

The impacts of political cues and practical information on climate change decisions

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The impacts of political cues and practical information on climate change decisions

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Adapting to climate change will require people to make measured decisions, informed by the science relevant to those choices. Communicating that science is complicated by the politicization of the topic. In two studies, we ask how political cues, designed to evoke individuals' sense of identity as believers or nonbelievers in global warming, affect a hypothetical decision: buying a home vulnerable to coastal flooding exacerbated by global warming using the Zillow[®] real estate website. In both studies, we manipulate participants' frame of reference by focusing them on risks due to 'elevation', 'global warming', or both, or mentioning neither. We also examine how immersion in practical details affects the power of these cues by manipulating whether participants have access to Risk Finder (<http://sealevel.climatecentral.org>), an interactive decision aid. Study 1 asks about global warming beliefs after their decision; Study 2 asks beforehand. Both find that immersion in practical information, using Risk Finder, overrode political identity cues. When framed in terms of both elevation and global warming and without explicit expression of global warming beliefs (Study 1), participants' responses reflected their beliefs. The results suggest that communications should acknowledge political differences and then focus on practical decisions and the science that can inform them.

1. Introduction

Evidence of a changing climate is all around us. It is seen in systemic changes, such as sea-level rise, melting icecaps, and higher global mean temperatures [1], as well as in episodic events [2, 3]. In the first few months of 2014 alone, the United States experienced unusual cold in the Midwest, heavy snowfall on the East Coast, and severe drought on the West Coast [4]. Such extreme events are predicted to become more frequent [5–8], with implications for decisions made by businesses (e.g., which crops to grow), governments (e.g., what infrastructure to build), and individuals (e.g., where to live). As with any topic, translating scientific knowledge into useful terms requires identifying the information most critical to decision makers and then communicating it in comprehensible terms [9, 10].

Communication about climate change faces the additional challenge of overcoming the topic's political polarization [11], with personal values,

ideological orientations, and social identity seemingly acting as 'perceptual screens', leading people to interpret messages in ways that reinforce their existing views and allegiances [12–15], particularly for those with strong beliefs about global warming [16, 17], or triggering heuristics leading to biased inferences. Many psychological processes could contribute to such biased information processing. Some, such as confirmation bias, occur with the mere existence of beliefs and influence reasoning without awareness [18]. Others arise from motivated reasoning, invoked more or less consciously to defend desired beliefs and produce behavior consistent with personal values [19–22]. For example, Costa and Kahn (2013) found that providing households with feedback about their own and their neighbor's electricity use was much more effective in reducing energy consumption among liberals (registered as Democrats, Greens, or Peace and Freedom) than among conservatives (registered as Republicans) [23]. Indeed, for unknown reasons,

conservatives who did not get their electricity from renewable resources and did not donate to environmental groups *increased* their energy consumption by 1%, a result interpreted by the authors as their consuming more to act in accordance with their political identity [24]. Other results find that the choice of term, ‘global warming’ or ‘climate change’, can evoke different responses [25].

In two studies, we examine how two manipulations, designed to heighten the salience of political identity related to global warming, affect responses to a realistic (although still hypothetical) decision: buying a home in an area subject to storm surges, potentially affected by sea-level rise. Both manipulations were designed to evoke the sense of identity that can affect information processing [26, 27].

Our task asks participants to use Zillow[®], a US real estate listing service, to choose a prospective home in Savannah, GA, and then describe it in terms of its location and price, and their reasons for selecting it. They then evaluate the home in terms of several risk-related concerns, including ones relevant to climate change.

One manipulation of political identity varies how the task is framed, by presenting either (i) no additional information suggesting how to approach it (*no cue*); (ii) information about elevations above sea level in the region (*elevation*), depicted on the Zillow[®] map; (iii) a paragraph on *global warming*; or (iv) both kinds of information (*elevation + global warming*). ‘No cue’ should evoke neither practical concerns nor political identity, beyond what would occur to participants naturally. The ‘elevation’ information should evoke practical concern for all respondents. The ‘global warming’ information should evoke political identity for both believers and nonbelievers in global warming; it should have practical value for believers, but not for nonbelievers. The combined information (‘elevation + global warming’) should evoke both practical concerns and political identity for believers, hence have additive impact, but evoke conflicting responses for nonbelievers.

The second manipulation varies whether participants self-identify as believers or nonbelievers in global warming, prior to completing the task (in Study 2) or afterward (in Study 1). The research literature offers conflicting predictions regarding the effects of prior self-identification. On the one hand, participants may feel pressure to make decisions consistent with that expressed identity. On the other hand, self-affirmation theory [28] holds that allowing people to affirm their identity makes them more receptive to messages that might otherwise threaten it [29–32], thereby diminishing its role in their judgments. We predict that, with these practical decisions, made in private, the latter processes dominate. That is, participants express their identity, and then get on with the tasks, reducing differences between believers and nonbelievers.

In addition to manipulating political identity, we also manipulate how deeply participants can immerse themselves in the practical details of their task, predicting that deeper immersion will reduce identity effects. Specifically, we offer half of the participants the use of Risk Finder, an interactive decision aid (<http://sealevel.climatecentral.org>) showing flood risk and associated impacts for Savannah, GA. We expect these practical details to make coastal flooding risks more real and relevant, reducing participants’ psychological distance from the task. That engagement should lead to deeper processing, which reduces, in turn, the role of political identity [33–37]. If involvement with a practical task can, indeed, overcome the effects of political identity, then the rancor of debates over the existence of global warming might subside when people make such decisions related to its potential impacts (unless, of course, those decisions become arenas for political fights that make the details irrelevant).

