic regression tests of the WVS data, we plotted the expected

probabilities that the outcome ("perceived seriousness of global warming and the greenhouse

effect") would be each of the values (ranging from 1=not serious at all to 4, very serious) for the

range of global citizen identification (from 1 to 4, where 4 is the strongest and used as the

baseline here) for various values of political ideology (from 1=left to 10=right). Figures A to D

show these graphs.
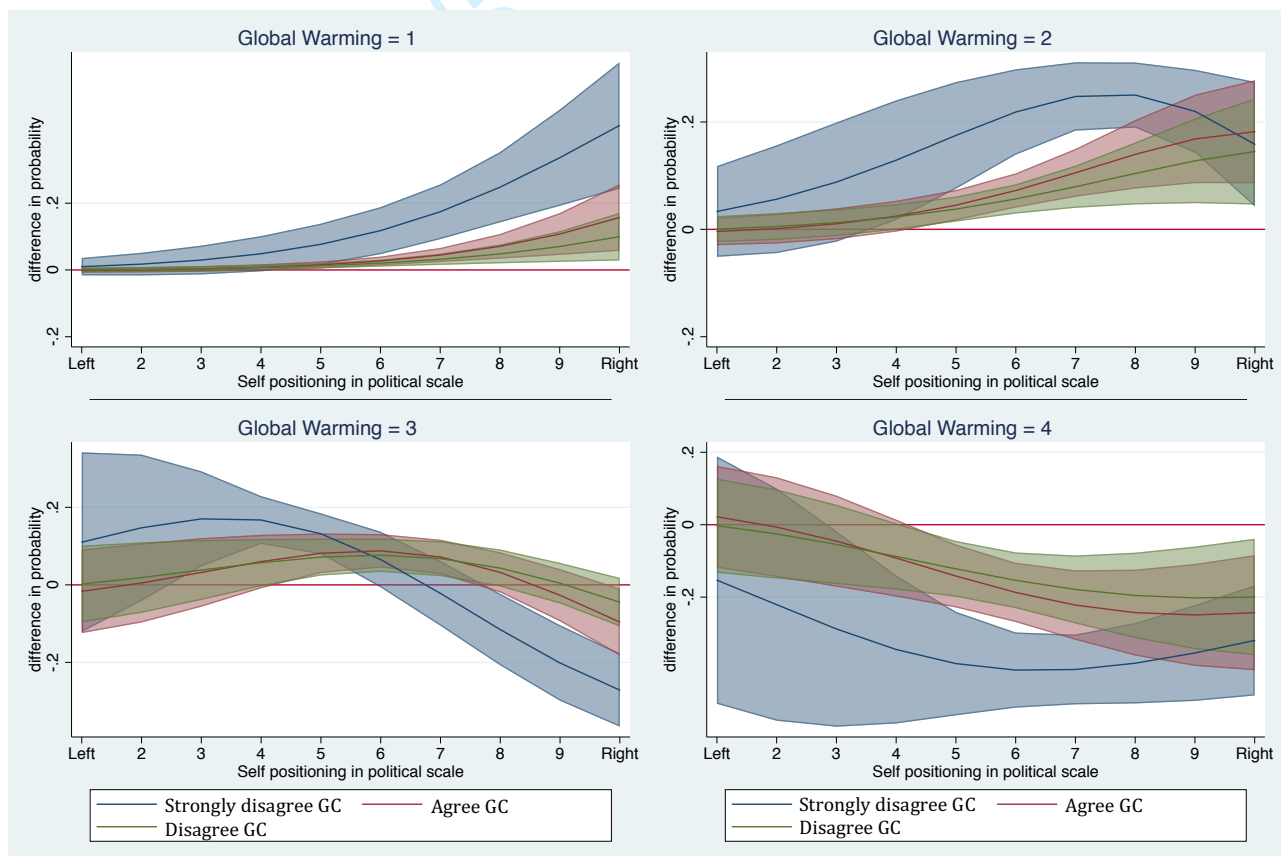
Figures C-F. Ordered logit graphs: perceived seriousness of global warming or the greenhouse

effect on political ideology and global citizen identity

As shown in the four graphs, the patterns of predicted probabilities for the four vales of

"perceived seriousness of global warming or the greenhouse effect" are very different. In the first

graph, Figure C, or where the DV=1 (i.e. "not serious at all"), the pattern trends up toward the

right (i.e. more conservative ideology) with those who report the weakest identification as a

global citizen (shown in blue) as having the higher probabilities. In the second graph (Figure E,

labeled Global Warming=2, i.e. "not very serious") as well, it can be observed that individuals

with weakest global citizen identities (blue, followed by pink areas) who are more conservative

generally trend upwards.

In the third graph (Global Warming=3, or "somewhat serious", Figure E), the lines of the

predicted probabilities cross over one another. Among people with the weakest global citizen

identity (in blue), political liberals tended to report "global warming or the greenhouse effect" as

"somewhat serious,", but as people became more conservative, the predicted probability for

these non-global citizens to report global warming and the greenhouse effect as somewhat

serious dropped. For those with stronger global citizen identities however, the predicted

probabilities for Global Warming=3 remained largely consistent across ideologies.

