



Contents lists available at ScienceDirect

# Global Environmental Change

journal homepage: [www.elsevier.com/locate/gloenvcha](http://www.elsevier.com/locate/gloenvcha)



## Cool dudes: The denial of climate change among conservative white males in the United States

Aaron M. McCright<sup>a,\*</sup>, Riley E. Dunlap<sup>b</sup>

<sup>a</sup> Lyman Briggs College, Department of Sociology, Environmental Science and Policy Program, Michigan State University, E-185 Holmes Hall, East Lansing, MI 48825-1107, USA  
<sup>b</sup> Department of Sociology, Oklahoma State University, 006 Classroom Building, Stillwater, OK 74078-4062, USA

### ARTICLE INFO

#### Article history:

Received 17 January 2011  
Received in revised form 24 June 2011  
Accepted 28 June 2011

#### Keywords:

Political ideology  
Race  
Gender  
Climate change denial  
Public opinion

### ABSTRACT

We examine whether conservative white males are more likely than are other adults in the U.S. general public to endorse climate change denial. We draw theoretical and analytical guidance from the identity-protective cognition thesis explaining the white male effect and from recent political psychology scholarship documenting the heightened system-justification tendencies of political conservatives. We utilize public opinion data from ten Gallup surveys from 2001 to 2010, focusing specifically on five indicators of climate change denial. We find that conservative white males are significantly more likely than are other Americans to endorse denialist views on all five items, and that these differences are even greater for those conservative white males who self-report understanding global warming very well. Furthermore, the results of our multivariate logistic regression models reveal that the conservative white male effect remains significant when controlling for the direct effects of political ideology, race, and gender as well as the effects of nine control variables. We thus conclude that the unique views of conservative white males contribute significantly to the high level of climate change denial in the United States.

© 2011 Elsevier Ltd. All rights reserved.

### 1. Introduction

High consequence risks such as human-induced climate change are central to the current age of advanced modernity (Beck, 2010a, 2010b; Giddens, 2009). Because of the mounting political and economic stakes of dealing with climate change, this global environmental problem has become extremely controversial in the US, and American efforts to deal with it have provoked a significant degree of denial—both of the reality of climate change and of its status as a problem deserving amelioration (Dunlap and McCright, 2010, 2011; McCright and Dunlap, 2010). A growing body of recent scholarship has analyzed the strategies, techniques, and effectiveness of fossil fuels (and other) industry organizations (e.g., Freudenburg et al., 2008; Lahsen, 2005; Layzer, 2007), conservative think tanks (e.g., Lahsen, 2005; McCright and Dunlap, 2000, 2003; Oreskes and Conway, 2008, 2010), contrarian scientists (e.g., Lahsen, 2008; McCright, 2007; McCright and Dunlap, 2003; Oreskes et al., 2008), and conservative Republican politicians

(e.g., McCright and Dunlap, 2003, 2010; Oreskes and Conway, 2010) in promoting climate change denial in the United States.

Even casual observers of denialist activities likely notice an obvious pattern; with rare exceptions (e.g., Sallie Baliunas), the most prominent denialists are conservative white males.<sup>1</sup> This is true for contrarian scientists (e.g., Patrick Michaels and Fred Singer), media pundits (e.g., Rush Limbaugh and Glenn Beck), think tank representatives (e.g., Joseph Bast and William O'Keefe), and politicians (e.g., Senator James Inhofe and Representative Joe Barton). Within the ranks of elites, climate change denialists are overwhelmingly conservative white males. Does a similar pattern exist in the American public?

A burgeoning body of literature on the social bases of climate change concern in the American public has emerged in recent years. Such studies have analyzed the direct effects of political ideology, race, and gender, typically finding that self-identified liberals<sup>2</sup> (Hamilton, 2008; McCright, 2010; Wood and Vedlitz,

<sup>1</sup> We believe that “denial,” “denialism,” and “denialist” are appropriate terms for the reasons spelled out by Dieltham and McKee (2009).

<sup>2</sup> Similarly, self-identified Democrats are more likely to express concern about global warming than are their Republican counterparts (Dunlap and McCright, 2008; Hamilton, 2011; Hamilton and Keim, 2009; Krosnick et al., 2000; McCright, 2010; McCright and Dunlap, 2011; Wood and Vedlitz, 2007).

\* Corresponding author. Tel.: +1 517 432 8026; fax: +1 517 432 2856.  
E-mail addresses: [mccright@msu.edu](mailto:mccright@msu.edu) (A.M. McCright), [rdunlap@okstate.edu](mailto:rdunlap@okstate.edu) (R.E. Dunlap).

2007), non-whites (Malka et al., 2009; McCright, 2010; McCright and Dunlap, 2011; Wood and Vedlitz, 2007), and females (Brody et al., 2008; Hamilton, 2008; Leiserowitz, 2006; Malka et al., 2009; McCright, 2010; McCright and Dunlap, 2011; O'Connor et al., 1999) are more likely to express concern about global warming than are their conservative, white, and male counterparts, respectively. The analysis presented below is the first to (a) consider the *intersection* of political ideology, race, and gender and (b) explicitly examine climate change denial.

Specifically, our research question is this: *Within the U.S. general public, are conservative white males more likely than other adults to espouse climate change denial?* In answering this question, we engage two bodies of scholarship. We draw upon a recent theoretical argument in the risk perception literature—the identity-protective cognition thesis (Kahan et al., 2007)—that explains the “white male” effect, or the atypically high levels of technological and environmental risk acceptance among white males. We also draw upon recent work in political psychology on the system-justification tendencies of political conservatives (Jost et al., 2008), which lead them to defend the status quo and resist attempts to change it. We believe the integration of these two arguments—the latter about conservatives and the former about white males—provide theoretical justification for what we call the “conservative white male” effect.

Examining such a conservative white male effect with regard to climate change denial may help account, at least part, for the USA's intransigence in international climate policy. In the process, we extend recent climate change public opinion studies, especially those focusing on the impacts of political orientation (e.g., Dunlap and McCright, 2008; Hamilton, 2008, 2011; Hamilton and Keim, 2009; Malka et al., 2009; McCright and Dunlap, 2011) and gender differences (e.g., Brody et al., 2008; Hamilton, 2008; McCright, 2010). We also extend the risk perception literature on the white male effect, by offering a sociopolitical explanation of the denial of climate change, one of the most serious risks facing humanity.

## 2. Theoretical rationale: the white male effect, identity-protective cognition, and system-justification tendencies

Past research on perceptions of technological and environmental risks in the US has documented what has been termed the white male effect, whereby white males are found to be more accepting of a wide range of risks than are other adults. This pattern has been found in nationally representative samples of the U.S. public (Finucane et al., 2000; Flynn et al., 1994; Kahan et al., 2007; Kalof et al., 2002; Satterfield et al., 2004), in convenience samples in particular U.S. localities, such as Philadelphia (Johnson, 2002) and Los Angeles (Palmer, 2003), and in random samples of rural areas along the Gulf Coast, such as in seven Louisiana parishes in “Cancer Alley” from Baton Rouge to New Orleans (Marshall, 2004) and in Mobile and Baldwin counties on the Alabama coast (Marshall et al., 2006). Further, the white male effect has been found with respect to perceptions of technological risks (Finucane et al., 2000; Flynn et al., 1994; Palmer, 2003; Satterfield et al., 2004), environmental problems (Finucane et al., 2000; Flynn et al., 1994; Johnson, 2002; Kahan et al., 2007; Kalof et al., 2002; Marshall, 2004; Marshall et al., 2006; Satterfield et al., 2004), and public health threats (Finucane et al., 2000; Flynn et al., 1994; Palmer, 2003). Thus, the white male effect appears to be quite robust.

The authors of these studies reject a biological explanation of this phenomenon. Rather, these scholars have put forth three

sociopolitical explanations: the vulnerability thesis,<sup>3</sup> the cultural worldviews thesis,<sup>4</sup> and the identity-protective cognition thesis. All three trace their origins to the suggestions made by Flynn et al. (1994) in their initial study. We draw theoretical and analytical guidance from the identity-protective cognition thesis, since it seems especially relevant for explaining the climate change denial of conservative white males.