Thus, in Study 1, participants self-identify as believers or nonbelievers in global warming after they complete tasks related to purchasing a home facing risks related to global warming. We predict that these participants’ political identity will express itself in the following ways with the four frames: (1) with ‘no cue’ and ‘elevation’, two conditions making no reference to global warming, believers and nonbelievers will respond similarly (with both seeing greater risk with ‘elevation’). (2) With the ‘global warming’ frame, believers will see greater risk than will nonbelievers. (3) The combined frame (‘elevation + global warming’) will elicit risk-related concerns for believers, and conflicting responses for nonbelievers. In Study 2, participants self-identify before completing these tasks. We predict that allowing these participants to express their identity will free them to focus on the practical decisions, reducing differences between believers and nonbelievers. Finally, we predict that (in both studies) using Risk Finder will eliminate differences between believers and nonbelievers, by immersing them in practical details of their task. Throughout, we seek to make the task as realistic as possible, while still recognizing its hypothetical nature.

2. Study 1—global warming question after tasks

2.1. Methods

2.1.1. Experimental procedures

After a brief introduction, informed consent, and screening for age (≥ 18) and for not currently living in Georgia, all participants were asked to imagine moving with their family to Savannah, GA. To enhance personal relevance [34], participants were told to imagine that their family wants to buy a ‘single-family home’ with ‘no plans to move ever again’. They then saw a Zillow[®] map (figure 1) with current real estate listings in Savannah, and chose a home that would be

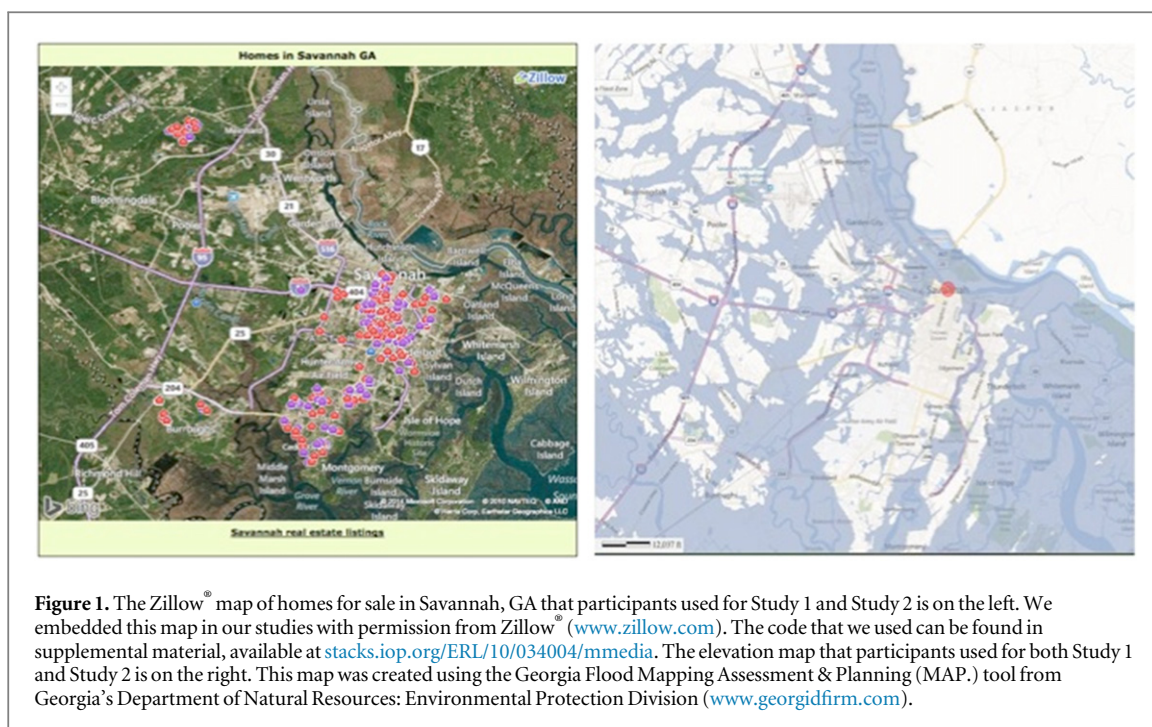


Figure 1. The Zillow[®] map of homes for sale in Savannah, GA that participants used for Study 1 and Study 2 is on the left. We embedded this map in our studies with permission from Zillow[®] (www.zillow.com). The code that we used can be found in supplemental material, available at stacks.iop.org/ERL/10/034004/mmedia. The elevation map that participants used for both Study 1 and Study 2 is on the right. This map was created using the Georgia Flood Mapping Assessment & Planning (MAP.) tool from Georgia's Department of Natural Resources: Environmental Protection Division (www.georgidfirm.com).

best for their family. After selecting it, they reported its address, list price, and answered the open-ended questions, 'In a few sentences, tell us what you'd like to know about Savannah that would help you decide if you want to buy this home' and 'What other expenses would you consider in buying this home?'³ Next, participants were asked, 'If you were, in fact, moving to Savannah and you had the money, would you buy this home?' (1 = Yes, 2 = No).

Participants were then randomly assigned to one of eight conditions, with Framing and Aid as crossed factors. The four levels of Framing were:

(i) no cue: participants went directly to the response measures (described below).

(ii) Elevation: participants were shown an elevation map of Savannah, where they read, 'Look where your home is on the Zillow[®] map. Now, find your home on the elevation map below. Places on the map in blue mean that the land is at low elevation. Take a minute to study the two maps'. (figure 1).

