Meta-analyses of the determinants and outcomes of belief in climate change

Authors: Matthew J. Hornsey[1]*, Emily A. Harris[1], Paul G. Bain[2], Kelly S. Fielding[1]

Affiliations:
[1] University of Queensland, Brisbane, Australia.
[2] School of Psychology and Counselling and Institute of Health and Biomedical Innovation, Queensland University of Technology, Brisbane, Australia.

Corresponding author: Prof. Matthew Hornsey, School of Psychology, Campbell Rd, St Lucia,

University of Queensland

E: m.hornsey@uq.edu.au T: +61 7 3365 6378 F: +61 7 3365 4466

Meta-analyses of the determinants and outcomes of belief in climate change

Abstract

Recent growth in the number of studies examining belief in climate change is a positive development, but presents an ironic challenge in that it can be difficult for academics, practitioners and policy makers to keep pace. As a response to this challenge, the current paper reports the first meta-analysis of the correlates of belief in climate change. Twenty-seven variables were examined by synthesizing 25 polls and 171 academic studies across 56 nations. Two broad conclusions emerged. First, many intuitively appealing variables (such as education, sex, subjective knowledge, and experience of extreme weather events) were overshadowed in predictive power by values, ideologies, worldviews and political orientation. Second, climate change beliefs have only a small relationship with the extent to which people are willing to act in climate-friendly ways. Implications for converting skeptics to the climate change cause – and for converting believers' intentions into action – are discussed.

Meta-analyses of the determinants and outcomes of belief in climate change

A critical mass of people is skeptical that anthropogenic climate change is real, something that has long been identified as an obstacle to mitigation efforts.[1-4] It is not surprising, then, that there has been a concerted effort to examine the variables that are associated with acceptance of (and skepticism about) anthropogenic climate change. The insights associated with this research endeavor are important for a number of reasons, not least of which is that they lay the groundwork for future interventions.

The expansion of this research frontier is so quick that it can be difficult for academics, practitioners and policy makers to keep pace. Furthermore, relevant research has splintered across a large set of disciplines, including psychology, communication, sociology, political science, agriculture, climate science, and media studies. This is a positive development in that it allows for vibrant cross-pollination of theories, methods and assumptions. But it also creates challenges for consumers of the research, given that (a) it is easy to miss relevant research in areas unrelated to one's own, and (b) definitions and measures can vary substantially across disciplines, making it difficult to identify coherent messages.

In response to these challenges, the current paper reports the first meta-analytic examination of the demographic and psychological correlates of belief in climate change. The strength of the meta-analytic approach is its ability to rise above the churn of individual studies and to extract broad themes. As such, it provides a comprehensive overview of who endorses or opposes the reality of climate change and the main reasons they do so. Such an analysis draws on the energies of hundreds of individual climate researchers, but in a way that distils simple and digestible insights for academics, practitioners and policy makers.

Below we report the results of meta-analyses summarizing the relationship between climate change belief and 7 demographic variables (Fig. 1), 13 psychological variables that

according to theory should be antecedents of climate change belief (Fig. 2), and 7 variables widely considered to be downstream consequences of climate change belief (Fig. 3). We acknowledge that most of the studies are correlational in nature, so although the distinction between antecedents and consequences are based on theoretical considerations, some relationships may be bidirectional. Statistics for the 27 meta-analyses are summarized in Table 1.

Results

Demographics and beliefs

The largest demographic correlate of climate change belief is *political affiliation*. People who intend to vote for more liberal political parties are more likely to believe in climate change than those who align themselves with relatively conservative political parties. The tendency for (conservative) Republicans to express more skepticism than (liberal) Democrats has long been identified within the U.S., and has been credited with contributing to a growing ideological gulf between skeptics and non-skeptics.[5-8] The current data further implicate political alignments in acceptance of climate change; its effect is roughly double the size of any other demographic variable.

The link between climate change beliefs and *political ideology* (i.e., the extent to which people report being liberal or conservative, reported along a continuous scale and measured independently of voting intention) is also significant but less strong. This suggests that acceptance of climate change is more aligned to specific identification with political parties than to underlying political ideologies.

Relatively small effects were found for the other demographic variables: age, education, income, race, and sex. People with stronger beliefs in climate change were younger, more educated, higher income, and more likely to be white and female, but these effects were muted. Although a “conservative white male” profile has emerged of climate

change skeptics in the U.S.[9], our analysis of polls across multiple nations suggest that the "conservative" part of that equation would seem to be more diagnostic than the "white male" part.

Antecedents of beliefs

Knowledge: Early studies showed skeptics to have levels of scientific knowledge that were roughly equivalent to those of non-skeptics.[10,11] These studies, however, measured participants' subjective perception of their own expertise (*subjective knowledge*) leading some to argue that it would be more diagnostic to measure people's awareness of objectively verifiable facts (*objective knowledge*).[12] Our analysis suggests that belief in climate change is stronger the greater people's subjective and objective knowledge, but consistent with theorists' intuitions the association is stronger for objective knowledge than for subjective knowledge (see Fig. 2). It should be noted, though, that these main effects may be qualified by a moderated effect: research in the U.S. using representative samples suggest that the link between (subjective) knowledge and belief is strongly positive among Democrats and Independents, but negligible among Republicans.[11,13] Such observations reinforce arguments that knowledge-related variables may be shaped by, or trumped by, ideological factors.[14-17]

Beliefs about science: In the face of very high complexity, people are prone to make judgments using cognitive heuristics, or "rules of thumb", rather than systematically reviewing evidence. Two interrelated heuristics have been implicated in climate change belief: a source heuristic ("*scientists are trustworthy* so the scientific orthodoxy must be true")[11] and a consensus heuristic ("there is *scientific consensus* around climate change, and consensus implies correctness").[18-20] As can be seen in Fig. 2, belief in climate change was stronger the more people endorsed these heuristics, representing the second- and third-largest psychological predictors of climate change belief.

Concern for the environment: It makes intuitive sense that people concerned about the environment's vulnerability will be more attentive to the dangers of climate change, and may use a precautionary principle in weighing up the levels of evidence ("if there is a chance that climate change is real then it is enough of a reason to act"). One of the most widely used constructs in the environmental psychology literature is the New Ecological Paradigm (NEP)[21], a scale that is weighted heavily with items about the fragility of the environment and the importance of minimizing humanity's impact on it. Although the scale does not mention climate change, belief in climate change tends to be stronger the higher people endorse the NEP. Indeed, this relationship was the strongest of all the variables.

We also identified 16 studies that measured whether people have a "green" or activist identity with regard to the environment. Although such an identity may reflect many things, it can be interpreted as a reflection of what happens when concern for the environment becomes embedded as an important social category in one's self-concept. Unsurprisingly, the stronger people's green identity the stronger their acceptance of climate change. The fact that the positive relationship was relatively weak may partly reflect the fact that some people perceive stigma around activist identities, and so would rather construe their concern in terms of their personal values rather than as a social identity.

Values and ideologies: There is a vast body of research examining how social attitudes are influenced by underlying ideologies, worldviews, and values, and increasingly this approach has been applied to understanding climate change beliefs. Drawing on Schwartz's[22] theory of universal values, Stern and colleagues[23] identified a set of specifically *biospheric values* that relate to protecting the environment. Fig. 2 confirms that placing a high importance on the natural environment is associated with believing climate change is real, showing a small to moderate effect size.

Another influential theory is Cultural Cognition (adapted from Douglas's Cultural Theory)[24], which argues that people's perceptions of risk are influenced by their concept of how society should be structured and that this conceptualization leads them to uphold specific cultural values.[16,25] For example, people who subscribe to relatively individualistic and hierarchical values are more inclined to value elites and the status quo and so are motivated to disbelieve that industry poses a risk to the environment. In contrast, people who subscribe to relatively egalitarian and communitarian values are more likely to have a moral suspicion of industry, and so are motivated to embrace the risk that industry presents to the environment. These propositions are supported by the data: belief in climate change is lower the more people adopt hierarchical and individualistic cultural values.

Another ideology that has been implicated in climate change beliefs is free-market ideology, which maintains that the forces of supply and demand should be freed from interventions by regulating authorities. Some scholars have argued that free-market ideologies underpin a range of conspiratorial and skeptical beliefs about science, including climate change skepticism.[26,27] Our analysis of studies that measure both free-market ideology and climate change beliefs lends support for this notion.

Situational cues: A growing research tradition has examined whether people's climate change beliefs are sensitive to direct experiences of weather and other proximal environmental cues. Since researchers first pointed to the fact that British people affected by floods were more likely to believe in climate change[28], there is now a critical mass of studies to gauge whether there is a more general link between climate change belief and *experience of extreme weather events*. Although significant, the relationship is negligible in size.

Other studies have focused on whether people who experience *changes in the local weather over time* are more likely to believe in climate change. Some of these studies use objective weather data (e.g., fluctuations in temperatures over the previous year) whereas

others measure perceptions of such changes. When gathering these data we were careful to exclude items that used the term "climate change" or "change in the climate" as part of the measure, to avoid circularity between this predictor and our criterion variable. However, some conceptual overlap is somewhat unavoidable in operationalizing this construct, and it cannot be ruled out that this would have inflated the relatively large positive correlation with climate change belief.

Finally, a set of experimental studies have drawn on the social psychological literature on subliminal priming to examine whether priming people with *environmental cues of climate change* (e.g., turning up the heat in the laboratory; placing dead trees around participants) has an effect on their belief in climate change. The observed link between these inductions and climate change belief are significant, perhaps surprisingly so given that their impact is unconscious.

Consequences of beliefs

A presumed outcome of believing that (anthropogenic) climate change is real is that people will be motivated to engage in pro-environmental behaviors that help mitigate climate change. Our coding distinguished between subjective ratings of future *intentions* and ratings of actual *behaviors*. As can be seen in Fig. 3, the more people believe in climate change the stronger their pro-environmental intentions and behaviors, but the relationship was stronger for intentions than for behaviors. This is not surprising given that intentions are less compromised by practical reality constraints than are behaviors, and so the relationship between beliefs and intentions is more "pure".

In our coding we also distinguished between *public-sphere* and *private-sphere* pro-environmental behaviors and intentions, using a taxonomy by Stern.[29] Examples of public-sphere acts include petitioning on environmental issues and contributing to environmental organizations. Examples of private-sphere acts include individual energy reduction strategies

and recycling. Interestingly, the gulf between intentions and behaviors observed earlier was more pronounced in the private-sphere than the public-sphere behaviors. This may reflect the fact that some of the public-sphere behaviors may not be as influenced by reality constraints as private-sphere behaviors (e.g., whether one takes public transport may depend on transport availability).

In our review we noted a critical mass of studies that focused on support for public policies that help mitigate against climate change. Within this broad category we identified three categories of studies which varied in how concretely the policy measures were described. At the most abstract level were studies asking people to reflect on the tradeoff between the environment and the economy. Perhaps unsurprisingly, higher *willingness to prioritize the environment over the economy* was associated with higher acceptance of climate change. Other studies focused on support for specific public policies such as promoting alternative energies or creating green policies within organizations ("policy support" in Fig. 3). Here, the link with climate change beliefs was also significant and positive, but less so than when studies asked about the principle of prioritizing the environment over the economy. We also identified 31 studies that measured acceptance of climate change and support for mitigation policies that place a price on carbon (*carbon tax* or *cap and trade*); enough so that we analyzed these studies as a discrete category. The positive link is intuitive but only small to moderate in size. It is noteworthy that the link between these various indices of policy support and climate change beliefs get smaller the more specific and concrete the measure of policy support, and the more the measure implies personal cost on behalf of the respondent.

Moderation Analyses

Table 1 reveals reasonably high levels of variation in the strength of effects of individual studies within our meta-analyses that cannot be explained by random error. To

help identify why this variability exists, we conducted moderation analyses designed to test whether the strength of effects systematically differed across various conditions. Specifically, we performed separate meta-regressions examining three types of moderators: the type of climate change measure used; whether the sample was from the USA; and the extent of climate change contributions in the country where the sample was drawn.

Type of measure. Effect sizes for six constructs were significantly moderated by whether climate change was measured with reference to causes (i.e., anthropogenic climate change; k=40 studies) or more generally (k=131). The pattern was mixed: The effects of environmental cues (β=.50, df=14, p=.022) and subjective knowledge (β=.84, df=32, p<.001) were stronger when climate change was measured without reference to being anthropogenic. In contrast, the effects of public pro-environmental behavior (β=-.44, df=22, p=.026), public pro-environmental intentions (β=-.47, df=43, p=.002), private pro-environmental intentions (β=-.49, df=64, p<.001), and support for a carbon tax (β=-.38, df=30, p=.003) were stronger when anthropogenic climate change was measured. This last cluster of effects makes sense: Individual action to mitigate climate change is more likely when one believes that climate change is not only happening, but is caused by human activity. Measures of anthropogenic climate change are more likely to pick up on this nuance.