In their initial study, Flynn et al. (1994) found that the white male effect was caused by a subgroup of white males who reported high levels of risk acceptance—30% of the white males in their national sample. This subgroup of risk-accepting white males had an affinity for hierarchy, had greater trust in authorities, and opposed democratization of risk management, leading the authors (1994, p. 1107) to emphasize the need to “move away from gender and toward sociopolitical explanations.” Near the end of their article, they (1994, p. 1107) suggested:

Perhaps white males see less risk in the world because they create, manage, control, and benefit from so much of it. Perhaps women and nonwhite men see the world as more dangerous because in many ways they are more vulnerable, because they benefit less from many of its technologies and institutions, and because they have less power and control.

Responding to the first sentence in the above quote, Kahan et al. (2007) craft the identity-protective cognition thesis, which integrates insights from cultural theory and work on motivated cognition in social psychology. The authors (2007, p. 467 [emphasis in original]) summarize their framework as follows:

We propose that variance in risk perceptions—across persons generally, and across race and gender in particular—reflects a form of *motivated cognition* through which people seek to deflect threats to identities they hold, and roles they occupy, by virtue of contested cultural norms. This proposition derives from the convergence of two sets of theories, one relating to the

<sup>3</sup> According to the vulnerability thesis, white males feel less vulnerable to many risks than do females and non-whites because of their dominant position in the social structure; they are, therefore, more accepting of such risks. Marshall et al. (2006, p. 35) point out that early works promoting the vulnerability thesis (e.g., Finucane et al., 2000; Kalof et al., 2002) used “race-gender group status” as “a surrogate measure of vulnerability.” That is, these studies used the socio-demographic characteristic of white male status as a proxy for individuals' social structural position in society. Satterfield et al. (2004) were the first to explicitly test the vulnerability thesis, employing a “social vulnerability score”—the mean of six discrimination items—in their analyses. They found some support for the hypothesis, as the independent effects of gender and race were partly but not fully explained by their vulnerability composite measure. “Gender remains a robust predictor of risk as does—to a lesser extent—race, but the influence of these two demographic variables (particularly race) is explained in part by our measures of vulnerability and environmental injustice” (Satterfield et al., 2004, p. 128). Marshall (2004) found a similar result when including an internal efficacy measure in his analytical models. This measure of vulnerability was the strongest predictor of environmental risk perceptions among Louisiana residents; yet, even when controlling for this variable, his “white male” dummy variable still had a statistically significant effect. In characterizing the generally supportive evidence for the vulnerability thesis, Marshall et al. (2006, p. 36) perhaps put it the best: “race-gender groups appear to serve as a significant but incomplete measure of vulnerability.”

<sup>4</sup> The cultural worldviews thesis has not yet been tested directly in studies of the white male effect. Nevertheless, scholars have documented the distinct political and cultural affinities of risk-accepting white males in ways that align with cultural theory of risk (e.g., Douglas and Wildavsky, 1982; Thompson et al., 1990; Wildavsky and Dake, 1990). For instance, risk-accepting white males are more likely than are others to have an individualist worldview (e.g., Finucane et al., 2000; Kahan et al., 2007; Palmer, 2003), be anti-egalitarian (e.g., Finucane et al., 2000; Flynn et al., 1994; Palmer, 2003; Satterfield et al., 2004), and favor hierarchy (e.g., Flynn et al., 1994; Kahan et al., 2007). Furthermore, Kahan et al. (2007) integrate cultural theory into their identity-protective cognition thesis, which we are employing.

impact of culture on risk perception and the other on the influence of group membership on cognition.

Drawing on cultural theory, Kahan et al. (2007) assert that individuals tend to form perceptions about risk that are shaped by their cultural worldviews (e.g., hierarchicalism, egalitarianism, individualism). Further, these authors also argue that individuals tend to adopt beliefs that are shared by members of salient in-groups, often resisting revision of such beliefs when they are confronted with contrary information from perceived out-groups. This reaction, which Kahan et al. (2007, p. 470) term “identity-protective cognition,” serves to protect the status and self-esteem that individuals receive from group membership: “as a means of identity self-defense, individuals appraise information in a manner that buttresses beliefs associated with belonging to particular groups.”

The authors (2007, p. 474 [emphasis in original]) argue that white males with a hierarchical cultural worldview would be the most likely to downplay or ignore environmental risks, perceiving them as challenges to the existing social, political, and economic hierarchy:

... to the extent that assertions of environmental risk are perceived as symbolizing a challenge to the prerogatives and competence of social and governmental elites, it is *hierarchical men*—and particularly *white* ones, insofar as minorities are more likely to be disproportionately egalitarian in their outlooks—whose identities are the most threatened, and who are thus most likely to form an extremely dismissive posture toward asserted risks.

Their multivariate analyses offer strong support for their identity-protective cognition hypothesis. In their models predicting perceptions of environmental risks, their dummy variable for white males with a hierarchical worldview accounted for all the gender and race variance: “this result confirms that the white male effect for environmental risks observed in the sample as a whole was, as hypothesized, attributable in its entirety to the extreme risk skepticism that hierarchical commitments induce in white males” (Kahan et al., 2007, p. 485).

Kahan et al. (2007, p. 491) demonstrate how the white male effect may be explained as a specific type of “motivated cognition aimed at protecting identities individuals form through their commitment to cultural norms.” Social group membership affects individuals’ information processing, since individuals are motivated by a strong emotional and psychic investment in having their group’s beliefs confirmed (2007, p. 470). We argue that a similar dynamic is at work with conservative white males and climate change denial, especially given recent insights from political psychology.

Research by Jost et al. (2008) finds that conservatives have much stronger system justification tendencies than do liberals—i.e. supporting maintenance of the societal status quo and resisting attempts to change it. Indeed, variation on system-justifying attitudes explains much, but not all, of the ideological difference between conservatives and liberals. Further, Feygina et al. (2010) more recently suggest that system justification is associated with the denial of problems, such as climate change, that threaten system functioning.

The initial study documenting the white male effect found that this phenomenon was due to a subsample of white males who reported high risk acceptance—30% of the white males in the national sample (Flynn et al., 1994). Indeed, the risk perceptions of the other white males in the sample differed little from those of other subgroups. Among other characteristics, Slovic (1999, p. 693) reports that the risk-accepting subgroup of white males was significantly more politically conservative than were others in the

national sample (see also Flynn et al., 1994; Satterfield et al., 2004). This justifies our specific focus on conservative white males.

Integrating the insights from identity-protective cognition and system-justification tendencies, we offer two complementary reasons for expecting conservative white males to be more likely than other adults to endorse climate change denial. On a specific level, conservative white male elites in the conservative movement and the fossil fuels industry have sent a consistent message—via conservative talk radio, television news, newspapers, and websites—to the American public for approximately twenty years: climate change is not real and thus does not warrant ameliorative action (e.g., Lahsen, 2008; McCright and Dunlap, 2000, 2003, 2010; Oreskes and Conway, 2010). This message, which is unmistakably associated with conservative political and media elites (Wolcott, 2007) and fossil fuels industry officials (Gelbspan, 1997), is remarkable for its constancy over the years and its sharp divergence from the claims emanating from the scientific community. To the extent that conservative white males in the general public view their brethren within the elite sectors as an in-group, then we expect that the former also will tend to reject the global warming claims of the scientific community, the environmental movement, and environmental policy-makers. In short, they will espouse climate change denial to defend the information disseminated within their in-group and to protect their cultural identity as conservative white males.

More generally, conservative white males are likely to favor protection of the current industrial capitalist order which has historically served them well. Fiscally conservative white males have disproportionately occupied positions of power within our economic system, controlling stocks and flows of various forms of capital and benefiting from ample amounts of prestige, status, and esteem (e.g., Massey, 2007). Given the expansive challenge that climate change poses to the industrial capitalist economic system, it makes sense that conservative white males’ strong system-justifying attitudes—triggered by the anti-climate science claims of the conservative movement (McCright and Dunlap, 2010)—may drive them toward climate change denial.

The parallel dynamics of identity-protective cognition and system-justifying attitudes also suggest that heightened emotional and psychic investment in defending in-group claims may translate into misperceived understanding about problems like climate change that threaten the continued order of the system. In the context of this study, we thus expect a positive association between conservative white males’ self-reported understanding of global warming and their climate change denial. Further, we expect that the subgroup of conservative white males who self-report understanding global warming very well (which we will term “confident” conservative white males) will be even more likely than other conservative white males who self-report understanding global warming less than very well to espouse climate change denial.