(iii) Global Warming: participants read, 'The best scientific knowledge suggests that sea level is rising in Savannah. Sea level has been rising for as long as scientists have been able to measure it accurately. The more that sea level rises, the more coastal

floods increase. Global warming contributes to sea level rise by melting glaciers and ice sheets into the oceans. It also heats ocean water, causing it to expand'.

(iv) Elevation + Global Warming: participants received both frames.

Note that, in addition to providing the political cue of global warming, frames (iii) and (iv) also had practical value, providing information relevant for decision making, and engaged participants further with the task.

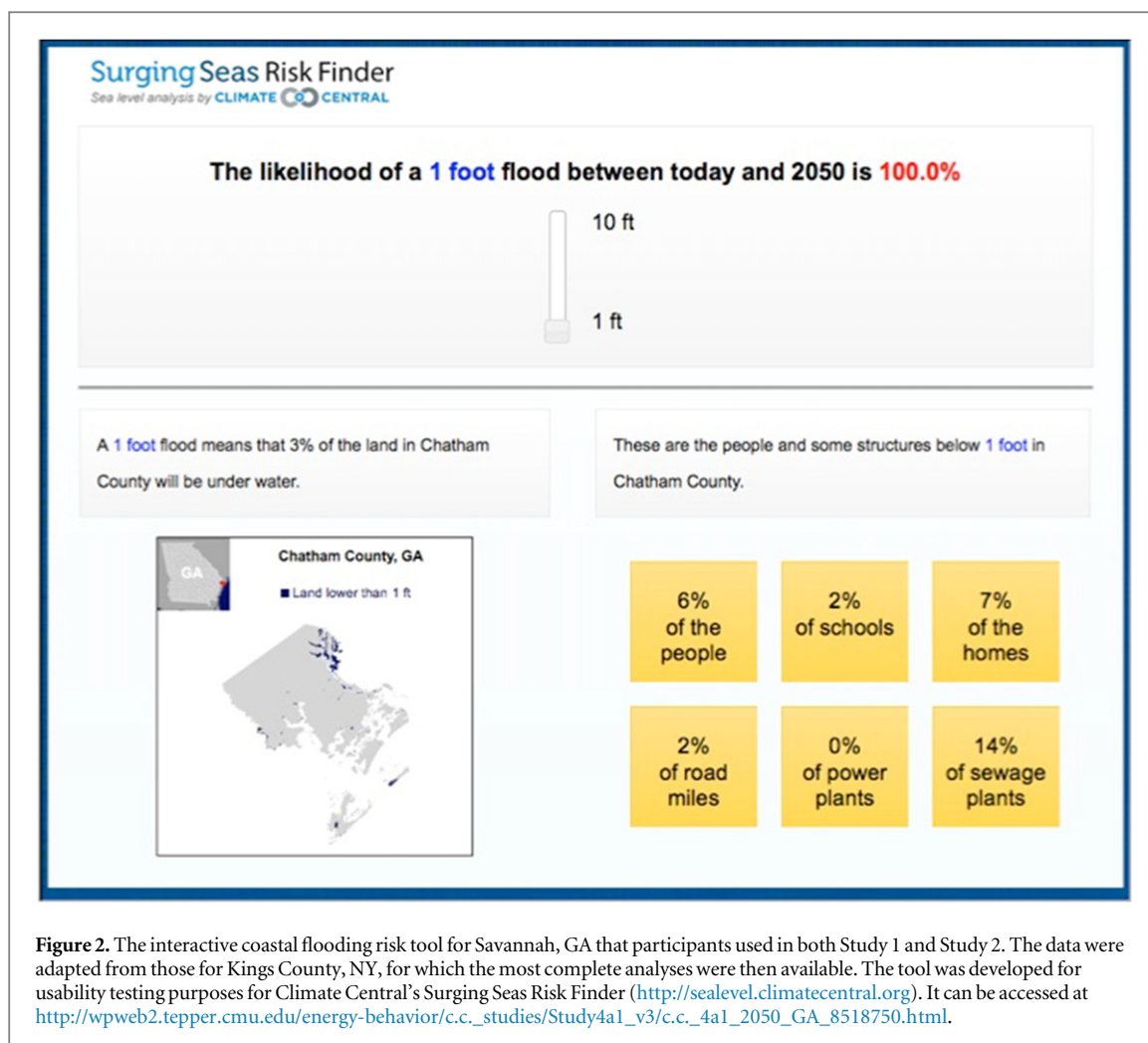
The two levels of Aid were:

(v) without Risk Finder: participants searched the Zillow[®] map on their own.

(vi) With Risk Finder: participants used a mock-up of the surging seas 'Risk Finder' tool (figure 2) (<http://sealevel.climatecentral.org>) to manipulate flood height between 0 and 10 + feet, allowing them to see predictions of the corresponding (a) chances of such a flood 'between today and 2050', (b) map of land under water, (c) percentage of land under water, and (d) percentage of people, schools, homes, road miles, power plants, and sewage plants affected in Savannah, GA. They were then instructed to 'take a few minutes to learn about flooding risk for the area'.

Finally, participants completed the response measures and answered demographic questions. Figure 3 summarizes the study design.

³ A search revealed the following percentages of Study 1 participants spontaneously mentioning each of these terms: 'climate change' or 'global warming' (0%), 'flood' or 'flooding' (1.8%), 'flood insurance' (1.1%), 'sea-level rise' (0.1%). A search revealed the following percentages of Study 2 participants spontaneously mentioning each of these terms: 'climate change' or 'global warming' (0.2%), 'flood' or 'flooding' (2.2%), 'flood insurance' (1%), 'sea-level rise' (0%).