Finally, Figure F shows that individuals with the weakest global citizen identity (in blue) showed

a lower predicted probability of reporting that global warming or the greenhouse effect is "very

serious." However, it should be noted that liberals with a stronger global citizen identity show a

higher predicted probability across political ideologies.

We show results of the test with binary global citizen as well, for better visibility in plots.

Perceived seriousness of global warming or the greenhouse effect	Coef	(SE)
Political Ideology	-.469**	(.055)
World Citizen	-.536	(.418)
Political Ideology*World Citizen	.166*	(.067)
Sex (Male)	-.204†	(.112)
Age	.004	(.003)
Education	-.046	(.043)
Cut1	-5.274*	(.523)
Cut2	-3.743*	(.500)
Cut3	-1.989*	(.490)
Prob>chi2	.000	
N	1,179	

Ordered logit. **p<.01, *p<.05, †p<.1.

Table D. Perceived seriousness of global warming or the greenhouse effect on political ideology and global citizen identity (dichotomously coded)
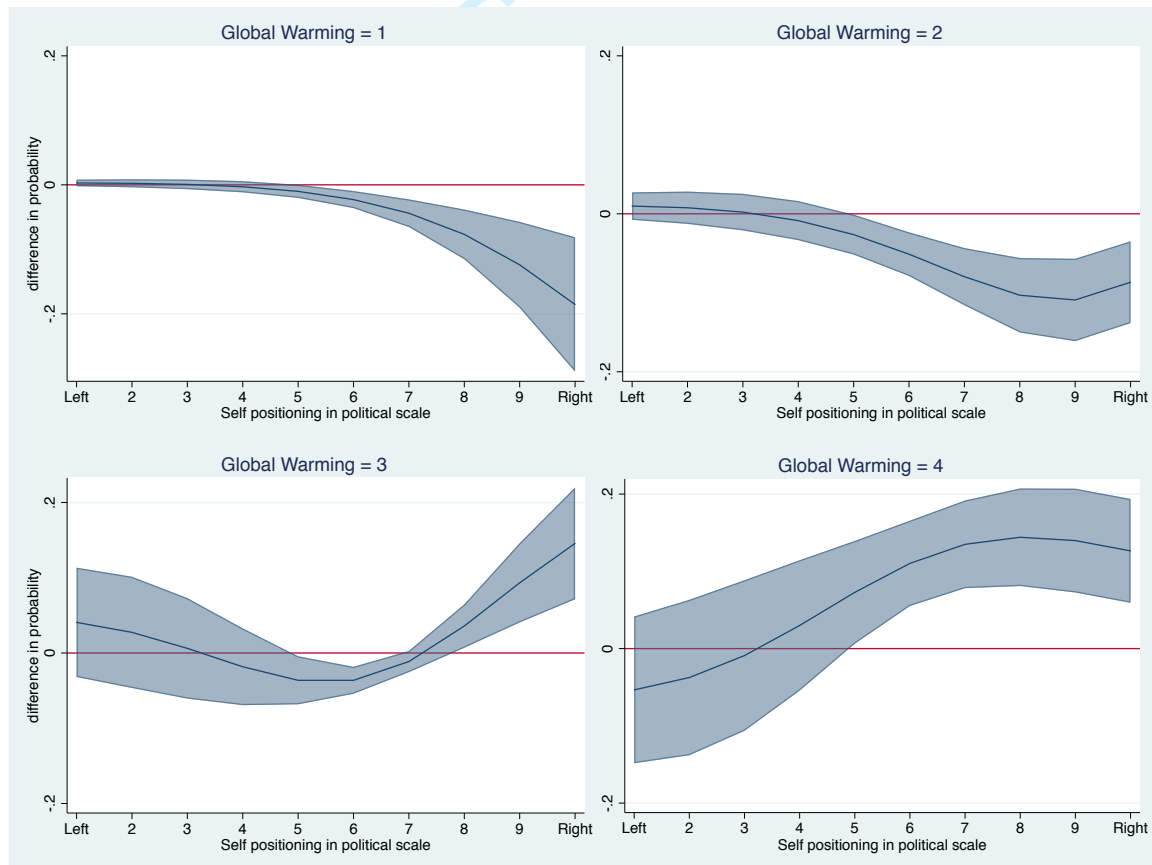
Figures G-J. Ordered logit graphs: perceived seriousness of global warming or the greenhouse effect on political ideology and global citizen identity (dichotomously coded)

The blue sections show the patterns of predicted probabilities for global citizens across the four vales of perceived seriousness, with self-reported political ideology on the x-axis.

As the graphs again show, the four vales of perceived seriousness show different patterns of predicted probabilities. The pattern trends down toward the right for Global Warming=1 ("not serious at all") and Global Warming=2 ("not very serious"), with global citizens having the lower probabilities. While for Global Warming=3, the lines of the predicted probabilities cross over one another. For Global Warming = 4 the trend is up toward the right with global citizens having the higher probabilities.

Overall, liberals stay largely consistent in their perceived seriousness regardless of whether they have a global citizen identity or not, while conservatives who are global citizens show the most change across the 4 conditions.

Appendix References

Douglas, Mary, and Aaron Wildavsky. 1983. *Risk and culture: An essay on the selection of technological and environmental dangers*. University of California Press.