### 3. The study

Our data come from the Gallup Organization’s annual environment poll, conducted each March in anticipation of Earth Day (April 22). The ten Gallup surveys covering 2001–2010 are based on telephone interviews with nationally representative samples of adults (age 18 years or older), ranging from 1000 to 1060, in the United States. For our multivariate statistical analyses, we combined the available data into pooled samples.<sup>5</sup> The March

<sup>5</sup> Not all of the global warming items we employ were asked every year. Thus, when we use pooled samples in our analyses, the Ns vary across the dependent variables. Also, as typical for most national surveys, the Gallup Organization employs weighting procedures to ensure that its samples are representative of the American adult population. We report the results of multivariate models with unweighted data here.

**Table 1**  
Coding, mean, and standard deviation for variables in the study.<sup>a</sup>

| Variable  | Coding  | Mean  | SD    |
|---|---|-------|-------|
| Timing of global warming <sup>b</sup>               | 0 (all else) to 1 (will never happen)                                 | .11   | .31   |
| Primary cause of global warming <sup>c</sup>        | 0 (all else) to 1 (not primarily due to human activities)             | .42   | .49   |
| Scientific consensus on global warming <sup>d</sup> | 0 (all else) to 1 (no scientific consensus)                           | .39   | .49   |
| Seriousness of global warming <sup>b</sup>          | 0 (all else) to 1 (generally exaggerated in the news)                 | .35   | .48   |
| Worry about global warming <sup>f</sup>             | 0 (all else) to 1 (not at all)  | .18   | .39   |
| Political ideology <sup>b</sup>                     | 1 (very conservative) to 5 (very liberal)                             | 2.80  | .98   |
| Race <sup>b</sup>                                   | 0 (white) to 1 (non-white)  | .17   | .37   |
| Gender <sup>b</sup>                                 | 0 (male) to 1 (female)  | .52   | .50   |
| Conservative white male <sup>b</sup>                | 0 (no) to 1 (yes)   | .17   | .38   |
| Self-reported understanding <sup>e</sup>            | 1 (not at all) to 4 (very well)                                       | 2.87  | .77   |
| Confident conservative white male <sup>e</sup>      | 0 (no) to 1 (yes)   | .05   | .22   |
| Age <sup>b</sup>                                    | 18–99 (number in actual years)  | 47.06 | 17.40 |
| Educational attainment <sup>b</sup>                 | 1 (high school graduate or less) to 4 (more than college graduate)    | 2.05  | 1.06  |
| Annual income <sup>b</sup>                          | 1 (less than 20k) to 5 (more than 75k)                                | 3.26  | 1.37  |
| Full-time employment <sup>b</sup>                   | 0 (no) to 1 (yes)   | .50   | .50   |
| Parenthood <sup>b</sup>                             | 0 (no) to 1 (yes)   | .36   | .48   |
| Religiosity <sup>b</sup>                            | 1 (never attend church) to 5 (attend church once a week)              | 3.08  | 1.52  |
| Environmental movement identity <sup>e</sup>        | 1 (unsympathetic) to 4 (active participant in environmental movement) | 2.77  | .80   |
| Party identification <sup>b</sup>                   | 1 (Republican) to 5 (Democrat)  | 3.08  | 1.67  |
| Year <sup>b</sup>                                   | 1 (2001) to 10 (2010)   | 5.48  | 2.89  |

<sup>a</sup> Data is weighted.<sup>b</sup> Data for 2001–2010.<sup>c</sup> Data for 2001, 2003, 2006–2008, 2010.<sup>d</sup> Data for 2001, 2006, 2008, 2010.<sup>e</sup> Data for 2001–2008, 2010.<sup>f</sup> Data for 2001–2004, 2006–2010.

2001 survey was the first to include the key variables employed in this study. Also, 2001 saw the publication of the IPCC's (2001) *Third Assessment Report* and the National Research Council's (2001) *Climate Change Science*. Both reported the scientific consensus that global warming has already begun, that human activities are a significant contributor to global warming, and that mean global temperature will increase between 1.4 and 5.8 °C by 2100.

Table 1 provides the description, coding, mean, and standard deviation for each of the variables we use in the analyses. We employ five dichotomous indicators of climate change denial. In each case, a higher value represents a denial view. Two variables measure *beliefs about climate science*: timing of global warming (coded 1 for “will never happen”)<sup>6</sup> and primary cause of global warming (coded 1 for “not primarily due to human activities”).<sup>7</sup> Another variable measures a *belief about the scientific community*: scientific consensus on global warming (coded 1 for “no scientific consensus”).<sup>8</sup> Two more variables measure *personal concern about global warming*: seriousness of global warming (coded 1 for “generally exaggerated in the news”)<sup>9</sup> and worry about global warming (coded 1 for “not at all”).<sup>10</sup>

<sup>6</sup> Gallup's question: “Which of the following statements reflects your view of when the effects of global warming will begin to happen—they have already begun to happen, they will start happening within a few years, they will start happening within your lifetime, they will not happen within your lifetime, but they will affect future generations, (or) they will never happen?”

<sup>7</sup> Gallup's question: “And from what you have heard or read, do you believe increases in the Earth's temperature over the last century are due more to—the effects of pollution from human activities OR natural changes in the environment that are not due to human activities?”

<sup>8</sup> Gallup's question: “Just your impression, which one of the following statements do you think is most accurate—most scientists believe that global warming is occurring, most scientists believe that global warming is not occurring, or most scientists are unsure about whether global warming is occurring or not?”

<sup>9</sup> Gallup's question: “Thinking about what is said in the news, in your view is the seriousness of global warming generally exaggerated, generally correct, or is it generally underestimated?”

<sup>10</sup> Gallup's question: “I'm going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about . . . [in a list of 8–10 environmental problems] . . . the greenhouse effect or global warming?”

We measure political ideology (very conservative, conservative, middle of the road, liberal, very liberal) using a five-point scale, with smaller numerals denoting a conservative orientation and larger ones a liberal orientation. Race is coded 0 for whites and 1 for non-whites, and gender is coded 0 for males and 1 for females. We utilize a dummy variable for conservative white males, to examine the direct effects of this subgroup status while accounting for the direct effects of political ideology, race, and gender individually. In selected analyses, we also utilize a simple measure of self-reported understanding<sup>11</sup> of global warming that asks respondents to assess how well they understand the issue of global warming (“not at all” = 1 to “very well” = 4).<sup>12</sup> Combining the conservative white male dummy variable and the self-reported understanding indicator, we create a “confident” conservative white male dummy variable to identify those conservative white males who self-report understanding global warming “very well.” These confident conservative white males are 30.4% of all conservative white males in the pooled sample.

We also employ eight variables as statistical controls, coded as shown in Table 1. We draw this group of variables from those that have been used as controls in previous studies of the white male effect. Briefly, we control for the effects of the following in our multivariate regression models: age (Flynn et al., 1994; Finucane et al., 2000; Palmer, 2003; Satterfield et al., 2004; Marshall, 2004; Marshall et al., 2006; Kahan et al., 2007); educational attainment (Flynn et al., 1994; Finucane et al., 2000; Palmer, 2003; Satterfield et al., 2004; Marshall, 2004; Marshall et al., 2006; Kahan et al., 2007); annual income (Flynn et al., 1994; Finucane et al., 2000; Satterfield et al., 2004; Marshall, 2004; Kahan et al., 2007); full-time employment (Marshall, 2004); parenthood (Flynn et al., 1994; Marshall, 2004); religiosity (Satterfield et al., 2004); environmental movement identity (Marshall et al., 2006); and party

<sup>11</sup> Past research finds such self-assessments to be associated with objective measures of knowledge (Pierce et al., 1989).

<sup>12</sup> Gallup's question: “Thinking about the issue of global warming, sometimes called the ‘greenhouse effect,’ how well do you feel you understand this issue—would you say very well, fairly well, not very well, or not at all?”