Nationality of sample. Moderation analysis compared U.S. studies (48% of the sample) with non-U.S. studies. Three relationships were stronger in the U.S. samples: public pro-environmental intentions (β=-.41, df=43, p=.008), support for a carbon tax (β=-.62, df=30, p<.001), and willingness to prioritize the environment over the economy (β=-.53, df=19, p=.003). Two relationships were stronger in the non-US samples: subjective knowledge (β=.43, df=32, p=.001), and free-market ideology (β=.47, df=29, p=.011)

Climate change contributions. It is plausible that climate change beliefs could be linked to the extent to which a country was a significant contributor to climate change. We

ran moderation analyses examining whether the strength of effects across studies was correlated with the climate change subscale of the Environmental Performance Index.[31] Only one significant effect emerged: The stronger the environmental performance of the sample nation in terms of emissions and renewables, the stronger was the relationship between climate change belief and objective knowledge (β=.43, df=16, p=.007), suggesting that national-level performance might trickle down to individual level knowledge and understanding (or vice versa).

Implications

One message from the data is that traditional societal faultlines of gender, age, sex, race, and income seem to be of little relevance in determining levels of climate change skepticism. This is not to say there aren't important lessons that can be extracted from examining these demographics, and these variables can interact with psychological variables in meaningful ways. But these demographics shared only trivial relationships with climate change belief, as did education, (subjective) knowledge, and experience with extreme weather events.

Indeed, these intuitively appealing determinants of climate change belief were overshadowed in predictive power by values, ideologies and political orientation. Consistent with the reasoning of many theorists in this area, the data suggest that "evidence" around climate change is searched, remembered, and assimilated in a way that dovetails with people's own political loyalties and their worldviews. For some, this may lead to a disregard for (or misunderstanding of) the scientific consensus around climate change. In the face of this, one can argue that there are limits to the extent to which skeptics can be "converted" through facts and explication alone, and it is equally implausible that climate scientists can change people's underlying values and political allegiances. Instead, some have argued that pro-environmental behaviors can be coaxed out of people by working *with* their ideologies

rather than against them; for example by framing pro-environmental action as a form of patriotism[32] or as an investment in "green" technologies.[33,34]

In terms of the consequences, a salient message from the data is that climate change beliefs have only a modest impact on the extent to which people are willing to act in climate-friendly ways. When phrased in abstract ways (e.g., the willingness to prioritize the environment over the economy) the link with climate change beliefs is relatively strong. But when more specific policies are probed the relationship shrinks, and when policy support is specifically measured with respect to putting a price on carbon it shrinks again. A similar shrinkage occurs when one compares intentions and behaviors: belief in climate change has a solid relationship with the extent to which people *aspire* to behave in climate-friendly ways, but a small-to-moderate relationship with the extent to which people "walk the talk".

Overall, these findings show the benefit of moving beyond the question of "who" disbelieves that climate change is real (e.g., conservatives) to the psychological factors that help explain "why" people hold their views about climate change. The findings offer some hope because psychological factors are more susceptible to targeted interventions than are demographic constructs. Certainly, the challenge remains great, as climate change beliefs are influenced by distal psychological and political beliefs that shape people's assimilation of "the facts". Yet by showing which constructs are most systematically and strongly associated with climate change beliefs across studies, we hope to provide the research community with the best information about how to mobilize and target their efforts.

Correspondence and requests for materials should be addressed to the first author.

Acknowledgements

We thank Julie Henry and Julian Higgins for their helpful advice on a previous version of this paper. We also thank Essential Research for providing access to their polling data. Finally, we thank the dozens of authors of papers included in the meta-analyses who provided data and helped clarify their analyses.

Author Contributions

M.H. conceived and designed the meta-analyses, and led the writing. E.H. gathered and analyzed the data, and co-wrote the paper. P.B. and K.F. contributed expertise in terms of materials and analysis tools, contributed to the design of the meta-analysis, and co-wrote the paper.

Competing Financial Interests

The authors declare no competing financial interests.

Figure Legends

Figure 1. Correlations between climate change belief and demographic variables. Sex is coded male = 0, female = 1; race was coded as 1=White, 2=Non-White. Higher scores on the political affiliation and political ideology represent more "left-wing" voting intentions and ideologies respectively. Error bars represent 95% confidence intervals.

Figure 2. Correlations between antecedent variables and climate change belief. Error bars represent 95% confidence intervals.

Figure 3. Correlations between climate change belief and outcome variables. Error bars represent 95% confidence intervals.

Table1: Data summary

	Correlation	*Q (total heterogeneity)*	*k (number of studies)*	I^2	T^2
Demographics					
Sex	0.029	59.42	25	59.61	0.001
Age	-0.125	178.38	25	86.55	0.003
Income	0.057	21.03	23	0.00	0.000
Education	0.117	109.80	22	80.87	0.002
Race	0.032	8.08	12	0.00	0.000
Political affiliation	0.301	68.01	20	72.06	0.004
Political ideology	0.149	338.20	30	91.43	0.015
Antecedents of climate change beliefs					
Objective knowledge	0.253	383.28	17	95.83	0.033
Subjective knowledge	0.182	459.36	33	93.03	0.012
Trust in scientists	0.365	359.51	23	93.88	0.019
Perceived scientific consensus	0.349	427.92	30	93.22	0.016
New environmental paradigm	0.493	547.63	38	93.24	0.035
Activist/green identity	0.229	458.95	16	96.73	0.026
Biospheric values	0.252	46.52	6	89.25	0.009
Individualistic cultural values	-0.275	150.63	14	91.37	0.010
Hierarchical cultural values	-0.258	102.94	16	85.43	0.006
Free-market ideology	-0.296	242.43	30	88.04	0.018
Experience of extreme weather	0.052	28.44	9	71.87	0.002

Experience of local weather change	0.336	446.91	17	96.42	0.042
Environmental cues	0.219	97.56	15	85.65	0.018
Consequences of climate change beliefs					
Public pro-env. intentions	0.251	751.13	44	94.28	0.019
Private pro-env. intentions	0.316	1105.55	65	94.21	0.023
Public pro-env. behaviour	0.188	155.86	23	85.88	0.007
Private pro-env. behaviour	0.173	857.14	38	95.68	0.018
Policy support	0.324	681.48	25	96.48	0.030
Support for carbon tax/cap & trade	0.207	290.47	31	89.67	0.014
Willingness to prioritize environment over economy	0.384	180.88	20	89.50	0.009

Note. All correlations are pooled effects, and are significant at $p<.005$. Q-statistics were derived using a random-effects model, and were significant at $p<.01$ for every variable except income and race. Demographic data were based on polls from five research organizations. All five measured sex and age. Education was measured by Essential, Pew, Eurobarometer, and UK Department of Energy; income was measured by Essential, Pew, and UK Department of Energy; political affiliation was measured by Pew and Essential; political ideology was measured by Pew and ISSP; and race was measured by Pew, coded as 1=White, 2=Non-White.

Q=total variance, I^2=proportion of variability due to heterogeneity between studies rather than sampling error, T^2=between-study variance.

Method

Choosing variables. In deciding which correlates of climate change belief to include in the meta-analyses we were guided by two criteria. One criterion was whether there was a critical mass of studies to allow for reliable conclusions to be drawn. With this in mind, all the variables selected for the meta-analyses were assessed in five or more data sets. The second criterion was whether the variable was theoretically relevant to climate change beliefs, but *conceptually independent* of believing climate change is real. Some widely-researched variables pre-suppose that the participant believes in climate change (e.g., perceptions of risk presented by climate change; perceptions of efficacy about mitigating climate change) and to avoid circularity we did not examine these variables. Readers interested in finding out more about these variables can draw on recent reviews.[35,36]

Sampling data sets. When examining the relationship between demographic variables and climate change beliefs it is important to draw on data sets that use representative, stratified samples. Although there is academic literature that also uses these sampling techniques, we decided to base our observations on data by established polling companies and government agencies whose job it is to conduct large-scale, accurate polling of the broad population. These data are based on five major research organizations that measured belief in climate change: Pew Research (12 polls conducted in the U.S. 2006-2013), U.K. Department of Energy and Climate Change (three polls conducted among British participants 2012-2014), International Social Survey Programme: Environment III (ISSP, conducted across 32 countries in 2010); Essential Research (eight polls conducted among Australians 2010-2014), and Eurobarometer (conducted within 30 European nations by the European Commission in 2009).

For the remaining constructs – the thirteen psychological antecedents and seven consequences - we sampled from papers published in academic outlets on or before April

2014. We sampled any studies that (quantitatively) measured both belief in climate change and one of the 20 correlates included in the analysis. Most of these data sets were collected by academics for the purpose of their study, but some involved secondary analyses of larger data sets collected by research companies or government agencies. To prevent the same dataset and statistics being incorporated multiple times, we excluded studies that reported statistics for the same variables using the same dataset. Information about the search strategy - with details about how the final sample of 171 studies was identified - are provided in the PRISMA diagram in the supplementary materials. A summary of all the studies sampled, with a complete bibliography, can also be found in supplementary materials.

Analytic strategy. Meta-analyses were conducted using Comprehensive Meta-Analysis software. [30] Correlation coefficients were converted to Z-scores and then back-transformed for reporting. Because zero-order correlations (transformed) were used, we applied the standard weighting (n-3). We used random-effects meta-analysis to identify the average correlations across studies, weighted by the size of the samples. It should be noted that we examined each construct separately using separate random-effects meta-analyses, so direct statistical comparisons between effect sizes across constructs were not made.

In addition to average effects, indicators of variation across samples are also shown in Table 1. The *Q* statistic tests whether the amount of variation in effect sizes across studies occurs by chance. The I^2 statistic shows the proportion of this variation attributed to "true" differences in effect sizes across studies (with the remaining variation attributable to random error), with .25 indicating a low proportion, .50 a moderate proportion, and .75 a high proportion.[30] We include T^2 in the table for reference purposes as it represents the actual variance in true effects across studies. Meta regressions were performed separately for each variable showing moderate/ high proportions of "true" cross study variation, using a meta-

regression macro for the SPSS statistical program[37], with a random effects model and "method of moments" estimation.

References

1. Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Hmielowski, J. *Global warming's six Americans March 2012 & November 2011.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change. (2012).
2. Leviston, Z., Leitch, A., Greenhill, M., Leonard, R. & Walker, I. Australians' Views of Climate Change (Commonwealth Scientific and Industrial Research Organisation, 2011).
3. Pidgeon, N. Public understanding of, and attitudes to, climate change: UK and international perspectives and policy. *Climate Policy* **12(sup01)**, S85–S106 (2012).
4. Scruggs, L., & Benegal, S. Declining public concern about climate change: Can we blame the Great Recession? *Global Environmental Change* **22**, 505-515 (2012).
5. Antonio, R.J., & Brulle, R.J. The unbearable lightness of politics: Climate change denial and political polarization. *The Sociological Quarterly* **52**, 195-202 (2011).
6. Hoffman, A. J. The growing climate divide. *Nature Climate Change* **1**, 195-196 (2011).
7. McCright, A. M., & Dunlap, R. E. The politicization of climate change and polarization in the American public's views of global warming, 2001-2010. *The Sociological Quarterly* **52**, 155-194 (2011).
8. McCright, A.M., Dunlap, R.E., & Xiao, C. Increasing influence of party identification on perceived scientific agreement and support for government action on climate change in the USA, 2006-2012. *Weather, Climate, and Society* **6**, 194-201 (2013).
9. Dunlap, R. E., & McCright, A.M. Cool dudes: The denial of climate change among conservative white males in the United States. *Global Environmental Change* **21**, 1163-1172 (2011).

10. Kellstedt, P. M., Zahran, S., & Vedlitz, A. Personal efficacy, the information environment, and attitudes toward global warming and climate change in the United States. *Risk Analysis* **28**, 113-126 (2008).
11. Malka, A., Krosnick, J. A. & Langer, G. The association of knowledge with concern about global warming: Trusted information sources shape public thinking. *Risk Analysis* **29**, 633-47 (2009).
12. Guy, S., Kashima, Y., Walker, I., & O'Neill, S. Investigating the effects of knowledge and ideology on climate change beliefs, *European Journal of Social Psychology* **44**, 421-429 (2014).
13. Hamilton, L.C. Education, politics, and opinions about climate change: Evidence for interaction effects. *Climatic Change* **104**, 231-242 (2011).
14. Hamilton, L.C. Did the Arctic ice recover?: Demographics of true and false climate facts. *Weather, Climate, and Society* **4**, 236-249 (2012).
15. Hart, P. S., Nisbet, E. C., & Myers, T. A. Public attention to science and political news and support for climate change mitigation. *Nature Climate Change* **5**, 541-545 (2015).
16. Kahan, D.M. et al. The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change* **2**, 732-735 (2012).
17. Whitmarsh, L. Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Global Environmental Change* **21**, 690-700 (2011).
18. Ding, D., Maibach, E.W., Zhao, X., Roser-Renouf, C., & Leiserowitz, A. Support for climate policy and societal action are linked to perceptions about scientific agreement. *Nature Climate Change* **1**, 462-466 (2011).

19. Lewandowsky, S., Gignac, G., & Vaughan, S. The pivotal role of perceived scientific consensus in acceptance of science. *Nature Climate Change* **3**, 399-404 (2013).

20. McCright, A.M., Dunlap, R.E., & Xiao, C. Perceived scientific agreement and support for government action on climate change in the USA. *Climatic Change* **119**, 511-518 (2013).

21. Dunlap, R.E., Van Liere, K.D., Mertig, A.G., & Jones, R.E. Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues* **56**, 425–442 (2000).

22. Schwartz, S.H. Are there universal aspects in the content and structure of values? *Journal of Social Issues* **50**, 19-45 (1994).