2.1.2. Measures

2.1.2.1. Dependent variables

Participants answered the open-ended question, 'Assume that you were going to buy the home that you chose earlier. If you had to guess, what do you think that annual flood insurance is for the home?' They then rated their agreement (1 = very unlikely, 7 = very likely) with the following statements: 'How likely is it that you would still buy the home if you had to pay that much for flood insurance?' (*buying with insurance*); 'How likely is it that you would still buy the home if flood insurance were not available?' (*buying without insurance*); and 'How likely is it that you would still move to Savannah if flood insurance were not available?' (*moving without insurance*). We combined the three statements into an index (Cronbach's $\alpha = 0.79$), which was reverse coded to create the dependent variable (a) *overall perceived risk*. We computed the difference between *buying with insurance* and *buying without insurance* in order to create a second dependent variable, (b) *sensitivity to insurance availability*, with a positive score indicating greater willingness to buy the home when insurance was

available. As a manipulation check for how well participants understood the task, we examined whether they reported being more likely to buy a home when insurance was available, compared to when it was not.

2.1.2.2. Belief about global warming

We used one question from Maibach, Roser-Renouf & Leiserowitz's (2009) Six Americas survey to assess beliefs about global warming [38]. Participants read, 'Recently you may have noticed that global warming has been getting some attention in the news. Global warming refers to the idea that the world's average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world's climate may change as a result'. They were then asked, 'What do you think? Do you think that global warming is happening?' (1 = Yes, 2 = No, 3 = I don't know) and then, if they answered 'Yes' or 'No', to indicate their level of certainty on a scale anchored at 1 = ...and I'm extremely sure, 4 = ...but I'm not at all sure. These questions appeared at the end of the study. Participants who answered 'I don't know' were excluded from the study.

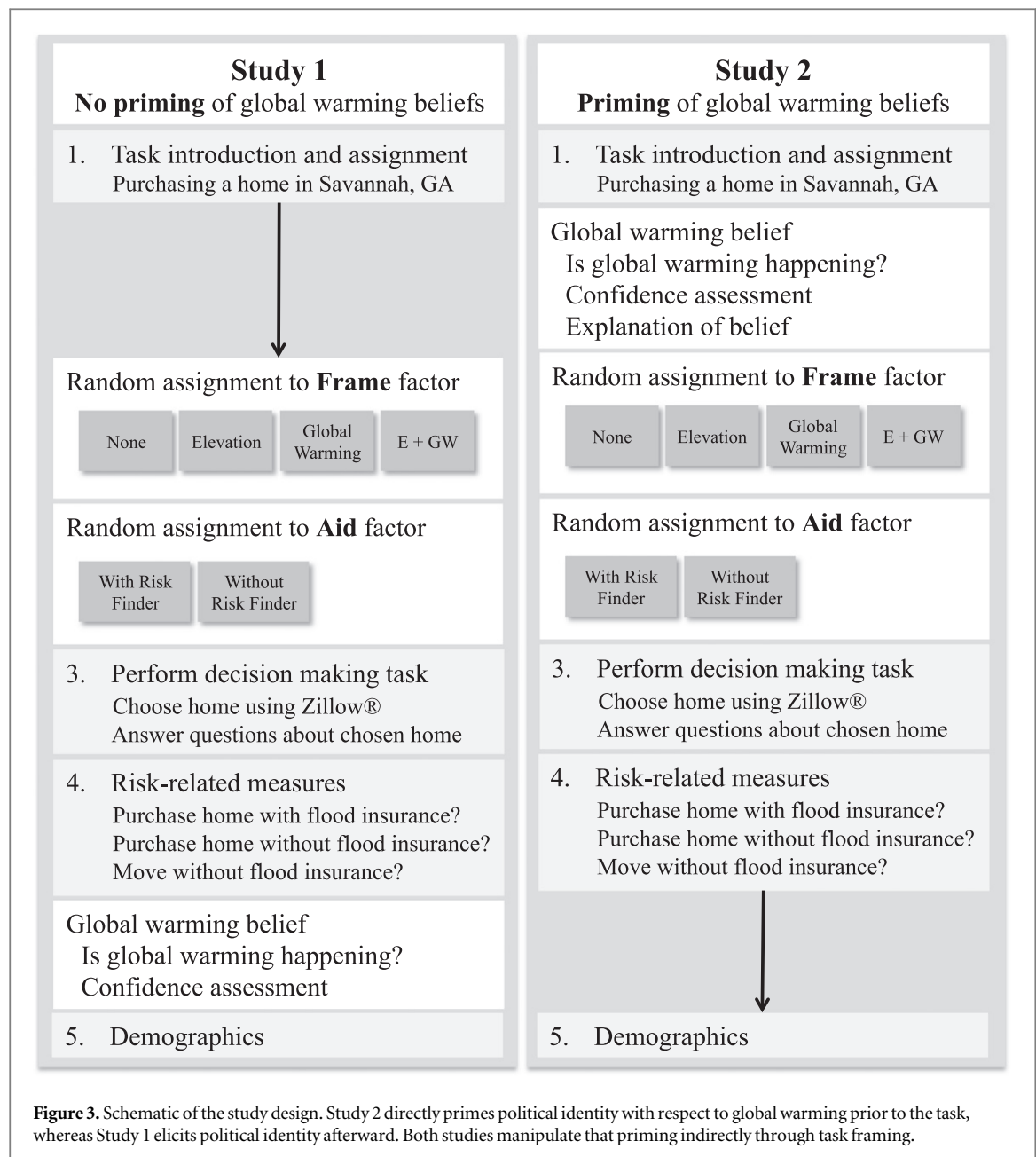


Figure 3. Schematic of the study design. Study 2 directly primes political identity with respect to global warming prior to the task, whereas Study 1 elicits political identity afterward. Both studies manipulate that priming indirectly through task framing.