**Table 2**  
Percents reporting selected climate change views.

| Climate change view  | Total (N)      | Conservative white males (N) | All other adults (N) | $\gamma^a$ |
|--|----------------|------------------------------|----------------------|------------|
| <i>Denial belief</i>   |                |                              |                      |            |
| The effects of GW will never happen                                    | 11.6% (10,125) | 29.6% (1910)                 | 7.4% (8215)          | .68***     |
| Recent temperature increases are not primarily due to human activities | 36.5% (6098)   | 58.5% (1131)                 | 31.5% (4967)         | .51***     |
| There is no scientific consensus that GW is occurring <sup>b</sup>     | 39.8% (4086)   | 58.8% (758)                  | 35.5% (3328)         | .44***     |
| Seriousness of GW is generally exaggerated in the media                | 36.5% (10,125) | 65.1% (1910)                 | 29.9% (8215)         | .63***     |
| Does not worry about GW at all   | 19.0% (9121)   | 39.1% (1707)                 | 14.4% (7414)         | .58***     |
| <i>Perceived understanding</i>   |                |                              |                      |            |
| Understand GW very well  | 20.3% (9113)   | 30.4% (1700)                 | 18.0% (7413)         | .28***     |

| Climate change view  | Total (N)    | Confident conservative white males <sup>c</sup> (N) | All other adults (N) | $\gamma^d$ |
|--|--------------|---|----------------------|------------|
| <i>Denial belief</i>   |              |   |                      |            |
| The effects of GW will never happen                                    | 10.9% (9113) | 48.4% (516)   | 8.6% (8597)          | .82***     |
| Recent temperature increases are not primarily due to human activities | 36.5% (6098) | 71.6% (377)   | 34.2% (5721)         | .66***     |
| There is no scientific consensus that GW is occurring <sup>b</sup>     | 39.8% (4086) | 70.7% (266)   | 37.7% (3820)         | .60***     |
| Seriousness of GW is generally exaggerated in the media                | 35.6% (9113) | 74.2% (516)   | 33.3% (8597)         | .70***     |
| Does not worry about GW at all   | 18.6% (8109) | 57.2% (472)   | 16.2% (7637)         | .75***     |

<sup>a</sup> Gamma for the relationship between the conservative white male dummy variable and the denial belief variable.  
<sup>b</sup> “Most scientists are unsure that GW is occurring” or “Most scientists believe that GW is not occurring”.  
<sup>c</sup> Conservative white males who self-report understanding global warming very well.  
<sup>d</sup> Gamma for the relationship between the confident conservative white male dummy variable and the denial belief variable.  
\*\*\*  $p < .001$  (two-tailed test).

identification (Kahan et al., 2007). Also, the survey year is measured as “2001” = 1 to “2010” = 10.

We begin by presenting some descriptive statistics to examine the extent of climate change denial among conservative white males, confident conservative white males, and all other adults in the U.S. public. We then examine simple correlations between self-reported understanding and climate change denial among conservative white males and all other adults. Finally, we run a series of multivariate logistic regression models to investigate the effect of conservative white male status, and confident conservative white male status, on our five indicators of climate change denial. This allows us to establish more rigorously the existence of a conservative white male effect vis-à-vis climate change denial.

**4. Results and discussion**

The top half of Table 2 reports the percents of conservative white males and all other adults espousing climate change denial views for each of our five indicators. Across the five items, significantly greater percentages of conservative white males than of all other American adults report denialist views. For instance, while 29.6% of conservative white males believe that the effects of global warming will never happen, only 7.4% of all other adults believe so. Also, 58.5% of conservative white males but only 31.5% of all other adults deny that recent temperature increases are primarily caused by human activities. The pattern for these first two items demonstrates that conservative white males are more likely than other adults to reject the scientific consensus on climate change—stated as early as the IPCC’s (2001) *Third Assessment Report* and the NRC’s (2001) *Climate Change Science*. Not surprisingly then, the pattern for the third item indicates that conservative white males are more likely than other adults to deny the existence of a scientific consensus (58.8% and 35.5%, respectively). Further, slightly more than twice as many conservative white males (65.1%) than all other adults (29.9%) believe that the seriousness of global warming is generally exaggerated in the media. Finally, 39.1% of conservative white males but only 14.4% of all other adults do not worry at all about global warming.

The Gamma values for the relationship between the conservative white male dummy variable and each of the five climate change denial indicators are moderately to very strong—ranging from .44 to .68 and significant at  $p < .001$ . This is initial, but compelling, evidence that within the American public conservative

white males have a strong tendency to endorse climate change denial.<sup>13</sup>

The bottom row in the top half of Table 2 shows that a greater percentage of conservative white males (30.4%) than of all other adults (18.0%) report that they understand global warming very well. The relatively modest Gamma value (.28) for the relationship between the conservative white male dummy variable and the full self-reported understanding variable (“not at all” to “very well”) indicates that conservative white males tend to assert somewhat greater personal understanding of global warming than do other adults. This, of course, seems an untenable self-assessment, given that conservative white males are more likely than are other adults to reject the current scientific consensus. Yet, this pattern—where conservative white males are more confident in their knowledge of climate change than are other adults, even as their beliefs conflict with the scientific consensus—is consistent with our expectation that identity-protective cognition and system-justifying tendencies are especially strong within conservative white males. Such processes, we argue, lead them to reject information from out-groups (e.g., liberals and environmentalists) they see as threatening the economic system, and such tendencies provoke strong emotional and psychic investment, easily translating into (over-)confidence in beliefs.

To explore our assertion of an association between confidence and denial, we extended the analyses reported in the top part of Table 2. Our confident conservative white male dummy variable identifies those conservative white males who self-report understanding global warming very well. The baseline group for this variable includes not only all adults who are not conservative white males but also the conservative white males who self-report understanding global warming less than very well. We replicated our comparisons with this new dummy variable, and the results are reported in the bottom part of Table 2. Compared to their respective counterparts in the top part of Table 2, each of the Gamma values in the bottom part of the table are stronger. In other

<sup>13</sup> In their audience segmentation analysis of the American public’s views of global warming, Maibach et al. (2009) find that males, non-Hispanic whites, and political conservatives are each over-represented in their “doubtful” and “dismissive” segments. Although they do not report how the category “conservative white males” is distributed across these and their other four segments, nor what proportions of each of these segments is represented by conservative white males, their results for the three variables individually are suggestive of a conservative white male effect.

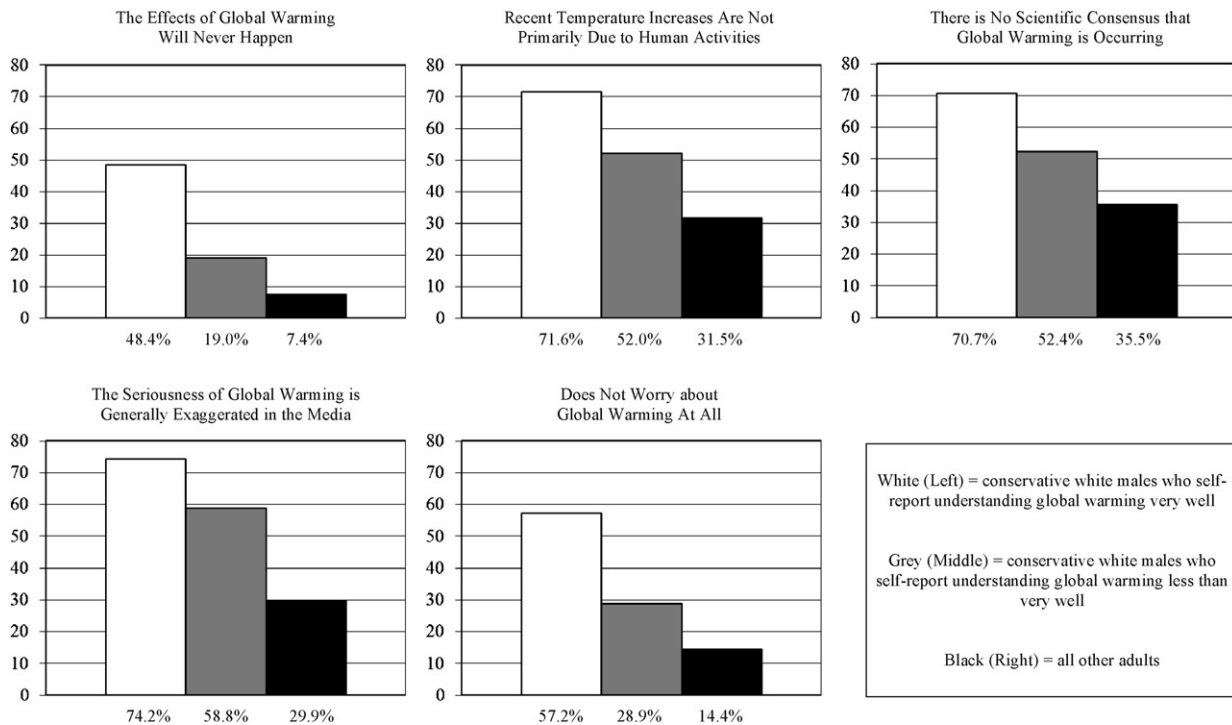


Fig. 1. Percents reporting selected climate change denial beliefs: confident conservative white males, other conservative white males, and all other adults.