23. Stern, P. C., Dietz, T., Kalof, L., & Guagnano, G.A. Values, beliefs, and proenvironmental action: Attitude formation toward emergent attitude objects. *Journal of Applied Social Psychology* **25**, 1611-1636 (1995).

24. Douglas, M., & Wildavsky, A. *Risk and culture: An essay on the selection of technological and environmental dangers.* University of California Press, Berkeley. (1982).

25. Kahan, D.M., Jenkins-Smith, H., & Braman, D. Cultural cognition of scientific consensus. *Journal of Risk Research* **14**, 147-174 (2011).

26. Heath, Y., & Gifford, R. Free-market ideology and environmental degradation: The case of belief in global climate change. *Environment and Behavior* **38**, 48-71 (2006).

27. Lewandowsky, S., Oberauer, K., & Gignac, G. NASA faked the moon landing – Therefore (climate) science is a hoax: An anatomy of the motivated rejection of science. *Psychological Science* **24**, 622-633 (2013).

28. Spence, A., Poortinga, W., Butler, C., & Pidgeon, N. F. Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change* **1**, 46-49 (2011).

29. Stern, P.C. Toward a coherent theory of environmentally significant behaviour. *Journal of Social Issues* **56**, 407-424 (2000).

30. Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. *Introduction to meta-analysis*. Hoboken, NJ: Wiley. (2009).

31. Hsu, A., Emerson, J., Levy, M., de Sherbinin, A., Johnson, L., Malik, O., Schwartz, J., & Jaiteh, M. *The 2014 Environmental Performance Index.* New Haven, CT: Yale Center for Environmental Law and Policy. (2014).

32. Feygina, I., Jost, J.T., & Goldsmith, R.E. System justification, the denial of global warming, and the possibility of system-sanctioned change. *Personality and Social Psychology Bulletin* **36,** 326–338 (2010).

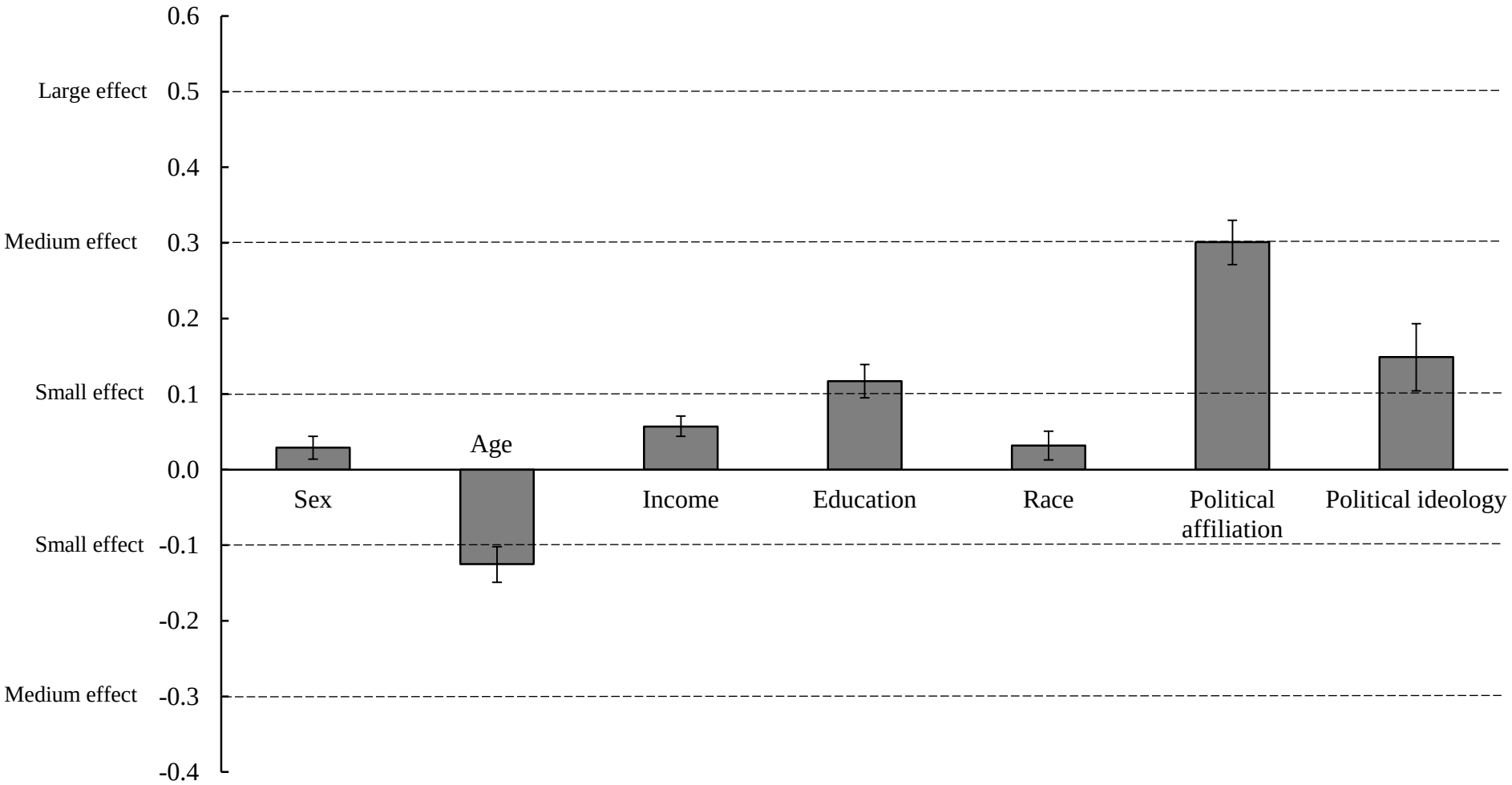
33. Bain, P.G.**,** Hornsey, M. J., Bongiorno, R., & Jeffries, C. Promoting pro-environmental action in climate change deniers. *Nature Climate Change* **2**, 600-603 (2012).

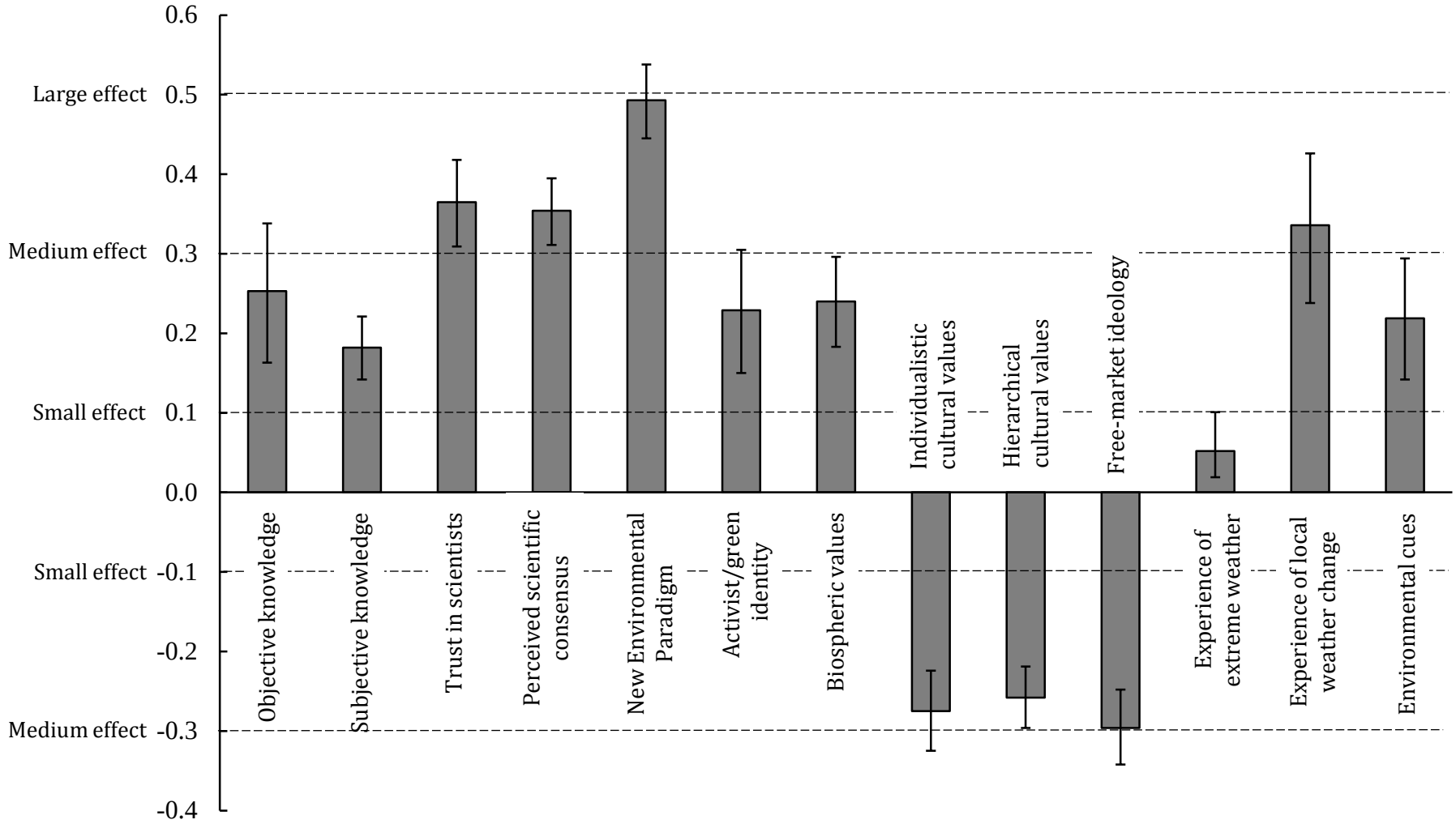
34. Bain, P. G., Milfont, T. L., Kashima, Y. & et al. Co-benefits of addressing climate change can motivate action around the world. *Nature Climate Change*, doi:10.1038/NCLIMATE2814 (in press).

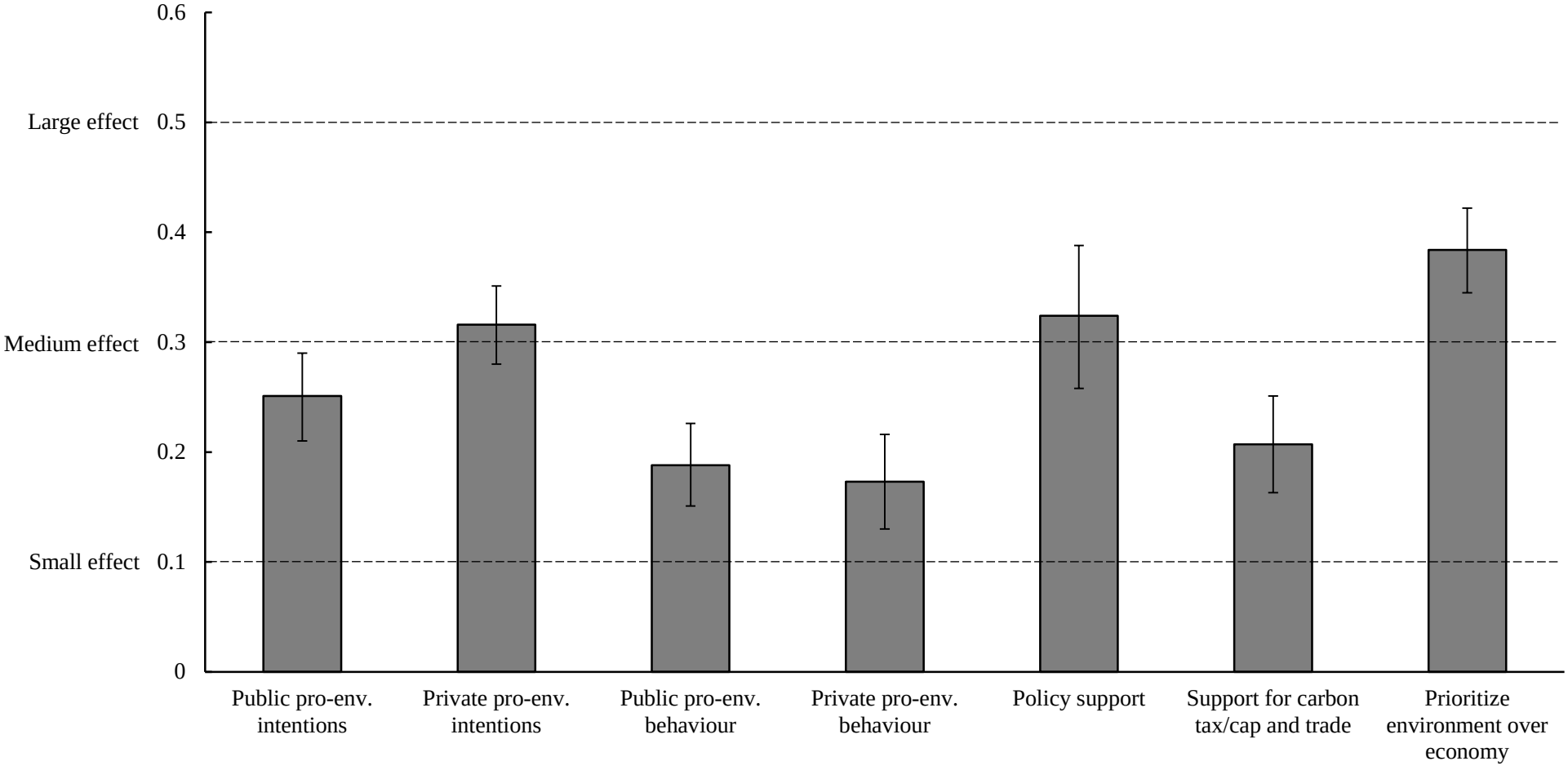
35. Hornsey, M.J. et al. Evidence for motivated control: Understanding the paradoxical link between threat and efficacy beliefs about climate change. *Journal of Environmental Psychology* **42**, 57-65 (2015).