2.1.3. Participants

We recruited 1383 participants through an advertisement at Amazon's Mechanical Turk (MTurk), an online recruiting service [39]. Comparisons of behavioral experiments using MTurk and other recruitment methods have found few differences [40]. A power analysis using G*Power [41] indicated a total sample of 357 for a small effect size ($\eta^2 = 0.03$) with 80% power, for ANOVA (fixed effects, main effects, and interactions) with alpha at 0.05. We decided to recruit approximately four times that number of participants in order to obtain enough nonbelievers, based on their (minority) prevalence in national polls [42].

Participants' self-reported mean age was 30.8 (SD = 10.5), with 45.8% female, 76.5% White or Caucasian, 49.0% having at least a bachelor's degree and 43.8% having household income of at least \$51K. In

terms of party affiliation, 46.4% reported being Democrats, 34.1% Independents, 12.8% Republicans and 6.7% Other or Prefer not to answer. Nearly one-third reported having lived near the coast (31.1%), 86.6% of whom reported being familiar with it. Most had vacationed along the coast (81.4%). More than one-third had experienced a hurricane (38.4%), and most (58.4%) had experienced a flood or knew someone who had. Those who answered 'yes' to the question, 'Do you think that global warming is happening?', were treated as 'believers' ($n = 1212$); those who answered 'no' were treated as 'nonbelievers' ($n = 171$). Nonbelievers were significantly more confident in their positions than were the believers, ($M = 2.16$ versus 1.97) $p < 0.001$, on the 1–4 confidence scale. Believers (85.4%) were significantly more likely to be Democrats than were nonbelievers (23.4%), $\chi^2(1, N = 818) = 189.18, p < 0.001$.

Table 1. ANOVAs with factors of Belief (believer versus non-believer), Framing (no cue, elevation, global warming, or elevation + global warming), and Aid (without Risk Finder versus with Risk Finder).

Source	Dependent variables	
	(a) Overall risk	(b) Insurance availability
No priming (Study 1)		
Main effects		
Belief (B)	$F = 1.68, \eta^2 = 0.02$	$F = 0.21, \eta^2 = 0.00$
Frame (F)	$F = 2.09, \eta^2 = 0.01$	$F = 0.75, \eta^2 = 0.00$
Aid (A)	$F = 7.88, \eta^2 = 0.01^*$	$F = 0.05, \eta^2 = 0.00$
Interaction effects		
<i>BXF</i>	$F = 2.71, \eta^2 = 0.01^*$	$F = 1.69, \eta^2 = 0.00$
<i>BXA</i>	$F = 1.62, \eta^2 = 0.00$	$F = 2.32, \eta^2 = 0.00$
<i>FXA</i>	$F = 3.55, \eta^2 = 0.01^*$	$F = 2.99, \eta^2 = 0.01^*$
<i>BXFXA</i>	$F = 1.48, \eta^2 = 0.00$	$F = 0.11, \eta^2 = 0.00$
Priming (Study 2)		
Main effects		
Belief (B)	$F = 3.51, \eta^2 = 0.01$	$F = 0.05, \eta^2 = 0.00$
Frame (F)	$F = 1.45, \eta^2 = 0.02$	$F = 0.91, \eta^2 = 0.01$
Aid (A)	$F = 15.01, \eta^2 = 0.05^*$	$F = 5.06, \eta^2 = 0.02^*$
Interaction effects		
<i>BXF</i>	$F = 0.16, \eta^2 = 0.00$	$F = 1.04, \eta^2 = 0.01$
<i>BXA</i>	$F = 0.46, \eta^2 = 0.00$	$F = 0.22, \eta^2 = 0.00$
<i>FXA</i>	$F = 2.69, \eta^2 = 0.03^*$	$F = 2.17, \eta^2 = 0.01$
<i>BXFXA</i>	$F = 0.74, \eta^2 = 0.01$	$F = 1.24, \eta^2 = 0.01$

Note. The ANOVAs for the dependent variables controlled for the list price of the home (as found on Zillow[®]), participants' estimates for the cost of flood insurance, and whether participants said that they would buy the chosen home. *F*-values with * are significant at $p < 0.05$.

2.2. Results

2.2.1. Analysis plan

For each dependent variable, we conducted separate Analyses of Variance (ANOVA) examining the effects of Framing (no cue, elevation, global warming, elevation + global warming), Aid (with or without Risk Finder) and Belief (believer or nonbeliever). The dependent variables were (a) overall perceived risk and (b) sensitivity to insurance availability. Participants' willingness to buy the home that they had selected (if they were moving to Savannah and had the money) and estimates of flood insurance cost (as a proxy for perceived elevation) did not differ by experimental condition ($H(7) = 8.19, p = 0.32$; $F(71, 320) = .77, p = 0.62$, respectively), consistent with successful randomization.

2.2.2. Manipulation check

A paired-sample *t*-test found that participants were much more willing to buy a home when insurance was available ($M = 4.33, SD = 1.70$) than when it was not ($M = 2.99, SD = 1.79$), $t(1383) = 26.30, p < 0.001$, 95% CI of the difference [1.24, 1.44], indicating an understanding of the task.

2.2.3. Analyses

As shown in table 1, neither Belief nor Framing had a main effect for either dependent variable. However, Aid did for perceived overall risk: participants who used Risk Finder saw greater risk, as expressed in being less willing to move to Savannah.