Table 3  
 Correlations (Gammas) between self-reported understanding and climate change denial.

| Climate change denial view   | Conservative white males (N) | All other adults (N) |
|--|------------------------------|----------------------|
| The effects of GW will never happen                                    | .56*** (1700)                | .21*** (7413)        |
| Recent temperature increases are not primarily due to human activities | .37*** (1131)                | -.17*** (4967)       |
| There is no scientific consensus that GW is occurring                  | .32*** (758)                 | -.20*** (3328)       |
| Seriousness of GW is generally exaggerated in the media                | .32*** (1700)                | .00 (7413)           |
| Does not worry about GW at all   | .43*** (1497)                | -.06 (6612)          |

\*  $p < .05$  (two-tailed test).  
 \*\*\*  $p < .001$  (two-tailed test).

words, the relationship between conservative white male status and climate change denial is stronger among those who are most confident in their understanding of global warming.

Fig. 1 displays this pattern in a slightly different way. This figure shows the percentages—in the following three groups—that endorse each of our five climate change denial views: (1) conservative white males who self-report understanding global warming very well (our “confident” conservative white males); (2) conservative white males who self-report understanding global warming less than very well (“less confident” conservative white males); and (3) all other adults. Separating confident conservative white males from less confident conservative white males reveals a striking pattern. For instance, looking at the upper left quadrant we see that 48.4% of confident conservative white males believe the effects of global warming will never happen, while only 19.0% of the less confident conservative white males and only 7.4% of all other adults believe so.

For each of the five items, noticeably greater percentages of confident conservative white males than less confident conservative white males report a denialist view. We believe this suggests that identity-protective cognition and/or system-justifying tendencies are sufficiently strong among some conservative white males that such processes invoke heightened emotional and psychic investment in defending in-group claims, translating into

(mis)perceptions of knowledge about the problem that threatens the continued order of the system. To this end, we examine the correlation between self-reported understanding of global warming and each of the five denial indicators, for conservative white males and all other adults separately. Table 3 reports these results.

Among conservative white males, there is a positive correlation between self-reported understanding and climate change denial. The Gamma values range in strength from moderate (.32) to strong (.56). Among all other adults, however, we see a weaker positive correlation (.21) on the first denial item (the effects of global warming will never happen), no correlation on the fourth denial item (seriousness of global warming is generally exaggerated in the media), and negative correlations for the remaining three indicators. The positive correlations between self-reported understanding and climate change denial among conservative white males are consistent with expectations based upon identity-protective cognition and system-justification tendencies. Briefly, the latter expects a positive correlation between confidence in beliefs about a problem that threatens system order and denial of that very problem. This is especially the case as, with reference to identity-protective cognition, climate change denial seems to have become almost an essential component of conservative white male identity.

**Table 4**  
Logistic regression models predicting climate change denial in beliefs about climate science and the scientific community.

| Independent variables             | Global warming effects will never happen |                         |                                   | Human activities are not primary cause |                         |                                   | No scientific consensus that global warming is occurring |                         |                                   |
|-----------------------------------|--|-------------------------|-----------------------------------|--|-------------------------|-----------------------------------|--|-------------------------|-----------------------------------|
|                                   | Base                                     | Conservative white male | Confident conservative white male | Base                                   | Conservative white male | Confident conservative white male | Base   | Conservative white male | Confident conservative white male |
| Political ideology                | -.47***<br>(.05)                         | -.38***<br>(.07)        | -.33***<br>(.06)                  | -.36***<br>(.04)                       | -.31***<br>(.05)        | -.31***<br>(.04)                  | -.28***<br>(.05)   | -.20***<br>(.06)        | -.23***<br>(.05)                  |
| Race                              | -.07<br>(.14)                            | .06<br>(.15)            | .08<br>(.14)                      | .17<br>(.10)                           | .21*<br>(.10)           | .21*<br>(.10)                     | .30*<br>(.12)  | .38**<br>(.12)          | .34**<br>(.12)                    |
| Gender                            | -.67***<br>(.09)                         | -.46***<br>(.12)        | -.43***<br>(.09)                  | -.27***<br>(.07)                       | -.18*<br>(.08)          | -.18**<br>(.07)                   | -.23**<br>(.08)  | -.08<br>(.10)           | -.16<br>(.08)                     |
| Age                               | .00<br>(.00)                             | .00<br>(.00)            | .00<br>(.00)                      | .00<br>(.00)                           | .00<br>(.00)            | .00<br>(.00)                      | .01**<br>(.00)   | .01**<br>(.00)          | .01**<br>(.00)                    |
| Educational attainment            | .05<br>(.04)                             | .05<br>(.04)            | .03<br>(.04)                      | -.07<br>(.03)                          | -.07<br>(.03)           | -.08*<br>(.03)                    | -.13**<br>(.04)  | -.13**<br>(.04)         | -.13**<br>(.04)                   |
| Annual income                     | .07<br>(.04)                             | .07<br>(.04)            | .07<br>(.04)                      | .01<br>(.03)                           | .01<br>(.03)            | .01<br>(.03)                      | -.02<br>(.04)  | -.02<br>(.04)           | -.02<br>(.04)                     |
| Full-time employment              | .12<br>(.10)                             | .11<br>(.10)            | .11<br>(.10)                      | -.08<br>(.07)                          | -.09<br>(.07)           | -.08<br>(.07)                     | -.01<br>(.09)  | -.01<br>(.09)           | -.01<br>(.09)                     |
| Parenthood                        | -.02<br>(.10)                            | -.02<br>(.10)           | -.03<br>(.10)                     | .07<br>(.08)                           | .07<br>(.08)            | .07<br>(.08)                      | -.10<br>(.10)  | -.10<br>(.10)           | -.10<br>(.10)                     |
| Religiosity                       | .13***<br>(.03)                          | .13***<br>(.03)         | .14***<br>(.03)                   | .11***<br>(.02)                        | .11***<br>(.02)         | .11***<br>(.02)                   | .06*<br>(.03)  | .06*<br>(.03)           | .06*<br>(.03)                     |
| Environmental movement identity   | -.81***<br>(.05)                         | -.81***<br>(.05)        | -.81***<br>(.05)                  | -.60***<br>(.04)                       | -.60***<br>(.04)        | -.60***<br>(.04)                  | -.45***<br>(.05)   | -.45***<br>(.05)        | -.45***<br>(.05)                  |
| Party identification              | -.37***<br>(.03)                         | -.37***<br>(.03)        | -.37***<br>(.03)                  | -.21***<br>(.02)                       | -.21***<br>(.02)        | -.21***<br>(.02)                  | -.17***<br>(.03)   | -.17***<br>(.03)        | -.17***<br>(.03)                  |
| Year                              | .11***<br>(.02)                          | .11***<br>(.02)         | .10***<br>(.02)                   | .07***<br>(.01)                        | .07***<br>(.01)         | .07***<br>(.01)                   | .03**<br>(.01)   | .03**<br>(.01)          | .03**<br>(.01)                    |
| Conservative white male           |  | .35*<br>(.14)           |                                   |  | .25*<br>(.11)           |                                   |  | .41**<br>(.14)          |                                   |
| Confident conservative white male |  |                         | 1.22***<br>(.13)                  |  |                         | .80***<br>(.15)                   |  |                         | .64**<br>(.18)                    |
| Constant                          | .85**<br>(.30)                           | .41<br>(.34)            | .30<br>(.31)                      | 1.95***<br>(.24)                       | 1.71***<br>(.26)        | 1.71***<br>(.24)                  | 1.76***<br>(.29)   | 1.38***<br>(.32)        | 1.55***<br>(.30)                  |
| -2 Log likelihood                 | 4267.83                                  | 4260.93                 | 4180.11                           | 5782.79                                | 5777.88                 | 5752.46                           | 3764.24  | 3755.13                 | 3751.25                           |
| Nagelkerke R <sup>2</sup>         | .30                                      | .30                     | .32                               | .22                                    | .22                     | .23                               | .16  | .17                     | .17                               |
| Sample size                       | 8101                                     | 8101                    | 8101                              | 5086                                   | 5086                    | 5086                              | 3074   | 3074                    | 3074                              |

Note: Standard errors in parentheses.