36. Reser, J. P., & Swim, J. K. Adapting to and coping with the threat and impacts of climate change. *American Psychologist* **66**, 277-289 (2011).

37. Wilson, D. B. Meta-analysis macros for SAS, SPSS, and Stata. *Retrieved October 28, 2011* from http://mason.gmu.edu/~dwilsonb/ma.html (2005).


0.6
Large effect
0.5
0.4
Medium effect
0.3
0.2
Small effect
0.1
0.0
Small effect
-0.1
-0.2
Medium effect
-0.3
-0.4
Sex
Age
Income
Education
Race
Political affiliation
Political ideology


0.6
Large effect
0.5
0.4
Medium effect
0.3
0.2
Small effect
0.1
0.0
Small effect
-0.1
-0.2
Medium effect
-0.3
-0.4
Objective knowledge
Subjective knowledge
Trust in scientists
Perceived scientific consensus
New Environmental Paradigm
Activist/green identity
Biospheric values
Individualistic cultural values
Hierarchical cultural values
Free-market ideology
Experience of extreme weather
Experience of local weather change
Environmental cues


0.6
Large effect
0.5
0.4
Medium effect
0.3
0.2
Small effect
0.1
0
Public pro-env. intentions
Private pro-env. intentions
Public pro-env. behaviour
Private pro-env. behaviour
Policy support
Support for carbon tax/cap and trade
Prioritize environment over economy

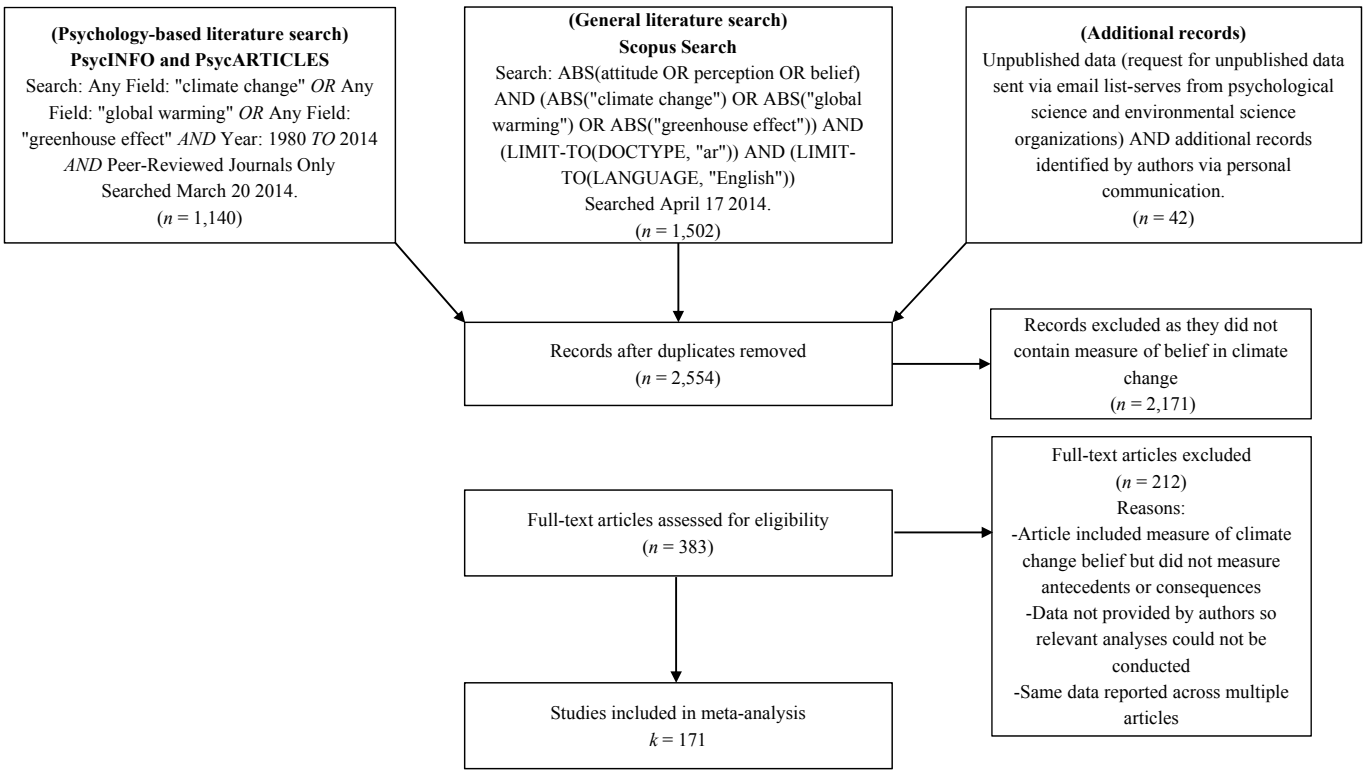
nature climate change

SUPPLEMENTARY INFORMATION

DOI: 10.1038/NCLIMATE2943

Meta-analyses of the determinants and outcomes of belief in climate change

Supplementary Figure 1.
PRISMA flow diagram describing decision rules for identification, screening, eligibility, and inclusion



Supplementary Table 1

Studies measuring anthropogenic (A) or general (G) climate change belief included in the meta-analyses.

Reference	Country	CC Measure	*Variable*	Correlation	Sample Size
Aitken, C., Chapman, R., & McClure, J. (2011)	New Zealand	A	*Subjective knowledge*	0.170	192
Akter, S., & Bennett, J. (2011)	Australia	A	*Private pro-env. behavior*	0.057	837
			Public pro-env. intentions	0.013	726
Arbuckle Jr, J. G., Morton, L. W., & Hobbs, J. (2013)	USA	A	*Policy support*	0.538	1250
Arbuckle Jr, J. G., Prokopy, L. S., Haigh, T., Hobbs, J., Knoot, T., Knutson, C., . . . Morton, L. W. (2013)	USA	A	*Policy support*	0.386	4387
Attari, S. Z., Gowrisankaran, G., Simpson, T., & Marx, S. M. (2014)	USA	A	*New Environmental Paradigm*	0.264	141
			Private pro-env. behavior	0.083	136
			Private pro-env. intentions	0.060	137
			Public pro-env. behavior	0.076	140
Barnes, A., Islam, M. M., & Toma, L. (2013) & Barnes, A. P., & Toma, L. (2012) & Islam, M. M., Barnes, A., & Toma, L. (2013)	UK	G	*Activist/green identity*	0.060	533
Bird, D. K., Haynes, K., van den Honert, R., McAneney, J., & Poortinga, W. (2014)	Australia	A	*Support for carbon tax/cap and trade*	0.116	1043
Bolsen, T., Leeper, T. J., & Shapiro, M. A. (2014)					
Study 1	USA	A	*Private pro-env. intentions*	0.276	622
			Support for carbon tax/cap and trade	0.217	622
Study 2	USA	A	*Perceived scientific consensus*	0.003	206

			Private pro-env. intentions	0.242	1275
			Support for carbon tax/cap and trade	0.251	1275
Borick, C., Lachapelle, E., & Rabe, B. (2011)	USA	A	*Public pro-env. intentions*	0.214	486
			Support for carbon tax/cap and trade	0.152	396
			Trust in scientists	0.375	517
Borick, C. P., & Rabe, B. G. (2010)					
National Sample (oversample)	USA	A	*Policy support*	0.038	1372
			Public pro-env. intentions	0.263	1458
			Support for carbon tax/cap and trade	0.265	1403
			Trust in scientists	0.360	1458
Pennsylvania (oversample)	USA	A	*Policy support*	0.003	196
			Public pro-env. intentions	0.275	173
			Support for carbon tax/cap and trade	0.210	186
			Trust in scientists	0.413	193
Virginia (oversample)	USA	A	*Policy support*	0.039	420
			Public pro-env. intentions	0.220	372
			Support for carbon tax/cap and trade	0.222	416
			Trust in scientists	0.385	422
California (oversample)	USA	A	*Policy support*	0.089	189
			Public pro-env. intentions	0.156	179

			Support for carbon tax/cap and trade	0.299	204
			Trust in scientists	0.269	210
Borick, C. P., & Rabe, B. G. (2011)	USA	A	*Public pro-env. intentions*	0.310	507
			Support for carbon tax/cap and trade	0.206	491
			Trust in scientists	0.282	524
Boyes, E., Skamp, K., & Stanisstreet, M. (2009) & Boyes, E., & Stanisstreet, M. (2012) & Boyes, E., Stanisstreet, M., Skamp, K., Rodriguez, M., Malandrakis, G., Fortner, R. W., . . . Yoon, H. G. (2014), & Skamp, K., Boyes, E., & Stanisstreet, M. (2013)					
	Australia	G	*Private pro-env. behavior*	0.251	492
			Private pro-env. intentions	0.205	491
			Public pro-env. intentions	0.244	489
			Subjective knowledge	0.482	491
			Support for carbon tax/cap and trade	0.127	489
	UK	G	*Private pro-env. behavior*	0.136	746
			Subjective knowledge	0.356	745
			Private pro-env. intentions	0.143	754
			Public pro-env. intentions	0.214	753
			Support for carbon tax/cap and trade	0.078	753
Boyes, E., Stanisstreet, M., Skamp, K., Rodriguez, M., Malandrakis, G., Fortner, R. W., . . . Yoon, H. G. (2014)	Brunei	G	*Private pro-env. behavior*	0.062	1063

		Private pro-env. intentions	0.093	1057
		Public pro-env. intentions	0.117	1058
		Subjective knowledge	0.292	1063
		Support for carbon tax/cap and trade	0.013	1058
Greece	G	*Private pro-env. behavior*	0.108	1425
		Private pro-env. intentions	0.101	1421
		Public pro-env. intentions	0.154	1423
		Subjective knowledge	0.298	1427
		Support for carbon tax/cap and trade	0.104	1421
India	G	*Private pro-env. behavior*	0.193	605
		Private pro-env. intentions	0.146	600
		Public pro-env. intentions	0.165	601
		Subjective knowledge	0.261	705
		Support for carbon tax/cap and trade	0.074	599
Korea	G	*Private pro-env. behavior*	0.094	1212
		Private pro-env. intentions	0.160	1215
		Public pro-env. intentions	0.123	1216
		Subjective knowledge	0.274	1213
		Support for carbon tax/cap and trade	0.105	1216
Oman	G	*Private pro-env. behavior*	0.144	921
		Private pro-env. intentions	0.087	910

		Public pro-env. intentions	0.072	915
		Subjective knowledge	0.297	921
		Support for carbon tax/cap and trade	0.029	911
Singapore	G	*Private pro-env. behavior*	0.206	717
		Private pro-env. intentions	0.147	718
		Public pro-env. intentions	0.173	718
		Subjective knowledge	0.420	717
		Support for carbon tax/cap and trade	0.061	718
Spain	G	*Private pro-env. behavior*	0.178	1460
		Private pro-env. intentions	0.144	1460
		Public pro-env. intentions	0.138	1460
		Subjective knowledge	0.280	1460
		Support for carbon tax/cap and trade	0.197	1460
Turkey	G	*Private pro-env. behavior*	0.114	741
		Private pro-env. intentions	0.061	737
		Public pro-env. intentions	0.035	741
		Subjective knowledge	0.114	742
		Support for carbon tax/cap and trade	0.030	739
USA	G	*Private pro-env. behavior*	0.258	708
		Private pro-env. intentions	0.203	709
		Public pro-env. intentions	0.241	708

			Subjective knowledge	0.381	708
			Support for carbon tax/cap and trade	0.243	707
Brenkert-Smith, H., Champ, P. A., & Telligman, A. L. (2013a) & Brenkert-Smith, H., Champ, P. A., & Telligman, A. L. (2013b)	USA	A	*Experience of extreme weather*	0.013	363
			Perceived scientific consensus	0.590	362
			Subjective knowledge	0.221	362
Brick, C. (2013)	USA	A	*Private pro-env. behavior*	0.142	200
			Public pro-env. behavior	0.192	200
			Objective knowledge	0.221	200
			Subjective knowledge	0.130	200
			Trust in scientists	0.602	200
Budescu, D. V., Broomell, S., & Por, H. (2009)	USA	A	*Free-market ideology*	-0.371	223
			New Environmental Paradigm	0.607	223
			Private pro-env. intentions	0.564	223
Budescu, D. V., Por, H., Broomell, S. B., & Smithson, M. (2014)					
	Australia	A	*Free-market ideology*	-0.280	460
			New Environmental Paradigm	0.670	460
			Private pro-env. intentions	0.581	460
	Brazil	A	*Free-market ideology*	-0.290	422
			New Environmental Paradigm	0.400	421
			Private pro-env. intentions	0.381	421
	Canada	A	*Free-market ideology*	-0.380	443