There was a significant interaction between Aid and Framing for both dependent variables. As seen in figure 4 (left-hand side), with the no cue and elevation frame conditions, participants with Risk Finder saw significantly greater risk than did those without it. However, having Risk Finder made no difference with the global warming or elevation + global warming frames, suggesting that those frames alone were enough to evoke greater concern. We also found a significant interaction between Framing and Belief for overall perceived risk. As seen in figure 5 (left-hand side), believers saw greater risk (and nonbelievers less risk) with the elevation + global warming frame, whereas there was no difference in the other three frames (figure 5). Tables S1 and S2 in supplemental material present additional results.

2.3. Summary

Study 1 manipulated the salience of political identity with four alternative frames for considering a hypothetical decision about purchasing a home subject to coastal flooding risks. For participants who used just the Zillow[®] real estate interface to examine houses, believers and nonbelievers responded similarly for three frames (no cue, elevation, global warming), but much differently for the fourth (elevation + global warming). When asked to consider both factors, believers saw greater risk, whereas nonbelievers saw less. That interaction (between Frame and Belief) disappeared for participants who had access to the Risk Finder decision aid and, with it, the opportunity for greater immersion in practical details of the decision. Having Risk Finder heightened perceived risk and sensitivity to the availability of flood insurance for the no cue and elevation frames, but not the other two, suggesting that mentioning global warming sufficed to evoke a greater sense of risk.

In Study 1, political identity was implicit, and manipulated indirectly through task framing. Study 2 makes it explicit, by having participants identify themselves as believers or nonbelievers before performing the tasks.

3. Study 2—global warming question before tasks

3.1. Methods

3.1.1. Experimental procedures

The procedure was the same as in Study 1, except that participants were asked about global warming beliefs at the beginning, rather than the end. They were also

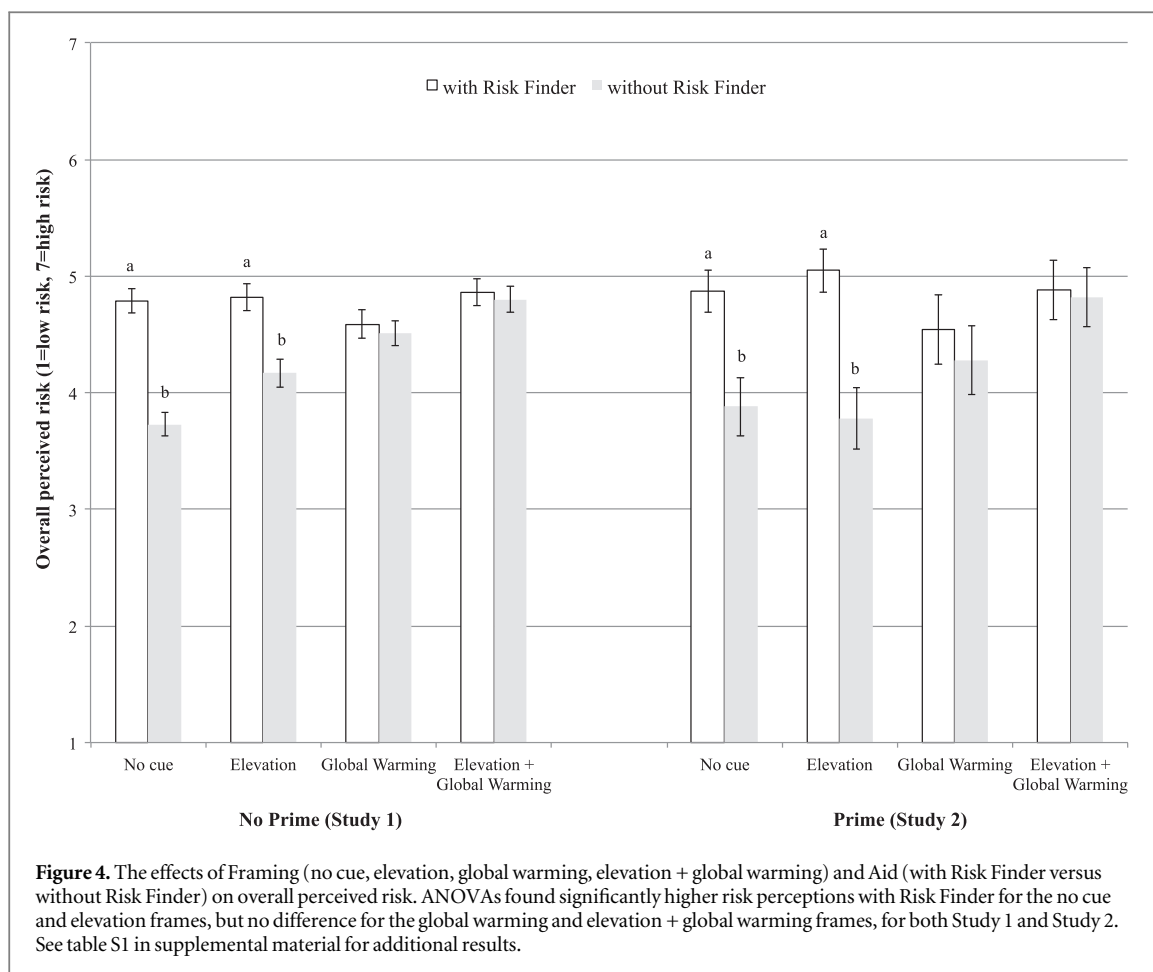


Figure 4. The effects of Framing (no cue, elevation, global warming, elevation + global warming) and Aid (with Risk Finder versus without Risk Finder) on overall perceived risk. ANOVAs found significantly higher risk perceptions with Risk Finder for the no cue and elevation frames, but no difference for the global warming and elevation + global warming frames, for both Study 1 and Study 2. See table S1 in supplemental material for additional results.

asked to explain why they hold the beliefs they do about global warming.