\*  $p < .05$  (two-tailed test).

\*\*  $p < .01$  (two-tailed test).

\*\*\*  $p < .001$  (two-tailed test).

We now turn to Tables 4 and 5, which report the results of fifteen multivariate logistic regression models examining the effects of key variables on our indicators of climate change denial—the three belief items in Table 4 and the two concern items in Table 5. For each denial item, we report three models: (1) a base model examining the direct effects of political ideology, race, and gender, while controlling for the effects of nine other relevant social, demographic, political, and temporal variables; (2) an expanded model which adds our conservative white male dummy variable to the base model; and (3) an expanded model which adds our confident conservative white male dummy variable to the base model. We first examine the performance of our political ideology, race, and gender variables in the base model for each of our five climate change denial indicators, before discussing the performance of our conservative white male and confident conservative white male dummy variables in the expanded models for each denial item.

As shown in the base model for each of the five denial indicators, political conservatives and males are more likely to report a climate change denial view than are their politically liberal and female counterparts. This is consistent with the findings of existing climate change public opinion studies that self-identified liberals (Hamilton, 2008; McCright, 2010; McCright and Dunlap, 2011; Wood and Vedlitz, 2007) and females (Brody et al., 2008; Hamilton, 2008; Leiserowitz, 2006; Malka et al., 2009; McCright,

2010; McCright and Dunlap, 2011; O'Connor et al., 1999) are more likely to express concern about global warming than are their conservative and male counterparts. Past research finds race to be a weaker and less consistent indicator of climate change concern, though several studies report that non-whites express more concern than do whites (e.g., Malka et al., 2009; McCright, 2010; McCright and Dunlap, 2011; Wood and Vedlitz, 2007). Our results here indicate that non-whites are more likely than are whites to deny that a scientific consensus exists and that whites are more likely than are non-whites to believe that the media exaggerates the seriousness of global warming. Race has no direct effect on the other three denial indicators.

In the conservative white male model for each of the five climate change denial indicators in Tables 4 and 5, the statistically significant positive coefficient for our conservative white male dummy variable means that conservative white males are more likely to espouse climate change denial than are other adults. This effect exists when controlling for the separate, direct effects of political ideology, race, and gender—and for the effects of nine other relevant social, demographic, political, and temporal variables. In other words, the intersection of “conservative,” “white,” and “male” does matter for explaining the distribution of climate change denial in the American public. To answer our research question, what is observed anecdotally about climate change denialists being overwhelmingly conservative white males

**Table 5**  
Logistic regression models predicting climate change denial in concern about global warming.

| Independent variables             | Media exaggerates seriousness of global warming |                         |                                   | No worry at all about global warming |                         |                                   |
|-----------------------------------|---|-------------------------|-----------------------------------|--------------------------------------|-------------------------|-----------------------------------|
|                                   | Base  | Conservative white male | Confident conservative white male | Base                                 | Conservative white male | Confident conservative white male |
| Political ideology                | -.38***<br>(.03)                                | -.33***<br>(.04)        | -.35***<br>(.04)                  | -.36***<br>(.04)                     | -.28***<br>(.05)        | -.26***<br>(.05)                  |
| Race                              | -.38***<br>(.09)                                | -.33***<br>(.09)        | -.35***<br>(.09)                  | -.01<br>(.11)                        | .07<br>(.11)            | .07<br>(.11)                      |
| Gender                            | -.48***<br>(.06)                                | -.39***<br>(.07)        | -.42***<br>(.06)                  | -.42***<br>(.07)                     | -.26**<br>(.09)         | -.25***<br>(.08)                  |
| Age                               | -.00<br>(.00)                                   | -.00<br>(.00)           | -.00<br>(.00)                     | .00<br>(.00)                         | .00<br>(.00)            | .00<br>(.00)                      |
| Educational attainment            | .06*<br>(.03)                                   | .06*<br>(.02)           | .05<br>(.03)                      | .02<br>(.03)                         | .02<br>(.03)            | .00<br>(.03)                      |
| Annual income                     | .09***<br>(.02)                                 | .09***<br>(.02)         | .09***<br>(.02)                   | -.04<br>(.03)                        | -.04<br>(.03)           | -.04<br>(.03)                     |
| Full-time employment              | .08<br>(.06)                                    | .08<br>(.06)            | .08<br>(.06)                      | -.02<br>(.08)                        | -.03<br>(.08)           | -.03<br>(.08)                     |
| Parenthood                        | -.02<br>(.06)                                   | -.02<br>(.06)           | -.03<br>(.06)                     | -.00<br>(.08)                        | -.00<br>(.08)           | -.01<br>(.08)                     |
| Religiosity                       | .08***<br>(.02)                                 | .08***<br>(.02)         | .08***<br>(.02)                   | .10***<br>(.02)                      | .10***<br>(.02)         | .11***<br>(.02)                   |
| Environmental movement identity   | -.66***<br>(.04)                                | -.66***<br>(.04)        | -.66***<br>(.04)                  | -.74***<br>(.04)                     | -.741***<br>(.04)       | -.74***<br>(.04)                  |
| Party identification              | -.34***<br>(.02)                                | -.34***<br>(.02)        | -.33***<br>(.02)                  | -.29***<br>(.02)                     | -.29***<br>(.02)        | -.29***<br>(.03)                  |
| Year                              | .09***<br>(.01)                                 | .09***<br>(.01)         | .09***<br>(.01)                   | .09***<br>(.01)                      | .09***<br>(.01)         | .08***<br>(.01)                   |
| Conservative white male           |   | .23*<br>(.09)           |                                   |                                      | .31***<br>(.11)         |                                   |
| Confident conservative white male |   |                         | .54***<br>(.13)                   |                                      |                         | 1.10***<br>(.13)                  |
| Constant                          | 2.37***<br>(.20)                                | 2.15***<br>(.22)        | 2.23***<br>(.20)                  | 1.47***<br>(.25)                     | 1.14***<br>(.28)        | 1.09***<br>(.26)                  |
| -2 Log likelihood                 | 8502.35   | 8496.18                 | 8484.31                           | 5627.04                              | 5619.38                 | 5553.54                           |
| Nagelkerke R <sup>2</sup>         | .31   | .31                     | .31                               | .25                                  | .25                     | .27                               |
| Sample size                       | 8101  | 8101                    | 8101                              | 7097                                 | 7097                    | 7097                              |

Note: Standard errors in parentheses.

- \*  $p < .05$  (two-tailed test).
- \*\*  $p < .01$  (two-tailed test).
- \*\*\*  $p < .001$  (two-tailed test).

among elites is replicated to a considerable degree among the American public. Conservative white males are significantly more likely than are other adults to report climate change denial.

The third model for each denial indicator shows that confident conservative white males are even more likely to espouse climate change denial than are all other adults (a category that includes conservative white males who self-report understanding global warming less than very well). To compare the effect of the confident conservative white male dummy variable to the effect of the conservative white male dummy variable (which includes all conservative white males, regardless of their confidence levels), we present relevant model fit tests and odds ratios in Table 6.