		New Environmental Paradigm	0.650	443
		Private pro-env. intentions	0.500	443
Chile	A	*Free-market ideology*	-0.200	428
		New Environmental Paradigm	0.430	428
		Private pro-env. intentions	0.396	428
China	A	*Free-market ideology*	-0.210	417
		New Environmental Paradigm	0.540	417
		Private pro-env. intentions	0.372	416
Egypt	A	*Free-market ideology*	-0.270	328
		New Environmental Paradigm	0.430	328
		Private pro-env. intentions	0.258	328
France	A	*Free-market ideology*	-0.370	434
		New Environmental Paradigm	0.610	434
		Private pro-env. intentions	0.471	434
Germany	A	*Free-market ideology*	-0.230	427
		New Environmental Paradigm	0.580	417
		Private pro-env. intentions	0.445	427
Hong Kong	A	*Free-market ideology*	-0.280	420
		New Environmental Paradigm	0.590	420
		Private pro-env. intentions	0.321	420
India	A	*Free-market ideology*	-0.290	418
		New Environmental Paradigm	0.410	418
		Private pro-env. intentions	0.326	417

Israel (Arabic)	A	*Free-market ideology*	-0.050	223
		New Environmental Paradigm	0.320	221
		Private pro-env. intentions	0.185	221
Israel	A	*Free-market ideology*	-0.280	250
		New Environmental Paradigm	0.510	249
		Private pro-env. intentions	0.386	250
Italy	A	*Free-market ideology*	-0.260	439
		New Environmental Paradigm	0.580	439
		Private pro-env. intentions	0.296	439
Japan	A	*Free-market ideology*	-0.040	410
		New Environmental Paradigm	0.050	410
		Private pro-env. intentions	0.065	410
Korea	A	*Free-market ideology*	-0.230	400
		New Environmental Paradigm	0.570	400
		Private pro-env. intentions	0.310	399
Netherlands	A	*Free-market ideology*	-0.290	405
		New Environmental Paradigm	0.490	405
		Private pro-env. intentions	0.421	405
Poland	A	*Free-market ideology*	-0.290	411
		New Environmental Paradigm	0.530	411
		Private pro-env. intentions	0.407	411
Quebec	A	*Free-market ideology*	-0.310	412
		New Environmental Paradigm	0.570	412

		Private pro-env. intentions	0.416	412
Russia	A	*Free-market ideology*	-0.100	416
		New Environmental Paradigm	0.380	416
		Private pro-env. intentions	0.265	416
Slovakia	A	*Free-market ideology*	-0.250	421
		New Environmental Paradigm	0.510	421
		Private pro-env. intentions	0.252	421
South Africa	A	*Free-market ideology*	-0.270	398
		New Environmental Paradigm	0.510	398
		Private pro-env. intentions	0.451	398
Spain	A	*Free-market ideology*	-0.360	421
		New Environmental Paradigm	0.570	421
		Private pro-env. intentions	0.498	421
Sweden	A	*Free-market ideology*	-0.440	433
		New Environmental Paradigm	0.670	433
		Private pro-env. intentions	0.585	433
Taiwan	A	*Free-market ideology*	-0.210	319
		New Environmental Paradigm	0.570	319
		Private pro-env. intentions	0.335	319
Turkey	A	*Free-market ideology*	-0.300	404
		New Environmental Paradigm	0.500	404
		Private pro-env. intentions	0.405	404
UK	A	*Free-market ideology*	-0.330	420

			New Environmental Paradigm	0.670	420
			Private pro-env. intentions	0.541	420
	USA	A	*Free-market ideology*	-0.590	411
			New Environmental Paradigm	0.740	411
			Private pro-env. intentions	0.637	411
Bunting, A., Kashima, E. (2013)	Australia	A	*Hierarchical cultural values*	-0.346	284
			Individualistic cultural values	-0.296	294
			New Environmental Paradigm	0.236	285
			Policy support	0.410	284
			Private pro-env. intentions	0.205	284
			Public pro-env. intentions	0.486	284
			Subjective knowledge	0.024	284
Burnett, R. E., Vuola, A. J., Megalos, M. A., Adams, D. C., & Monroe, M. C. (2014)	USA	A	*Prioritize environment over economy*	0.330	2601
			Public pro-env. behavior	0.203	2601
Carley, S. R., Krause, R. M., Warren, D. C., Rupp, J. A., & Graham, J. D. (2012)	USA	A	*Activist/green identity*	0.056	1001
			Hierarchical cultural values	-0.140	1001
			Individualistic cultural values	-0.253	1001
			Policy support	0.375	1001
			Prioritize environment over economy	0.301	1001
Chesnes, T. C., & Joeckel, S. (2013)					
Student sample	USA	A	*Private pro-env. behavior*	0.183	2184

			Public pro-env. intentions	0.378	2181
Faculty	USA	A	*Private pro-env. behavior*	0.241	1781
			Public pro-env. intentions	0.492	1774
Cho, C. H., Martens, M. L., Kim, H., & Rodrigue, M. (2011)	Canada	A	*Perceived scientific consensus*	0.407	278
			Policy support	0.427	278
			Subjective knowledge	0.096	277
			Trust in scientists	0.559	278
Clarke, C., Shackleton, S., & Powell, M. (2012)	South Africa	A	*Experience of local weather change*	0.555	18
			Objective knowledge	-0.088	18
Cook, S. L., & Ma, Z. (2014)	USA	A	*Experience of local weather change*	0.430	372
			Prioritize environment over economy	0.290	390
Corner, A., Venables, D., Spence, A., Poortinga, W., Demski, C., & Pidgeon, N. (2011) & Poortinga, W., Spence, A., Whitmarsh, L., Capstick, S., & Pidgeon, N. F. (2011) & Spence, A., Poortinga, W., Butler, C., & Pidgeon, N. F. (2011) & Spence, A., Poortinga, W., & Pidgeon, N. (2012)	UK	A	*Activist/green identity*	0.248	2225
			Experience of extreme weather	0.065	2272
			Perceived scientific consensus	0.486	2195
			Private pro-env. intentions	0.242	2097
			Schwartz values: Biospheric	0.117	1558
Corner, A., Whitmarsh, L., & Xenias, D. (2012)	UK	A	*Activist/green identity*	0.171	173
			New Environmental Paradigm	0.473	173
			Perceived scientific consensus	0.139	89
Craig, T. (2010)	UK	A	*Private pro-env. behavior*	0.168	1040
			Schwartz values: Biospheric	0.248	1039
Egan, P. J., & Mullin, M. (2012)	USA	G	*Experience of extreme weather*	0.057	1618

				Experience of local weather change	0.032	6726
Elgin, D. J., & Weible, C. M. (2013)		USA	A	*Activist/green identity*	0.692	260
				Policy support	0.576	260
				Support for carbon tax/cap and trade	0.510	260
Eshchanov, B. R., Stultjes, M. G. P., Eshchanov, R. A., & Salaev, S. K. (2013)		Uzbekistan	G	*Private pro-env. behavior*	0.121	148
				Subjective knowledge	0.273	148
Feinberg, M., & Willer, R. (2011)						
	Study 1	USA	G	*Trust in scientists*	0.379	97
	Study 2	USA	G	*Private pro-env. intentions*	0.431	44
				Trust in scientists	0.407	44
Feldman, L., Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. (2011) & Leiserowitz, A., Maibach, E., & Roser-Renouf, C., (2008) & Leiserowitz, A., Maibach, E. W., Roser-Renouf, C., Smith, N., & Dawson, E. (2013) & Myers, T. A., Maibach, E. W., Roser-Renouf, C., Akerlof, K., & Leiserowitz, A. (2013) & Zhao, X., Leiserowitz, A., Maibach, E. W., & Roser-Renouf, C. (2011)						
		USA	A	*Hierarchical cultural values*	-0.276	2138
				Individualistic cultural values	-0.334	2134
				Perceived scientific consensus	0.343	2136
				Prioritize environment over economy	0.440	2090
				Public pro-env. behavior	0.197	1865
				Public pro-env. intentions	0.247	2098
Ferguson, M. A., & Branscombe, N. R. (2010)		USA	G	*Private pro-env. intentions*	0.355	74

				Support for carbon tax/cap and trade	0.379	74
Ferguson, M. A., Branscombe, N. R., & Reynolds, K. J. (2011)		USA	A	*Policy support*	0.633	33
				Private pro-env. intentions	0.487	33
				Public pro-env. intentions	0.497	33
				Support for carbon tax/cap and trade	0.429	33
Finzi Hart, J., Grifman, P., Moser, S., Abeles, A., Myers, M., Schlosser, S., & Ekstrom, J. (2012)		USA	A	*Subjective knowledge*	0.099	447
Fusco, E., Snider, A., & Luo, S. (2012)		USA	A	*Private pro-env. behavior*	0.429	437
				Public pro-env. behavior	0.520	441
Geiger, N., & Swim, J. (2012)						
	Study 1	USA	A	*Prioritize environment over economy*	0.222	194
				Public pro-env. behavior	0.091	194
	Study 2	USA	A	*Prioritize environment over economy*	0.153	126
				Public pro-env. behavior	-0.015	126
Geiger, N., & Swim, J. (2013a)		USA	A	*Public pro-env. intentions*	0.506	27
Geiger, N., & Swim, J. (2013b)		USA	A	*Perceived scientific consensus*	0.452	217
				Prioritize environment over economy	0.429	259
				Public pro-env. behavior	0.144	99
Geiger, S., Moreno, C., & Streiker-Diaz, J. (2012)		Argentina	G	*Activist/green identity*	0.177	246

				Experience of extreme weather	0.071	246
				Experience of local weather change	0.184	246
Glenk, K., & Colombo, S. (2011)		UK	A	*Prioritize environment over economy*	0.223	642
				Subjective knowledge	0.041	642
Guéguen, N. (2012)						
	Study 1	France	G	*Environmental cues*	0.373	60
				Experience of local weather change	0.576	60
	Study 2	France	G	*Environmental cues*	0.620	60
				Experience of local weather change	0.607	150
Haden, V. R., Niles, M. T., Lubell, M., Perlman, J., & Jackson, L. E. (2012)		USA	A	*Experience of local weather change*	0.222	138
				Private pro-env. intentions	0.411	151
Häkkinen, K. & Akrami, N. (2013)		Sweden	A	*New Environmental Paradigm*	0.537	103
				Perceived scientific consensus	0.325	103
Hamilton, L. C. (2012)		USA	A	*Objective knowledge*	0.307	2006
				Subjective knowledge	0.071	2006
Hamilton, L. C., Hartter, J., Safford, T. G., & Stevens, F. R. (2014)		USA	A	*Subjective knowledge*	0.098	10057
Hamilton, L. C., & Stampone, M. D. (2013)		USA	A	*Environmental cues*	0.025	5189
				Subjective knowledge	0.100	5215
Heath, Y., & Gifford, R. (2006)		Canada	A	*Free-market ideology*	-0.430	185
				Private pro-env. intentions	0.450	185

			Subjective knowledge	0.170	185
Hidalgo, M. C., & Pisano, I. (2010)	Spain	A	*Private pro-env. intentions*	0.206	84
Higginbotham, N., Connor, L. H., & Baker, F. (2014)	Australia	A	*Activist/green identity*	0.038	947
			Experience of extreme weather	0.172	947
			Experience of local weather change	0.170	947
			Private pro-env. behavior	0.073	947
			Public pro-env. behavior	0.206	947
Hine, D. W., Reser, J. P., Phillips, W. J., Cooksey, R., Marks, A. D. G., Nunn, P., . . . Glendon, A. I. (2013)					
Wave I	Australia	A	*Activist/green identity*	0.450	3096
			Experience of extreme weather	0.009	3096
			Objective knowledge	0.360	3096
			Policy support	0.284	2906
			Private pro-env. behavior	0.341	3096
			Private pro-env. intentions	0.444	3047
			Trust in scientists	0.460	3096
Wave II	Australia	A	*Activist/green identity*	0.299	4222
			Experience of extreme weather	0.006	4246
			Experience of local weather change	0.331	4246
			Objective knowledge	0.267	3847
			Perceived scientific consensus	0.493	4246
			Private pro-env. behavior	0.120	4246
			Private pro-env. intentions	0.425	4173

				Trust in scientists	0.473	4246
Howe, P. D., & Leiserowitz, A. (2013) & Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Smith, N. (2011)		USA	A	*Hierarchical cultural values*	-0.271	962
				Individualistic cultural values	-0.272	962
				Perceived scientific consensus	0.324	996
				Prioritize environment over economy	0.453	976
				Public pro-env. behavior	0.204	852
				Public pro-env. intentions	0.303	967
Jang, S. M. (2013)		USA	A	*Policy support*	0.579	249
Jaskulsky, L., & Besel, R. (2013)		USA	A	*Experience of local weather change*	0.567	43
				Policy support	0.262	43
				Private pro-env. intentions	0.233	43
				Support for carbon tax/cap and trade	0.249	43
				Trust in scientists	0.603	43
Joireman, J., Truelove, H. B., & Duell, B. (2010)						
	Study 1	USA	G	*Environmental cues*	0.240	93
				Experience of local weather change	0.461	93
				Schwartz values: Biospheric	0.014	93
	Study 2	USA	G	*Environmental cues*	0.263	42
				Experience of local weather change	0.627	42
				Schwartz values: Biospheric	0.536	41
	Study 3	USA	G	*Experience of local weather change*	0.564	159