3.1.2. Measures

The same measures were used as in Study 1. Cronbach's α for the dependent variable, *overall perceived risk*, was 0.85.

3.1.3. Participants

We followed the same power analysis as in Study 1, and again used MTurk. In order to secure roughly equal numbers of believers and nonbelievers, we first screened 1342 participants for their attitudes on a variety of policy topics, including global warming. Based on their responses, we recruited 194 global warming 'believers' and 134 'nonbelievers' for Study 2. We treated the screening test as priming that aspect of their identity. As in Study 1, nonbelievers were significantly more confident in their positions than were the believers, ($M = 2.25$ versus 1.55) $p < 0.001$, on the 1–4 confidence scale. Based on self-reports, participants' average age was 31.7 (SD = 10.2), with 36.7% female, 82.5% White or Caucasian, 42.9% with at least a bachelor's degree, and 43.9% with household income of at least \$51K. In terms of party affiliation, 34.9% reported being Democrats, 35.5% Independents, 23.5% Republicans and 6.1% Other or Prefer not to answer. About one-quarter reported having

lived near the coast (25.2%), 83.3% of whom reported being familiar with it. Most had vacationed along the coast (76.9%). More than one-third had experienced a hurricane (39.4%) and most (52.9%) had experienced a flood or knew someone who had. As before, there was a significant association between Belief (believer, nonbeliever) and political affiliation (Democrat, Republican), $\chi^2(1, N = 191) = 89.33, p < 0.001$. Believers (87.0%) were more likely to be Democrats than were nonbelievers (18.4%).

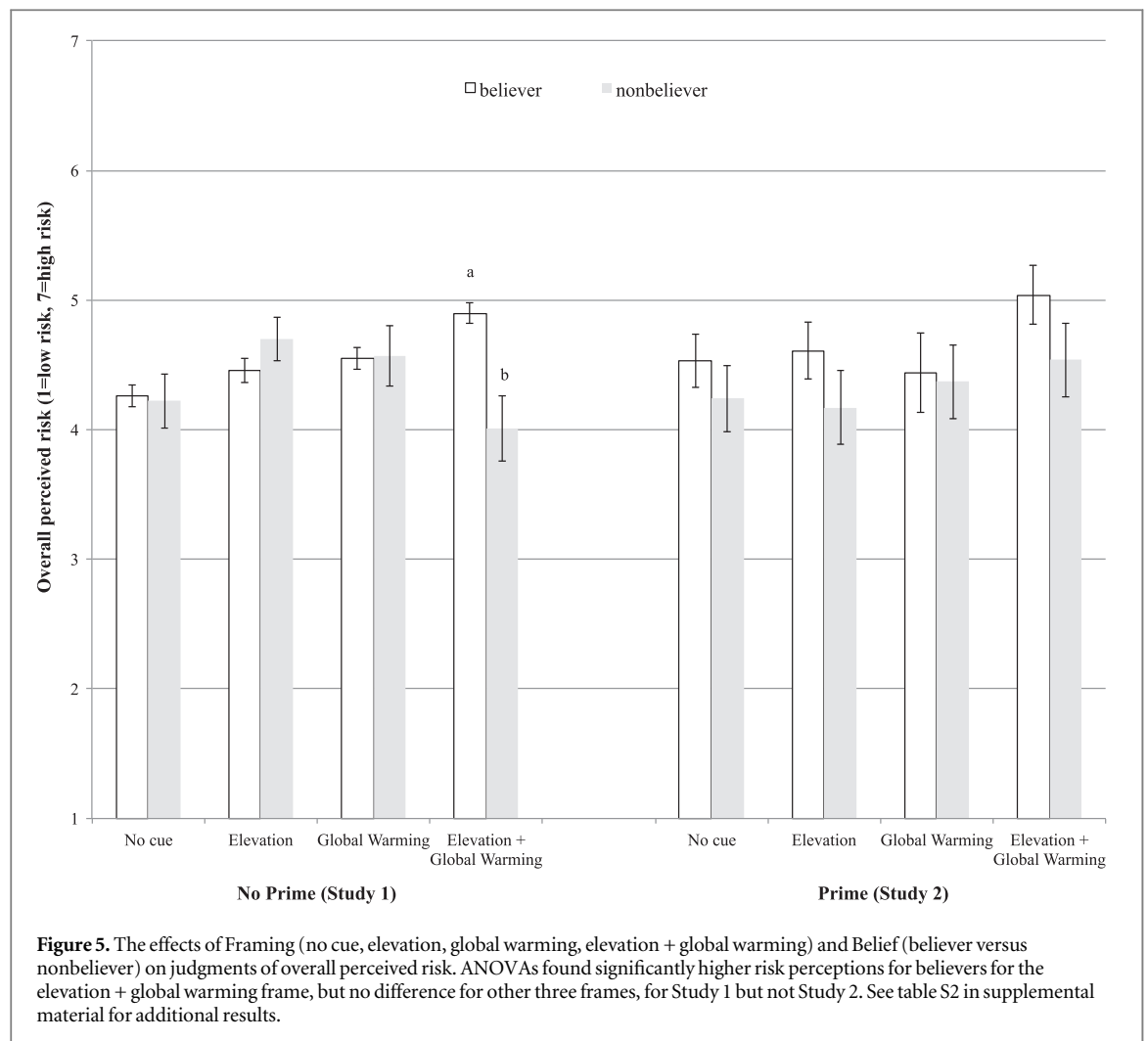
3.2. Results

3.2.1. Analysis plan

The analyses followed those of Study 1. As before, participants' willingness to buy the home they selected and estimates of flood insurance cost did not differ by condition ($H(7) = 6.04, p = 0.54$; $F(7327) = 0.50, p = 0.83$, respectively), consistent with successful randomization.