The results of the likelihood ratio tests (1 *df*,  $\chi^2$  distribution) in Table 6 indicate that the confident conservative white male dummy variable improves model fit more than does the conservative white male dummy variable. Further, for each denial indicator, the odds ratio for the confident conservative white male dummy variable is greater than the one for the conservative white male dummy variable. For example, while conservative white males are 1.43 times more likely than other adults to believe the effects of global warming will never happen, confident conservative white males are 3.39 times more likely than other adults to do so. Thus, confident conservative white males are *much* more likely than are other adults to report climate change denial. Building

**Table 6**  
Model comparison statistics and odds ratios from logistic regression models: conservative white male versus confident conservative white male.

|  | Likelihood ratio test <sup>a</sup> |                                   | Odds ratio <sup>b</sup> |                                   |
|--|------------------------------------|-----------------------------------|-------------------------|-----------------------------------|
|  | Conservative white male            | Confident conservative white male | Conservative white male | Confident conservative white male |
| The effects of GW will never happen                                    | 6.90                               | 87.72                             | 1.43                    | 3.39                              |
| Recent temperature increases are not primarily due to human activities | 4.91                               | 30.33                             | 1.28                    | 2.23                              |
| There is no scientific consensus that GW is occurring                  | 9.11                               | 12.99                             | 1.51                    | 1.89                              |
| Seriousness of GW is generally exaggerated in the media                | 6.17                               | 18.04                             | 1.26                    | 1.71                              |
| Does not worry about GW at all   | 7.66                               | 73.50                             | 1.37                    | 3.00                              |

<sup>a</sup> Comparison of conservative white male or confident conservative white male model to base model, based on a chi-square distribution.

<sup>b</sup> Exponentiated logistic regression coefficient of conservative white male dummy variable in conservative white male model or confident conservative white male dummy variable in confident conservative white male model.



upon the results presented in Table 3, the patterns revealed in Table 6 further suggest that climate change denial is a form of identity-protective cognition, reflecting a system-justifying tendency.

It is also important to note the effects of the other social, demographic, political, and temporal variables we employed as controls in our models. Age generally has no effect on climate change denial, but older adults are more likely than are younger adults to believe there is no scientific consensus. Lesser educated adults are more likely than are their more highly educated counterparts to believe human activities are not the primary cause of recent warming and that there is no scientific consensus. Adults with higher socioeconomic status (both educational attainment and annual income) are more likely than are their lower SES counterparts to believe the media exaggerates the seriousness of global warming. Employment status and parental status have no direct effect on climate change denial. For each of the five denial items, more religious individuals, people unsympathetic to the environmental movement, and self-identified Republicans are more likely to express climate change denial than are their respective counterparts. Finally, climate change denial has increased over the time period between 2001 and 2010.

## 5. Conclusion

Integrating insights from Kahan et al.'s (2007) identity-protective cognition thesis and Jost et al.'s (2008; Feygina et al., 2010) empirical work on the strong system justification tendencies of conservatives, we argued that conservative white males would be more likely than other adults in the US to express climate change denial views. Further, risk perception scholars have found that white males who report atypically low environmental risk perceptions are more conservative than are other adults (Slovic, 1999; see also Flynn et al., 1994; Satterfield et al., 2004). We offered two complementary reasons for a conservative white male effect with regard to climate change denial.

On one level, conservative white males in the general public likely perceive conservative white male elites to be their in-group. Over the last twenty years, conservative white male elites have challenged the reality of climate change via conservative talk radio, websites, television news, and newspapers (e.g., Wolcott, 2007). Thus, we argued that conservative white males in the general public would be more likely than other adults to embrace and defend the claims of conservative white male elites. This follows reasoning by Kahan et al. (2007, p. 467): "It is natural for individuals to adopt a posture of extreme skepticism, in particular when charges of societal danger are leveled at activities integral to social roles constructed by their cultural commitments."

On another level, the work of Jost et al. (2008; Feygina et al., 2010) shows that conservatives—and we would extend this to conservative white males—strongly display tendencies to justify and defend the current social and economic system. Conservatives dislike change and uncertainty and attempt to simplify complexity (Amodio et al., 2007). Further, conservative white males have disproportionately occupied positions of power within our economic system. Given the expansive challenge that climate change poses to the industrial capitalist economic system, it should not be surprising that conservative white males' strong system-justifying attitudes would be triggered to deny climate change.

We do find strong evidence for a conservative white male effect on climate change denialism, whereby conservative white males are more likely than are other adults to espouse climate change denial. Further, we find that those conservative white males who self-report understanding global warming very well—*confident* conservative white males—express an even greater degree of

climate change denial. The positive correlation between self-reported understanding of global warming and climate change denial among conservative white males is compelling evidence that climate change denial is a form of identity-protective cognition, reflecting a system-justifying tendency.

While we have documented that conservative white males contribute disproportionately to climate change denial in the U.S., our results indicate that denialism is sufficiently diffuse within the American public that it obviously cannot be attributed *solely* to conservative white males. Even controlling for the denialism of conservative white males (and even confident conservative white males), conservatives (and Republicans), males, more religious individuals, and those unsympathetic to the environmental movement are still more likely to report denialist beliefs than are their respective counterparts. Finally, what is most sobering, especially for the scientific community and climate change communicators, is that climate change denial has actually increased in the U.S. general public between 2001 and 2010 (Newport, 2010), although primarily due to a significant increase in the past two years which may prove abnormal in the long run (Leiserowitz et al., forthcoming).

Our results relate back to earlier work on the political mobilization of conservative elites and organizations in the US to challenge climate science and policy (e.g., Dunlap and McCright, 2010, 2011; Freudenburg et al., 2008; Lahsen, 2005, 2008; McCright, 2007; McCright and Dunlap, 2000, 2003, 2010; Oreskes and Conway, 2008; Oreskes et al., 2008). Conservative think tanks, conservative media, corporations, and industry associations (especially for the fossil fuels industry)—domains dominated by conservative white males—have spearheaded the attacks on climate science and policy from the late 1980s to the present. The results presented here show that conservative white males in the general public have become a very receptive audience for these efforts. When mobilized, these conservative white males may constitute a key vector of climate change denial in their own right via their online and offline social networks and through participation in various protest and campaigning events.

Since the mid-1990s, organized climate change denial has diffused from the US to other Anglo nations with established conservative think tanks that promote free-market conservatism and front groups promoting industry interests, most notably Great Britain, Canada, Australia, and New Zealand (e.g., Hamilton, 2010; Hoggan and Littlemore, 2009; Monbiot, 2007). This spread of climate change denial has been driven to a significant degree by key actors—and their resources, strategies, and tactics—in the U.S. climate change denial machine (e.g., Dunlap and McCright, 2011). Throughout these Anglo countries organized denial seems to be dominated by politically conservative white males (e.g., Hoggan and Littlemore, 2009; Washington and Cook, 2011), and this suggests that a similar conservative white male effect might be emerging in the general publics of these nations with regard to climate change denial. Clearly the extent to which the conservative white male effect on climate change denial exists outside the US is a topic deserving investigation.

## Acknowledgements

The authors thank the Gallup Organization for making the data available for analysis; Tom Dietz, Joane Nagel, and Paul Slovic for their comments on an earlier draft; and the editors and reviewers for their constructive feedback and insights.

## References

- Amodio, D.M., Jost, J.T., Master, S.L., Yee, C.M., 2007. Neurocognitive correlates of liberalism and conservatism. *Nature Neuroscience* 10, 1246–1247.