				Schwartz values: Biospheric	0.494	159
				Support for carbon tax/cap and trade	0.604	159
Jolley, D., & Douglas, K. M. (2014)		UK	G	*Private pro-env. intentions*	0.275	69
				Trust in scientists	0.548	69
Jones, C. R., & Eiser, J. R. (2009)		UK	A	*Activist/green identity*	0.044	699
Jones, C. R., Eiser, J. R., & Gamble, T. R. (2012)						
	Study 1	UK	A	*Policy support*	0.493	94
	Study 2	UK	A	*Policy support*	0.209	109
	Study 3	UK	A	*Policy support*	0.202	172
Kellstedt, P. M., Zahran, S., & Vedlitz, A. (2008)		USA	A	*New Environmental Paradigm*	0.437	1004
				Subjective knowledge	0.071	1004
				Trust in scientists	0.171	1004
Kreibich, H. (2011)		Germany	A	*Experience of extreme weather*	0.012	423
Kriss, P. H., Loewenstein, G., Wang, X., & Weber, R. A. (2011)						
	Chinese Sample	China	A	*Hierarchical cultural values*	-0.044	285
				Subjective knowledge	0.057	288
	US Sample	USA	A	*Hierarchical cultural values*	-0.162	414
				Subjective knowledge	-0.009	429
Kroesen, M. (2013)		Netherlands	A	*New Environmental Paradigm*	0.336	456
				Policy support	0.282	491
				Private pro-env. behavior	0.151	491
				Private pro-env. intentions	0.183	491

			Subjective knowledge	0.087	491
			Support for carbon tax/cap and trade	0.227	491
Lachapelle, E., Borick, C. P., & Rabe, B. (2012)	Canada	G	*Public pro-env. intentions*	0.184	1077
			Support for carbon tax/cap and trade	0.161	1062
			Trust in scientists	0.413	1094
Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2010) & Leiserowitz, A., Maibach, E. W., Roser-Renouf, C., Smith, N., & Dawson, E. (2013)	USA	A	*Hierarchical cultural values*	-0.296	948
			Individualistic cultural values	-0.363	948
			Perceived scientific consensus	0.393	977
			Prioritize environment over economy	0.456	959
			Public pro-env. behavior	0.164	810
			Public pro-env. intentions	0.240	930
Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Howe, P. (2012)	USA	A	*Hierarchical cultural values*	-0.323	1017
			Individualistic cultural values	-0.314	1017
			Perceived scientific consensus	0.284	1061
			Prioritize environment over economy	0.446	1057
			Public pro-env. behavior	0.207	936
			Public pro-env. intentions	0.333	1052
Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Howe, P. (2013)	USA	A	*Hierarchical cultural values*	-0.304	1001

			Individualistic cultural values	-0.301	1001
			Perceived scientific consensus	0.332	1032
			Prioritize environment over economy	0.414	1031
			Public pro-env. behavior	0.177	916
			Public pro-env. intentions	0.358	1030
Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (2014)	USA	A	*Hierarchical cultural values*	-0.334	980
			Individualistic cultural values	-0.329	977
			Perceived scientific consensus	0.383	1007
			Prioritize environment over economy	0.499	1005
			Public pro-env. behavior	0.206	884
			Public pro-env. intentions	0.326	1001
Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., Rosenthal, S., & Marlon, J. (2014a)	USA	A	*Perceived scientific consensus*	0.400	818
			Prioritize environment over economy	0.519	810
			Public pro-env. behavior	0.292	730
			Public pro-env. intentions	0.348	810
Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., Rosenthal, S., & Marlon, J. (2014b)	USA	A	*Perceived scientific consensus*	0.371	1275
			Prioritize environment over economy	0.453	1268
			Public pro-env. behavior	0.210	1117
			Public pro-env. intentions	0.343	1271

Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Hmielowski, J. D. (2012)	USA	A	*Hierarchical cultural values*	-0.286	977
			Individualistic cultural values	-0.306	976
			Perceived scientific consensus	0.235	1000
			Prioritize environment over economy	0.408	970
			Public pro-env. behavior	0.194	888
			Public pro-env. intentions	0.291	983
Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Smith, N. (2010)	USA	A	*Hierarchical cultural values*	-0.349	1003
			Individualistic cultural values	-0.334	1002
			Perceived scientific consensus	0.302	1018
			Prioritize environment over economy	0.475	1001
			Public pro-env. behavior	0.226	861
			Public pro-env. intentions	0.296	994
Leiserowitz, A., Shome, D., Marx, S., Hammer, S., & Broad, K. (2008)	USA	A	*Experience of local weather change*	-0.008	732
			Hierarchical cultural values	-0.058	739
			Individualistic cultural values	0.127	707
			Policy support	0.088	721
			Perceived scientific consensus	0.066	754
			Private pro-env. intentions	0.068	666
			Public pro-env. intentions	0.060	740
Leviston, Z., & Walker, I. (2012)	Australia	A	*Private pro-env. behavior*	0.391	2565

Lewandowsky, S., Gignac, G. E., & Vaughan, S. (2013)					
Study 1	Australia	A	*Perceived scientific consensus*	0.430	200
Study 2	Australia	A	*Perceived scientific consensus*	0.699	100
Lewandowsky, S., Oberauer, K., & Gignac, G. E. (2013)	Australia	A	*Free-market ideology*	-0.520	1145
Li, Y., Johnson, E. J., & Zaval, L. (2011)					
Study 1a	USA	G	*Environmental cues*	0.245	582
Study 1b	Australia	G	*Environmental cues*	0.139	290
Study 2	USA	G	*Environmental cues*	0.098	251
			Private pro-env. behavior	0.170	251
Lin, S. (2013)	Taiwan	A	*Private pro-env. behavior*	0.063	223
			Private pro-env. intentions	0.140	223
			Public pro-env. intentions	0.074	223
			Support for carbon tax/cap and trade	0.025	223
Lombardi, D., Seyranian, V., & Sinatra, G. M. (2014)	USA	A	*Objective knowledge*	0.563	271
Lombardi, D., & Sinatra, G. M. (2012)	USA	A	*Objective knowledge*	0.283	55
Lombardi, D., & Sinatra, G. M. (2013)	USA	A	*Objective knowledge*	-0.069	85
Lombardi, D., Sinatra, G. M., & Nussbaum, E. M. (2013)	USA	A	*Objective knowledge*	0.066	172
Malka, A., Krosnick, J. A., & Langer, G. (2009)					
2006 Survey	USA	A	*Perceived scientific consensus*	0.291	977
			Subjective knowledge	0.121	987
			Trust in scientists	0.290	982
2007 Survey	USA	A	*Perceived scientific consensus*	0.288	962

				Subjective knowledge	0.063	993
				Trust in scientists	0.320	982
Markowitz, E. M. (2012)						
	Study 1	USA	G	*Perceived scientific consensus*	0.476	590
	Study 2	USA	A	*Private pro-env. intentions*	0.261	314
Markowski-Lindsay, M., Stevens, T., Kittredge, D. B., Butler, B. J., Catanzaro, P., & Dickinson, B. J. (2011)		USA	A	*Support for carbon tax/cap and trade*	0.567	166
Milfont, T. L., Richter, I., Sibley, C. G., Wilson, M. S., & Fischer, R. (2013) & Sibley, C. G., & Kurz, T. (2013)		New Zealand	A	*Policy support*	0.441	6269
				Private pro-env. behavior	0.188	6317
				Private pro-env. intentions	0.271	6327
				Schwartz values: Biospheric	0.242	6334
Morrison, M., Duncan, R., & Parton, K. A. (2013)		Australia	A	*Perceived scientific consensus*	0.358	1200
				Policy support	0.467	1403
				Private pro-env. behavior	0.113	855
				Private pro-env. intentions	0.137	1130
				Public pro-env. behavior	0.273	1382
				Public pro-env. intentions	0.294	1404
Perron, B., Vaillancourt, J. Durand, C. (2001).		Canada & Costa Rica	A	*Policy support*	0.216	220
				Support for carbon tax/cap and trade	0.253	220
Phillips, M., & Dickie, J. (2014)		UK	G	*Experience of local weather change*	0.041	153
				Private pro-env. behavior	0.145	147
Pidgeon, N. F., Lorenzoni, I., & Poortinga, W. (2008)		UK	G	*Activist/green identity*	0.400	1426

				Private pro-env. behavior	0.063	1426
				Public pro-env. behavior	0.066	1426
Price, J. C., Walker, I. A., & Boschetti, F. (2014)		Australia	A	*Private pro-env. behavior*	0.450	5081
Raymond, C. M., & Spoehr, J. (2013)		Australia	A	*Objective knowledge*	0.169	88
				Perceived scientific consensus	0.186	120
				Trust in scientists	0.112	122
Reynolds, T. W., Bostrom, A., Read, D., & Morgan, M. G. (2010)		USA	A	*Objective knowledge*	0.072	247
Risen, J. L., & Critcher, C. R. (2011)						
	Study 1	USA	G	*Environmental cues*	0.265	67
	Study 2	USA	G	*Environmental cues*	0.216	83
	Study 3	USA	G	*Environmental cues*	0.201	32
Rosentrater, L. D., Sælensminde, I., Ekström, F., Böhm, G., Bostrom, A., Hanss, D., & O'Connor, R. E. (2013)		Norway	A	*Public pro-env. intentions*	0.242	184
				Subjective knowledge	0.141	180
				Trust in scientists	0.241	179
Salomon, E. (2014)						
	Study 1	USA	A	*Public pro-env. intentions*	0.340	150
				Private pro-env. intentions	0.378	150
	Study 2	USA	A	*Policy support*	0.500	253
				Public pro-env. intentions	0.476	253
				Private pro-env. intentions	0.544	253
Santos, M. A. O. D. (2012)		South Africa	A	*Objective knowledge*	0.279	539
Schweizer, S., Davis, S., & Thompson, J. L. (2013)		USA	A	*Private pro-env. behavior*	0.242	3712

			Private pro-env. intentions	0.367	4034
			Public pro-env. intentions	0.018	3655
			Subjective knowledge	0.128	4022
Scott, F. L., Jones, C. R., & Webb, T. L. (2014)	UK	A	*Activist/green identity*	0.102	225
			Private pro-env. behavior	0.226	227
Sinatra, G. M., Kardash, C. M., Taasoobshirazi, G., & Lombardi, D. (2012)	USA	A	*Private pro-env. intentions*	0.370	137
Tam, J., & McDaniels, T. L. (2013)	Canada	G	*Activist/green identity*	0.221	281
			New Environmental Paradigm	0.457	273
Tobler, C., Visschers, V. H., & Siegrist, M. (2012a) & Tobler, C., Visschers, V. H. M., & Siegrist, M. (2012b)	Switzerland	A	*New Environmental Paradigm*	0.352	898
			Objective knowledge	0.249	903
			Policy support	0.328	891
			Prioritize environment over economy	0.234	897
			Private pro-env. intentions	0.167	889
			Public pro-env. intentions	0.223	885
			Support for carbon tax/cap and trade	0.327	887
Truelove, H. B., & Greenberg, M. (2013)	USA	A	*Activist/green identity*	0.220	2593
			Hierarchical cultural values	-0.317	2589
			Individualistic cultural values	-0.263	2615
			Trust in scientists	0.424	2568
Vignola, R., Klinsky, S., Tam, J., & McDaniels, T. (2013)	Costa Rica	A	*Objective knowledge*	-0.015	1462
			Policy support	0.074	1459

			Private pro-env. behavior	0.038	1456
			Public pro-env. behavior	0.049	1458
			Trust in scientists	0.097	1454
Von Borgstede, C., Andersson, M., & Johnsson, F. (2013)	Sweden	A	*Private pro-env. behavior*	0.203	599
			Public pro-env. intentions	0.432	453
Wachholz, S., Artz, N., & Chene, D. (2014)	USA	A	*Objective knowledge*	0.211	225
			Perceived scientific consensus	0.239	302
			Private pro-env. behavior	0.174	338
			Subjective knowledge	0.040	357
Wendling, Z. A., Attari, S. Z., Carley, S. R., Krause, R. M., Warren, D. C., Rupp, J. A., & Graham, J. D. (2013)	USA	A	*Activist/green identity*	0.166	987
			Hierarchical cultural values	-0.238	988
			Individualistic cultural values	-0.321	976
			Prioritize environment over economy	0.321	967
Whitmarsh, L. (2008a) & Whitmarsh (2008b) Whitmarsh, L. (2009) & Whitmarsh, L. (2011)	UK	G	*Activist/green identity*	0.151	546
			Experience of extreme weather	0.082	547
			Experience of local weather change	0.162	435
			New Environmental Paradigm	0.281	547
			Private pro-env. behavior	0.062	545
			Public pro-env. behavior	0.109	545
Whitmarsh, L. (2011) & Whitmarsh, L., & O'Neill, S. (2010) & Whitmarsh, L., O'Neill, S., Seyfang, G., & Lorenzoni, I. (2009)	UK	A	*New Environmental Paradigm*	0.218	497

			Private pro-env. behavior	0.051	497
Williamson, T., Parkins, J., & McFarlane, B. (2005)	Canada	A	*Objective knowledge*	0.834	99
			Perceived scientific consensus	0.096	54
			Subjective knowledge	0.210	54
			Trust in scientists	0.120	54
Wise, S. B. (2010)	USA	A	*Perceived scientific consensus*	0.425	543
Zaval, L., Keenan, E. A., Johnson, E. J., & Weber, E. U. (2014)					
Study 1	USA	G	*Environmental cues*	0.123	685
Study 2	USA	G	*Environmental cues*	0.193	272
			Objective knowledge	-0.046	272
Study 3a	USA	G	*Environmental cues*	0.187	195
Study 4	USA	G	*Environmental cues*	0.284	270
			Experience of local weather change	0.348	270

References

Aitken, C., Chapman, R., & McClure, J. (2011). Climate change, powerlessness and the commons dilemma: Assessing New Zealanders' preparedness to act. *Global Environmental Change, 21*, 752-760.