3.2.2. Manipulation check

A paired-sample t-test found that participants were much more willing to buy a home when insurance was available ($M = 4.17, SD = 1.73$) than when it was not ($M = 2.96, SD = 1.83$), $t(327) = 13.50, p < 0.001$, 95% CI of the difference [1.03, 1.39], indicating an understanding of the task. As in Study 1, there was a significant main effect for Aid, such that sensitivity to



insurance availability was greater with Risk Finder than without, in each frame.

3.2.3. Analyses

As seen in table 1 (right-hand side), there was, again, no main effect for Framing and one for Aid. As in Study 1, participants who used Risk Finder expressed greater reluctance to move to Savannah. There was, again, a significant Framing x Aid interaction for overall risk perception, such that having Risk Finder increased risk judgments for participants receiving no frame or the elevation frame, but not for those receiving either frame mentioning global warming (figure 4). As a measure of the relative impact of the two manipulations, *with* Risk Finder, participants in the no cue condition saw risks as great as did participants *without* Risk Finder in the elevation + global warming frame. Table S1 in supplemental material presents additional results.

As in Study 1, there was no main effect for Belief on overall perceived risk or on sensitivity to the availability of flood insurance. Unlike Study 1, there was no interaction between Belief and Framing, suggesting

that the initial question evoked political identity strongly enough that the frames added nothing. In order to see whether the difference in results reflected the smaller sample in Study 2, we generated three random subsamples of Study 1 participants with Study 2's sample size equivalent and still found Study 1's interaction.

3.3. Summary

Study 2 manipulated political identity *directly* by asking about it before participants began their task. Nonetheless, participants in Study 2 generally responded similarly to those in Study 1. As in Study 1, using Risk Finder heightened perceived risk when the frame made no mention of global warming (no cue, elevation), but not when it did, to the extent that Risk Finder eliminated any effect of the frame. Unlike Study 1, though, believers and nonbelievers responded similarly throughout. Thus, asking participants to express their political identity appeared to allow them to focus on the decision-making task, in ways that revealed similar sensitivity to the varying details related to coastal flooding risks.

4. General discussion

Sound communications provide information relevant to recipients' decisions. For people thinking about moving to an area subject to coastal flooding, that information includes the risk of flooding, captured here by the elevation of the home that they have chosen, and their financial exposure, captured here by the availability of insurance. Global warming influences those risks, as well as the value and cost of insurance.

In both of the present studies, participants responded to such information in orderly ways. They saw greater risk, as expressed in their reduced willingness to move to a flood-prone area, when flood insurance was unavailable, when global warming was mentioned, and when they could learn more about flooding risks using the Risk Finder decision aid. Generally speaking, participants who identified themselves as believers and nonbelievers in global warming responded similarly. The one exception was that, in Study 1, where belief was elicited at the end, nonbelievers reported less risk with the combined frame (elevation + global warming). That difference effectively disappeared in Study 2, where participants expressed their beliefs about global warming before doing the task.

Thus, it appears that even the simplest version of our task (with no cues and without Risk Finder), participants were sufficiently engaged in the details of the decision to make political identity largely irrelevant. Any remaining differences disappeared when participants used Risk Finder, a decision aid designed [43] to make decisions more personal, local, immediate and real, thereby addressing the four dimensions of Construal Level Theory [35, 36]. These results contrast with the polarized discussion regarding general issues (e.g., is global warming happening? are people responsible? should we take political action?)

Drawing on self-affirmation [32] and reactance theory [44], we speculate that the one difference between believers and nonbelievers (with the elevation + global warming frame in Study 1) arose because nonbelievers, without the immersion of Risk Finder, found it heavy handed—as though they were being manipulated into endorsing global warming as a price for acknowledging the importance of elevation. That interaction vanished in Study 1, with the additional detail provided by Risk Finder, and in Study 2, where the legitimacy of participants' identity was acknowledged by having them state their beliefs prior to performing the task. If so, then, rather than accentuating motivated reasoning, the opportunity to affirm their identity may have allowed participants to focus on the task [29–32].

A topic for future study is how nonbelievers reconciled their general beliefs about global warming with these specific decisions, enough to respond like believers. We offer several possible explanations. One is that

the decision allowed nonbelievers to accept a risk of global warming without having to acknowledge its anthropogenic origin. A second is that political debates, focusing on public policies (e.g., carbon tax, cap-and-trade), have only weak implications for personal decisions. A third is that nonbelievers see the probability of global warming as high enough to affect home purchases, even if it is not high enough to affect public policies (which might also be opposed on other grounds). A fourth is that any transient emotions evoked by references to global warming dissipated as participants engaged in the concrete tasks. A fifth is that some nonbelievers may actually believe the science, but not want to admit it publicly, in order to show solidarity with political allies and avoid implicit endorsement of policies that they oppose (e.g., government intervention) [45, 46]. They are free of those constraints with personal decisions, especially when made in the privacy of an experiment. Fuller understanding of these processes awaits additional studies, in which there may be special value for using realistic, engaging practical tasks such as those made possible with Zillow[®] and Risk Finder, both developed by substantive experts with resources beyond those available for most studies of social and political identity [39–44, 47–49]. Looking at self-reports of actual decisions, Maibach *et al* (2009) found similar, greater energy-conservation behavior among Alarmed Americans and Dismissive Americans, with members of both groups paying more attention to these issues than do members of the other four Americas (Concerned, Cautious, Disengaged, Doubtful) [38]. For communicators interested in informed decision making, the recommendation emerging from these results is to focus on facts that people need, while avoiding terms that divide them.

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