- Beck, U., 2010a. Climate for change, or how to create a green modernity? *Theory, Culture, and Society* 27, 254–266.
- Beck, U., 2010b. Remapping social inequalities in an age of climate change: for a cosmopolitan renewal of sociology. *Global Networks* 10, 165–181.
- Brody, S.D., Zahran, S., Vedlitz, A., Grover, H., 2008. Examining the relationship between physical vulnerability and public perceptions of global climate change in the United States. *Environment and Behavior* 41, 72–95.
- Dieltham, P., McKee, M., 2009. Denialism: what is it and how should scientists respond? *European Journal of Public Health* 19, 2–4.
- Douglas, M., Wildavsky, A., 1982. *Risk and Culture*. University of California Press, Berkeley, CA.
- Dunlap, R.E., McCright, A.M., 2008. A widening gap: Republican and Democratic views on climate change. *Environment* 50 (5), 26–35.
- Dunlap, R.E., McCright, A.M., 2010. Climate change denial: sources, actors, and strategies. In: Lever-Tracy, C. (Ed.), *The Routledge International Handbook of Climate Change and Society*. Routledge Press, New York, pp. 240–259.
- Dunlap, R.E., McCright, A.M., 2011. Organized climate change denial. In: Schlosberg, D., Dryzek, J., Norgaard, R. (Eds.), *Oxford Handbook of Climate Change and Society*. Oxford University Press, Cambridge, pp. 144–160.
- Feygina, I., Jost, J.T., Goldsmith, R.E., 2010. System justification, the denial of global warming, and the possibility of 'system-sanctioned change'. *Personality and Social Psychology Bulletin* 36, 326–338.
- Finucane, M.L., Slovic, P., Mertz, C.K., Flynn, J., Satterfield, T.A., 2000. Gender, race, and perceived risk: the 'white male' effect. *Health, Risk, & Society* 2 (2), 159–172.
- Flynn, J., Slovic, P., Mertz, C.K., 1994. Gender, race, and perception of environmental health risks. *Risk Analysis* 14, 1101–1108.
- Freudenburg, W.R., Gramling, R., Davidson, D.J., 2008. Scientific certainty argumentation methods (SCAMs). *Sociological Inquiry* 78, 2–38.
- Gelbspan, R., 1997. *The Heat is On*. Addison Wesley, Reading, MA.
- Giddens, A., 2009. *The Politics of Climate Change*. Polity Press, Cambridge.
- Hamilton, C., 2010. *Requiem for a Species*. Earthscan, London.
- Hamilton, L.C., 2008. Who cares about polar regions?: results from a survey of U.S. public opinion. *Arctic, Antarctic, and Alpine Research* 40, 671–678.
- Hamilton, L.C., 2011. Education, politics, and opinions about climate change: evidence for interaction effects. *Climatic Change* 104 (2), 231–242.
- Hamilton, L.C., Keim, B.D., 2009. Regional variation in perceptions about climate change. *International Journal of Climatology* 29, 2348–2352.
- Hoggan, J., Littlemore, R., 2009. *Climate Cover-up: The Crusade to Deny Global Warming*. Greystone Books, Vancouver, BC, Canada.
- Intergovernmental Panel on Climate Change, 2001. *IPCC Third Assessment Report*. IPCC, Geneva.
- Johnson, B.B., 2002. Gender and race in beliefs about outdoor air pollution. *Risk Analysis* 22, 725–738.
- Jost, J.T., Nosek, B.A., Gosling, S.D., 2008. Ideology: its resurgence in social, personality, and political psychology. *Perspectives on Psychological Science* 3 (2), 126–136.
- Kahan, D.M., Braman, D., Gastil, J., Slovic, P., Mertz, C.K., 2007. Culture and identity-protective cognition: explaining the white-male effect in risk perception. *Journal of Empirical Legal Studies* 4, 465–505.
- Kalof, L., Dietz, T., Guagnano, G.A., Stern, P.C., 2002. Race, gender, and environmentalism: the atypical values and beliefs of white men. *Race, Gender & Class* 9 (2), 112–130.
- Krosnick, J.A., Holbrook, A.L., Visser, P.S., 2000. The impact of the fall 1997 debate about global warming on American public opinion. *Public Understanding of Science* 9, 239–260.
- Lahsen, M., 2005. Technocracy, democracy, and U.S. climate politics. *Science, Technology & Human Values* 30, 137–169.
- Lahsen, M., 2008. Experiences of modernity in the greenhouse: a cultural analysis of a physicist 'trio' supporting the backlash against global warming. *Global Environmental Change* 18, 204–219.
- Layzer, J., 2007. Deep freeze. In: Kraft, M.E., Kamieniecki, S. (Eds.), *Business and Environmental Policy*. MIT Press, Cambridge, MA, pp. 93–125.
- Leiserowitz, A., 2006. Climate change risk perception and policy preferences: the role of affect, imagery, and values analysis. *Climatic Change* 77, 45–72.
- Leiserowitz, A., Maibach, E.W., Roser-Renouf, C., Smith, N., Dawson, E. Climategate, public opinion, and the loss of trust. *American Behavioral Scientist*, forthcoming.
- Maibach, E., Roser-Renouf, C., Leiserowitz, A., 2009. *Global Warming's Six Americas 2009: An Audience Segmentation Analysis*. Yale Project on Climate Change, Yale University and George Mason University, New Haven, CT.
- Malka, A., Krosnick, J.A., Langer, G., 2009. The association of knowledge with concern about global warming. *Risk Analysis* 29, 633–647.
- Marshall, B.K., 2004. Gender, race, and perceived environmental risk: the 'white male' effect in cancer alley, LA. *Sociological Spectrum* 24, 453–478.
- Marshall, B.K., Picou, J.S., Formichella, C., Nicholls, K., 2006. Environmental risk perceptions and the white male effect. *Journal of Applied Sociology* 23 (4), 31–49.
- Massey, D., 2007. *Categorically Unequal: The American Stratification System*. Russell Sage Foundation, New York.
- McCright, A.M., 2007. Dealing with climate change contrarians. In: Moser, S.C., Dilling, L. (Eds.), *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*. Cambridge University Press, New York, pp. 200–212.
- McCright, A.M., 2010. The effects of gender on climate change knowledge and concern in the American public. *Population and Environment* 32, 66–87.
- McCright, A.M., Dunlap, R.E., 2000. Challenging global warming as a social problem: an analysis of the conservative movement's counter claims. *Social Problems* 47 (4), 499–522.
- McCright, A.M., Dunlap, R.E., 2003. Defeating Kyoto: the conservative movement's impact on U.S. climate change policy. *Social Problems* 50 (3), 348–373.
- McCright, A.M., Dunlap, R.E., 2010. Anti-Reflexivity: the American conservative movement's success in undermining climate science and policy. *Theory, Culture, and Society* 27 (2–3), 100–133.
- McCright, A.M., Dunlap, R.E., 2011. The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly* 52, 155–194.
- Monbiot, G., 2007. *Heat*. South End Press, Cambridge, MA.
- National Research Council, 2001. *Climate Change Science*. National Academy Press, Washington, DC.
- Newport, F., 2010. Americans' global warming concern continues to drop. [Online] Available at: <http://www.gallup.com/poll/126560/Americans-Global-Warming-Concerns-Continue-Drop.aspx> (accessed 30.05.10).
- O'Connor, R.E., Bord, R.J., Fisher, A., 1999. Risk perceptions, general environmental beliefs, and willingness to address climate change. *Risk Analysis* 19 (3), 461–471.
- Oreskes, N., Conway, E.M., 2008. *Challenging knowledge: how climate science became a victim of the Cold War*. In: Proctor, R.N., Schiebinger, L. (Eds.), *Agnotology: The Making and Unmaking of Ignorance*. Stanford University Press, Stanford, CA, pp. 55–89.
- Oreskes, N., Conway, E.M., 2010. *Merchants of Doubt*. Bloomsbury Press, New York.
- Oreskes, N., Conway, E.M., Shindell, M., 2008. From chicken little to Dr. Pangloss. *Historical Studies in the Natural Sciences* 38, 109–152.
- Palmer, C.G.S., 2003. Risk perception: another look at the 'white male' effect. *Health, Risk, & Society* 5 (1), 71–83.
- Pierce, J.C., Lovrich, N.P., Tsurutani, T., Abe, T., 1989. *Public Knowledge and Environmental Politics in Japan and the United States*. Westview, Boulder.
- Satterfield, T.A., Mertz, C.K., Slovic, P., 2004. Discrimination, vulnerability, and justice in the face of risk. *Risk Analysis* 24, 115–129.
- Slovic, P., 1999. Trust, emotion, sex, politics, and science: surveying the risk-assessment battlefield. *Risk Analysis* 19 (4), 689–701.
- Thompson, M., Ellis, R., Wildavsky, A., 1990. *Cultural Theory*. Westview Press, Boulder, CO.
- Washington, H., Cook, J., 2011. *Climate Change Denial: Heads in the Sand*. Earthscan, Oxford, UK.
- Wildavsky, A., Dake, K., 1990. Theories of risk perception. *Daedalus* 119 (4), 41–60.
- Wolcott, J., 2007 May. Rush to judgment. *Vanity Fair* 100–106.
- Wood, B.D., Vedlitz, A., 2007. Issue definition, information processing, and the politics of global warming. *American Journal of Political Science* 51, 552–568.