Akter, S., & Bennett, J. (2011). Household perceptions of climate change and preferences for mitigation action: The case of the Carbon Pollution Reduction Scheme in Australia. *Climatic Change, 109*, 417-436.

Arbuckle Jr, J. G., Morton, L. W., & Hobbs, J. (2013). Farmer beliefs and concerns about climate change and attitudes toward adaptation and mitigation: Evidence from Iowa. *Climatic Change, 118*, 551-563.

Arbuckle Jr, J. G., Prokopy, L. S., Haigh, T., Hobbs, J., Knoot, T., Knutson, C., . . . Morton, L. W. (2013). Climate change beliefs, concerns, and attitudes toward adaptation and mitigation among farmers in the Midwestern United States. *Climatic Change, 117*, 943-950.

Attari, S. Z., Gowrisankaran, G., Simpson, T., & Marx, S. M. (2014). *Does information feedback from in-home devices reduce electricity use? Evidence from a field experiment*. Unpublished manuscript, School of Public & Environmental Affairs, Indiana University, Bloomington, U.S.A.

Barnes, A., Islam, M. M., & Toma, L. (2013). Heterogeneity in climate change risk perception amongst dairy farmers: A latent class clustering analysis. *Applied Geography, 41*, 105-115.

Barnes, A. P., & Toma, L. (2012). A typology of dairy farmer perceptions towards climate change. *Climatic Change, 112*, 507-522.

Bird, D. K., Haynes, K., van den Honert, R., McAneney, J., & Poortinga, W. (2014). Nuclear power in Australia: A comparative analysis of public opinion regarding climate change and the Fukushima disaster. *Energy Policy, 65*, 644-653.

Bolsen, T., Leeper, T. J., & Shapiro, M. A. (2014). Doing what others do: Norms, science, and collective action on global warming. *American Politics Research, 42*, 65-89.

Borick, C., Lachapelle, E., & Rabe, B. (2011). Climate compared: Public opinion on climate change in the United States and Canada. *Issues in Governance Studies, 39,* 1-13.

Borick, C. P., & Rabe, B. G. (2010). A reason to believe: Examining the factors that determine individual views on global warming. *Social Science Quarterly, 91*, 777-800. doi: 10.1111/j.1540-6237.2010.00719.x

Borick, C. P., & Rabe, B. G. (2011). [National survey of American public opinion on climate change: Fall iteration]. Unpublished raw data.

Boyes, E., Skamp, K., & Stanisstreet, M. (2009). Australian secondary students' views about global warming: Beliefs about actions, and willingness to act. *Research in Science Education, 39*, 661-680.

Boyes, E., & Stanisstreet, M. (2012). Environmental education for behaviour change: Which actions should be targeted? *International Journal of Science Education, 34*, 1591-1614.

Boyes, E., Stanisstreet, M., Skamp, K., Rodriguez, M., Malandrakis, G., Fortner, R. W., . . . Yoon, H. G. (2014). An international study of the propensity of students to limit their use of private transport in light of their understanding of the causes of global warming. *International Research in Geographical and Environmental Education, 23*, 142-165.

Brenkert-Smith, H., Champ, P. A., & Telligman, A. L. (2013a). Understanding change: Wildfire in Boulder County, Colorado. *USDA Forest Service - Research Note RMRS-RN*(57).

Brenkert-Smith, H., Champ, P. A., & Telligman, A. L. (2013b). Understanding change: Wildfire in Larimer County, Colorado. *USDA Forest Service - Research Note RMRS-RN*(58).

Brick, C. (2013). [Attitudes and behaviours related to climate change]. Unpublished raw data.

Budescu, D. V., Broomell, S., & Por, H. (2009). Improving communication of uncertainty in the reports of the intergovernmental panel on climate change. *Psychological Science, 20*, 299-308. doi: 10.1111/j.1467-9280.2009.02284.x

Budescu, D. V., Por, H., Broomell, S. B., & Smithson, M. (2014). The interpretation of IPCC probabilistic statements around the world. *Nature Climate Change, 4*, 508-512.

Bunting, A., Kashima, E. (2013). *Psychological correlates of belief in climate change.* Unpublished manuscript, School of Psychology and Public Health, La Trobe University, Melbourne, Australia.

Burnett, R. E., Vuola, A. J., Megalos, M. A., Adams, D. C., & Monroe, M. C. (2014). North Carolina cooperative extension professionals' climate change perceptions, willingness, and perceived barriers to programming: An educational needs assessment. *Journal of Extension, 52*(1).

Carley, S. R., Krause, R. M., Warren, D. C., Rupp, J. A., & Graham, J. D. (2012). Early public impressions of terrestrial carbon capture and storage in a coal-intensive state. *Environmental science & technology, 46*, 7086-7093.

Chesnes, T. C., & Joeckel, S. (2013). Lynn White, Jr. and the Christian Academy: Environmental attitudes within Christian higher education. *Christian Higher Education, 12*, 296-306. doi: 10.1080/15363759.2011.598392

Cho, C. H., Martens, M. L., Kim, H., & Rodrigue, M. (2011). Astroturfing global warming: It isn't always greener on the other side of the fence. *Journal of Business Ethics, 104*, 571-587. doi: 10.1007/s10551-011-0950-6

Clarke, C., Shackleton, S., & Powell, M. (2012). Climate change perceptions, drought responses and views on carbon farming amongst commercial livestock and game farmers in the semiarid Great Fish River Valley, Eastern Cape province, South Africa. *African Journal of Range & Forage Science, 29*, 13-23.

Cook, S. L., & Ma, Z. (2014). Carbon sequestration and private rangelands: Insights from Utah landowners and implications for policy development. *Land Use Policy, 36*, 522-532. doi: 10.1016/j.landusepol.2013.09.021

Corner, A., Venables, D., Spence, A., Poortinga, W., Demski, C., & Pidgeon, N. (2011). Nuclear power, climate change and energy security: Exploring British public attitudes. *Energy Policy, 39*, 4823-4833.

Corner, A., Whitmarsh, L., & Xenias, D. (2012). Uncertainty, scepticism and attitudes towards climate change: Biased assimilation and attitude polarisation. *Climatic Change, 114*, 463-478.

Craig, T. (2010). [Climate change attitudes and carbon footprints in the Aberdeenshire region]. Unpublished data.

Egan, P. J., & Mullin, M. (2012). Turning personal experience into political attitudes: The effect of local weather on Americans' perceptions about global warming. *The Journal of Politics, 74*, 796-809. doi: 10.1017/S0022381612000448

Elgin, D. J., & Weible, C. M. (2013). A stakeholder analysis of Colorado climate and energy issues using Policy Analytical Capacity and the Advocacy Coalition Framework. *Review of Policy Research, 30*, 114-133.

Eshchanov, B. R., Stultjes, M. G. P., Eshchanov, R. A., & Salaev, S. K. (2013). Prospects of renewable energy penetration in Uzbekistan—Perception of the Khorezmian people. *Renewable and Sustainable Energy Reviews, 21*, 789-797.

Feinberg, M., & Willer, R. (2011). Apocalypse soon? Dire messages reduce belief in global warming by contradicting just-world beliefs. *Psychological Science, 22*, 34-38. doi: 10.1177/0956797610391911

Feldman, L., Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. (2011). Climate on cable: The nature and impact of global warming coverage on Fox News, CNN, and MSNBC. *The International Journal of Press/Politics*, 1940161211425410.

Ferguson, M. A., & Branscombe, N. R. (2010). Collective guilt mediates the effect of beliefs about global warming on willingness to engage in mitigation behavior. *Journal of Environmental Psychology, 30*, 135-142. doi: 10.1016/j.jenvp.2009.11.010

Ferguson, M. A., Branscombe, N. R., & Reynolds, K. J. (2011). The effect of intergroup comparison on willingness to perform sustainable behavior. *Journal of Environmental Psychology, 31*, 275-281. doi: http://dx.doi.org/10.1016/j.jenvp.2011.04.001

Finzi Hart, J.A., Grifman, P.M., Moser, S.C., Abeles, A., Myers, M.R., et al, 2012. *Rising to the challenge: Results of the 2011 Coastal California Adaptation Needs Assessment.* University of Southern California Sea Grant Program, Los Angeles.

Fusco, E., Snider, A., & Luo, S. (2012). Perception of global climate change as a mediator of the effects of major and religious affiliation on college students' environmentally responsible behavior. *Environmental Education Research, 18*, 815-830. doi: 10.1080/13504622.2012.672965

Geiger, N., & Swim, J. (2013a). [Neuroimaging study]. Unpublished raw data.

Geiger, N., & Swim, J. (2013b). [36-item Six Americas study]. Unpublished raw data.

Geiger, N., & Swim, J. (2012). [15-item Six Americas study]. Unpublished raw data.

Geiger, S., Moreno, C., & Streiker-Diaz, J. (2012). [Climate change perceptions in Argentina]. Unpublished raw data.

Glenk, K., & Colombo, S. (2011). Designing policies to mitigate the agricultural contribution to climate change: An assessment of soil based carbon sequestration and its ancillary effects. *Climatic Change, 105*, 43-66.

Guéguen, N. (2012). Dead indoor plants strengthen belief in global warming. *Journal of Environmental Psychology, 32*, 173-177. doi: 10.1016/j.jenvp.2011.12.002

Haden, V. R., Niles, M. T., Lubell, M., Perlman, J., & Jackson, L. E. (2012). Global and local concerns: What attitudes and beliefs motivate farmers to mitigate and adapt to climate change. *PLoS ONE, 7*, e52882.

Häkkinen, K. & Akrami, N. (2013). [Environmental attitudes and beliefs in Sweden]. Unpublished raw data.

Hamilton, L. C. (2012). Did the Arctic ice recover? Demographics of true and false climate facts. *Weather, Climate, and Society, 4*, 236-249.

Hamilton, L. C., Hartter, J., Safford, T. G., & Stevens, F. R. (2014). Rural environmental concern: Effects of position, partisanship, and place. *Rural Sociology, 79*, 257-281.

Hamilton, L. C., & Stampone, M. D. (2013). Blowin'in the wind: Short-term weather and belief in anthropogenic climate change. *Weather, Climate, and Society, 5*(2), 112-119.

Heath, Y., & Gifford, R. (2006). Free-market ideology and environmental degradation: The case of belief in global climate change. *Environment and Behavior, 38*, 48-71. doi: 10.1177/0013916505277998

Hidalgo, M. C., & Pisano, I. (2010). Determinants of risk perception and willingness to tackle climate change. A pilot study. *Psyecology, 1*, 105-112.

Higginbotham, N., Connor, L. H., & Baker, F. (2014). Subregional differences in Australian climate risk perceptions: Coastal versus agricultural areas of the Hunter Valley, NSW. *Regional Environmental Change, 14*, 699-712. doi: 10.1007/s10113-013-0529-0

Hine, D. W., Reser, J. P., Phillips, W. J., Cooksey, R., Marks, A. D. G., Nunn, P., . . . Glendon, A. I. (2013). Identifying climate change interpretive communities in a large Australian sample. *Journal of Environmental Psychology, 36*, 229-239. doi: 10.1016/j.jenvp.2013.08.006

Howe, P. D., & Leiserowitz, A. (2013). Who remembers a hot summer or a cold winter? The asymmetric effect of beliefs about global warming on perceptions of local climate conditions in the US. *Global Environmental Change, 23*, 1488-1500.

Islam, M. M., Barnes, A., & Toma, L. (2013). An investigation into climate change scepticism among farmers. *Journal of Environmental Psychology, 34*, 137-150. doi: 10.1016/j.jenvp.2013.02.002

Jang, S. M. (2013). Framing responsibility in climate change discourse: Ethnocentric attribution bias, perceived causes, and policy attitudes. *Journal of Environmental Psychology, 36*, 27-36. doi: 10.1016/j.jenvp.2013.07.003

Jaskulsky, L., & Besel, R. (2013). Words that (don't) matter: An exploratory study of four climate change names in environmental discourse. *Applied Environmental Education & Communication, 12*, 38-45.

Joireman, J., Truelove, H. B., & Duell, B. (2010). Effect of outdoor temperature, heat primes and anchoring on belief in global warming. *Journal of Environmental Psychology, 30*, 358-367. doi: 10.1016/j.jenvp.2010.03.004

Jolley, D., & Douglas, K. M. (2014). The social consequences of conspiracism: Exposure to conspiracy theories decreases intentions to engage in politics and to reduce one's carbon footprint. *British Journal of Psychology, 105*, 35-56. doi: 10.1111/bjop.12018

Jones, C. R., & Eiser, J. R. (2009). Identifying predictors of attitudes towards local onshore wind development with reference to an English case study. *Energy Policy, 37*(11), 4604-4614.

Jones, C. R., Eiser, J. R., & Gamble, T. R. (2012). Assessing the impact of framing on the comparative favourability of nuclear power as an electricity generating option in the UK. *Energy Policy, 41*, 451-465.

Kellstedt, P. M., Zahran, S., & Vedlitz, A. (2008). Personal efficacy, the information environment, and attitudes toward global warming and climate change in the United States. *Risk Analysis, 28*, 113-126. doi: 10.1111/j.1539-6924.2008.01010.x

Kreibich, H. (2011). Do perceptions of climate change influence precautionary measures? *International Journal of Climate Change Strategies and Management, 3*, 189-199.

Kriss, P. H., Loewenstein, G., Wang, X., & Weber, R. A. (2011). Behind the veil of ignorance: Self-serving bias in climate change negotiations. *Judgment and Decision Making, 6*, 602-615.

Kroesen, M. (2013). Exploring people's viewpoints on air travel and climate change: Understanding inconsistencies. *Journal of Sustainable Tourism, 21*, 271-290.

Lachapelle, E., Borick, C. P., & Rabe, B. (2012). Public attitudes toward climate science and climate policy in federal systems: Canada and the United States compared. *Review of Policy Research, 29*, 334-357.

Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2008) *Climate change in the American mind: Americans' climate change beliefs, attitudes, policy preferences, and actions.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2010) *Climate change in the American Mind: Americans' global warming beliefs and attitudes in January 2010.* Yale

University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Howe, P. (2012) *Climate change in the American mind: Americans' global warming beliefs and attitudes in September, 2012.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Howe, P. (2013) *Climate change in the American mind: Americans' global warming beliefs and attitudes in April, 2013.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (2014) *Climate change in the American mind: Americans' global warming beliefs and attitudes in April, 2014.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., Rosenthal, S., & Marlon, J. (2014) *Climate change in the American mind: Americans' global warming beliefs and attitudes in November, 2013.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., Rosenthal, S., & Marlon, J. (2014) *Climate change in the American mind: Americans' global warming beliefs and attitudes in October, 2014.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Hmielowski, J. D. (2012) *Climate change in the American Mind: Americans' global warming beliefs and attitudes in March*

2012. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Smith, N. (2010) *Climate change in the American Mind: Americans' global warming beliefs and attitudes in June 2010.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Smith, N. (2011) *Climate change in the American Mind: Americans' global warming beliefs and attitudes in May 2011.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication.

Leiserowitz, A., Maibach, E. W., Roser-Renouf, C., Smith, N., & Dawson, E. (2013). Climategate, public opinion, and the loss of trust. *American Behavioral Scientist, 57*(6), 818-837.

Leiserowitz, A., Shome, D., Marx, S., Hammer, S., and Broad, K. (2008) *The New York City global warming survey*. A Columbia University/Yale University Poll. New Haven, CT: Yale Project on Climate Change.

Leviston, Z., & Walker, I. (2012). Beliefs and denials about climate change: An Australian perspective. *Ecopsychology, 4*, 277-285. doi: 10.1089/eco.2012.0051

Lewandowsky, S., Gignac, G. E., & Vaughan, S. (2013). The pivotal role of perceived scientific consensus in acceptance of science. *Nature Climate Change, 3*, 399-404.

Lewandowsky, S., Oberauer, K., & Gignac, G. E. (2013). NASA faked the moon landing—therefore, (climate) science is a hoax: An anatomy of the motivated rejection of science. *Psychological Science, 24*, 622-633. doi: 10.1177/0956797612457686

Li, Y., Johnson, E. J., & Zaval, L. (2011). Local warming: Daily temperature change influences belief in global warming. *Psychological Science, 22*, 454-459. doi: 10.1177/0956797611400913

Lin, S. (2013). The gap between global issues and personal behaviors: pro-environmental behaviors of citizens toward climate change in Kaohsiung, Taiwan. *Mitigation and Adaptation Strategies for Global Change, 18*, 773-783.

Lombardi, D., Seyranian, V., & Sinatra, G. M. (2014). Source effects and plausibility judgments when reading about climate change. *Discourse Processes, 51*, 75-92. doi: 10.1080/0163853X.2013.855049

Lombardi, D., & Sinatra, G. M. (2012). College students' perceptions about the plausibility of human-induced climate change. *Research in Science Education, 42*, 201-217.

Lombardi, D., & Sinatra, G. M. (2013). Emotions about teaching about human-induced climate change. *International Journal of Science Education, 35*, 167-191.

Lombardi, D., Sinatra, G. M., & Nussbaum, E. M. (2013). Plausibility reappraisals and shifts in middle school students' climate change conceptions. *Learning and Instruction, 27*, 50-62. doi: 10.1016/j.learninstruc.2013.03.001

Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., & Mertz, C. (2011). Identifying like-minded audiences for global warming public engagement campaigns: An audience segmentation analysis and tool development. *PLoS ONE, 6*, e17571.

Malka, A., Krosnick, J. A., & Langer, G. (2009). The association of knowledge with concern about global warming: Trusted information sources shape public thinking. *Risk Analysis, 29*, 633-647. doi: 10.1111/j.1539-6924.2009.01220.x

Markowitz, E. M. (2012). Is climate change an ethical issue? Examining young adults' beliefs about climate and morality. *Climatic Change, 114*, 479-495.

Markowski-Lindsay, M., Stevens, T., Kittredge, D. B., Butler, B. J., Catanzaro, P., & Dickinson, B. J. (2011). Barriers to Massachusetts forest landowner participation in carbon markets. *Ecological Economics, 71*, 180-190.

Milfont, T. L., Richter, I., Sibley, C. G., Wilson, M. S., & Fischer, R. (2013). Environmental consequences of the desire to dominate and be superior. *Personality and Social Psychology Bulletin, 39*, 1127-1138. doi: 10.1177/0146167213490805

Morrison, M., Duncan, R., & Parton, K. A. (2013). Targeting segments in the Australian community to increase support for climate change policy. *Australasian Marketing Journal (AMJ), 21*, 212-217. doi: 10.1016/j.ausmj.2013.09.001

Myers, T. A., Maibach, E. W., Roser-Renouf, C., Akerlof, K., & Leiserowitz, A. (2013). The relationship between personal experience and belief in the reality of global warming. *Nature Climate Change, 3*, 343-347.

Perron, B., Vaillancourt, J. Durand, C. (2001). A global problem for a global movement? An exploratory study of climate change perception by green groups' leaders from Quebec (Canada) and Costa Rica. *Society & Natural Resources, 14*, 837-855.

Phillips, M., & Dickie, J. (2014). Narratives of transition/non-transition towards low carbon futures within English rural communities. *Journal of Rural Studies, 34*, 79-95.

Pidgeon, N. F., Lorenzoni, I., & Poortinga, W. (2008). Climate change or nuclear power—No thanks! A quantitative study of public perceptions and risk framing in Britain. *Global Environmental Change, 18*, 69-85.

Poortinga, W., Spence, A., Whitmarsh, L., Capstick, S., & Pidgeon, N. F. (2011). Uncertain climate: An investigation into public scepticism about anthropogenic climate change. *Global Environmental Change, 21*, 1015-1024.

Price, J. C., Walker, I. A., & Boschetti, F. (2014). Measuring cultural values and beliefs about environment to identify their role in climate change responses. *Journal of Environmental Psychology, 37*, 8-20. doi: 10.1016/j.jenvp.2013.10.001

Raymond, C. M., & Spoehr, J. (2013). The acceptability of climate change in agricultural communities: Comparing responses across variability and change. *Journal of environmental management, 115*, 69-77.

Reynolds, T. W., Bostrom, A., Read, D., & Morgan, M. G. (2010). Now what do people know about global climate change? Survey studies of educated laypeople. *Risk Analysis, 30*, 1520-1538. doi: 10.1111/j.1539-6924.2010.01448.x

Risen, J. L., & Critcher, C. R. (2011). Visceral fit: While in a visceral state, associated states of the world seem more likely. *Journal of Personality and Social Psychology, 100*, 777-793. doi: 10.1037/a0022460

Rosentrater, L. D., Sælensminde, I., Ekström, F., Böhm, G., Bostrom, A., Hanss, D., & O'Connor, R. E. (2013). Efficacy trade-offs in individuals' support for climate change policies. *Environment and Behavior, 45*, 935-970.

Salomon, E. (2014). [Experimental and correlational research on the effect of efficacy beliefs and climate change attitudes and behaviors]. Unpublished raw data.

Santos, M. A. O. D. (2012). Investigating consumer knowledge of global warming based on Rogers' knowledge stage of the innovation decision process. *International Journal of Consumer Studies, 36*, 385-393. doi: 10.1111/j.1470-6431.2011.01069.x

Schweizer, S., Davis, S., & Thompson, J. L. (2013). Changing the conversation about climate change: A theoretical framework for place-based climate change engagement. *Environmental Communication: A Journal of Nature and Culture, 7*, 42-62.

Scott, F. L., Jones, C. R., & Webb, T. L. (2014). What do people living in deprived communities in the UK think about household energy efficiency interventions? *Energy Policy, 66*, 335-349.

Sibley, C. G., & Kurz, T. (2013). A model of climate belief profiles: How much does it matter if people question human causation? *Analyses of Social Issues and Public Policy, 13*, 245-261. doi: 10.1111/asap.12008

Sinatra, G. M., Kardash, C. M., Taasoobshirazi, G., & Lombardi, D. (2012). Promoting attitude change and expressed willingness to take action toward climate change in college students. *Instructional Science, 40*, 1-17. doi: 10.1007/s11251-011-9166-5

Skamp, K., Boyes, E., & Stanisstreet, M. (2013). Beliefs and willingness to act about global warming: Where to focus science pedagogy? *Science Education, 97*, 191-217. doi: 10.1002/sce.21050

Spence, A., Poortinga, W., Butler, C., & Pidgeon, N. F. (2011). Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change, 1*, 46-49.

Spence, A., Poortinga, W., & Pidgeon, N. (2012). The psychological distance of climate change. *Risk Analysis, 32*, 957-972. doi: 10.1111/j.1539-6924.2011.01695.x

Tam, J., & McDaniels, T. L. (2013). Understanding individual risk perceptions and preferences for climate change adaptations in biological conservation. *Environmental Science & Policy, 27*, 114-123.

Tobler, C., Visschers, V. H. M., & Siegrist, M. (2012a). Addressing climate change: Determinants of consumers' willingness to act and to support policy measures. *Journal of Environmental Psychology, 32*, 197-207. doi: 10.1016/j.jenvp.2012.02.001

Tobler, C., Visschers, V. H., & Siegrist, M. (2012b). Consumers' knowledge about climate change. *Climatic Change, 114*, 189-209.

Truelove, H. B., & Greenberg, M. (2013). Who has become more open to nuclear power because of climate change? *Climatic Change, 116*, 389-409.

Vignola, R., Klinsky, S., Tam, J., & McDaniels, T. (2013). Public perception, knowledge and policy support for mitigation and adaption to Climate Change in Costa Rica: Comparisons with North American and European studies. *Mitigation and Adaptation Strategies for Global Change, 18*, 303-323.

Von Borgstede, C., Andersson, M., & Johnsson, F. (2013). Public attitudes to climate change and carbon mitigation—Implications for energy-associated behaviours. *Energy Policy, 57*, 182-193.

Wachholz, S., Artz, N., & Chene, D. (2014). Warming to the idea: University students' knowledge and attitudes about climate change. *International Journal of Sustainability in Higher Education, 15*, 128-141.

Wendling, Z. A., Attari, S. Z., Carley, S. R., Krause, R. M., Warren, D. C., Rupp, J. A., & Graham, J. D. (2013). On the importance of strengthening moderate beliefs in climate science to foster support for immediate action. *Sustainability, 5*, 5153-5170.

Whitmarsh, L. (2008a). Are flood victims more concerned about climate change than other people? The role of direct experience in risk perception and behavioural response. *Journal of Risk Research, 11*, 351-374. doi: 10.1080/13669870701552235

Whitmarsh, L. (2008b). What's in a name? Commonalities and differences in public understanding of "climate change" and "global warming". *Public Understanding of Science*, *18*, 401–420

Whitmarsh, L. (2009). Behavioural responses to climate change: Asymmetry of intentions and impacts. *Journal of Environmental Psychology, 29*, 13-23. doi: 10.1016/j.jenvp.2008.05.003

Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Global Environmental Change, 21*, 690-700.

Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*, 305-314. doi: 10.1016/j.jenvp.2010.01.003

Whitmarsh, L., O'Neill, S., Seyfang, G., & Lorenzoni, I. (2009). Carbon capability: What does it mean, how prevalent is it, and how can we promote it. *Tyndall Centre for Climate Change Research, Norwich.*

Williamson, T., Parkins, J., & McFarlane, B. (2005). Perceptions of climate change risk to forest ecosystems and forest-based communities. *The Forestry Chronicle, 81*, 710-716.

Wise, S. B. (2010). Climate change in the classroom: Patterns, motivations, and barriers to instruction among Colorado science teachers. *Journal of Geoscience Education, 58*, 297-309.

Zaval, L., Keenan, E. A., Johnson, E. J., & Weber, E. U. (2014). How warm days increase belief in global warming. *Nature Climate Change, 4*, 143-147.

Zhao, X., Leiserowitz, A., Maibach, E. W., & Roser-Renouf, C. (2011). Attention to science/environment news positively predicts and attention to political news negatively predicts global warming risk perceptions and policy support. *Journal of Communication*, *61*, 713-731.