American evangelicals and global warming

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A B S T R A C T

American evangelicals have long played a significant role in American culture and politics. Drawing from a nationally representative survey, this article describes American evangelicals’ global warming risk assessments and policy preferences and tests several theory-based factors hypothesized to influence their views. American evangelicals are less likely than non-evangelicals to believe that global warming is happening, caused mostly by human activities, and causing serious harm, yet a majority of evangelicals are concerned about climate change and support a range of climate change and energy related policies. Multiple regression analyses found that the combination of biospheric, altruistic, and egoistic value orientations is a more significant predictor of evangelicals’ risk assessments and policy support than negative affect, egalitarian or individualistic worldviews, or socio-demographic variables.

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1. Introduction

Christianity and modern environmentalism have often had a troubled relationship. In 1967, historian Lynn White argued that the Judeo-Christian worldview was a root cause of the Western world’s destructive relationship with nature. Specifically, he argued that the Old Testament book of Genesis had long been interpreted as giving humanity the right to dominate nature and exploit its resources for human use (White, 1967). His article sparked a heated controversy that continues to this day, including extended theological debates over whether “dominion” means domination or stewardship, and numerous research studies that have examined the relationship between religion, environmental concern, and behavior (Djupe and Hunt, 2009). The results of these investigations have been mixed. Several studies have found that some types of religious belief (e.g. conservative eschatology or ‘End of Times’ thinking) are associated with lower levels of environmental concern (Hand and Van Liere, 1984; Eckberg and Blocker, 1989; Guth et al., 1995). Others, however, have found that the belief in God or identification with particular religions is not or only weakly associated with measures of environmental concern (Boyd, 1999; Hayes and Marangudakis, 2000, 2001).

Yet other studies have found that individuals who attend church more often are more likely to engage in environmentally protective behavior (Kanagy and Willits, 1993; Woodrum and Wolkomir, 1997). Still other studies have found that biblical literalism is associated with greater concern about environmental impacts on humans, but less concern about environmental impacts on plants and animals (Schultz et al., 2000). Finally, some scholars argue that organized religions have fundamentally shaped human cultural and ethical values around the world (Kaplan, 2010). Faith communities thus have the unique ability to construct moral frameworks that can encourage human beings to protect the Earth (Tucker, 2003). Evangelicals are one such group. National surveys have found that between 25 and 30% of the American public consider themselves ‘born again’ or evangelical Christians (Pew, 2008; Gallup, 2005). Their political profile is mixed, although majorities identify with the Republican Party and have a conservative political ideology (Pew, 2008). In turn, evangelical organizations and opinion leaders have had a significant influence on American public discourse and government policies for many years (Wills, 1991; Kohut et al., 2000). Layman and Hussey (2007), for example, argue that evangelicals were of significant importance for the election and re-election of President George W. Bush. Often voting in large numbers, evangelicals have tended to support politically conservative candidates whose political beliefs (including pro death penalty, anti gun control, anti gay marriage, etc.) resonate with their own (Wilcox, 2000).

The present study explores how the American evangelical community engages with the issue of global warming. More specifically, how evangelicals perceive the risks of global warming,
whether they support or oppose climate change and energy policies, and what factors influence their views. Given the socio-political influence evangelicals have in contemporary American society, it is important to know how the community engages with global warming, particularly as the issue has become increasingly politicized in recent years (Dunlap and McCright, 2008).

American evangelicals have engaged a broad range of environmental issues for many years (Kearns, 1996, 1997; Shibley and Wiggins, 1997), but only recently have they turned their attention to global warming. A number of evangelical leaders have argued that anthropogenic climate change is a fundamental moral and ethical issue that must be addressed by people of faith. In 2002, a University of Oxford forum facilitated discussions among prominent climatologists and members of the US National Association of Evangelicals. This event, combined with subsequent meetings and discussions, led to the Evangelical Climate Initiative and its ‘Call to Action’ plan for dealing with the global warming challenge (ECI, 2006).

This ‘Call to Action’ outlines how evangelicals should engage with global warming. First and foremost is acceptance of the anthropogenic causes of global warming, followed by an acknowledgment that the consequences will be severe and will hit the poorest areas of the world the hardest (ECI, 2006). A campaign to engage the American evangelical community followed the publication of the Call to Action, and numerous advertisements appeared in major American newspapers urging efforts to combat the crisis. Using the tagline ‘Our commitment to Jesus Christ compels us to solve the global warming crisis’ these advertisements argued that evangelicals have a duty and responsibility to protect the planet. Other initiatives developed to promote environmental stewardship and evangelical engagement with global warming include The Evangelical Environmental Network, ‘Restoring Eden’ Christians for Environmental Stewardship, and the Youth Evangelical Climate Initiative.

This perceived sense of duty and responsibility to protect the planet draws directly from the moral conviction among some evangelicals that human beings are called to protect God’s creation (Kearns, 1997; Hayhoe and Farley, 2009; Moore and Nelson, 2010). They argue that not only do humans have a responsibility to look after the Earth, as they are dependent on its resources for survival, but that there is also a moral imperative to do what is right, as instructed by God. Often drawing upon a stewardship interpretation of the word “dominion” in the book of Genesis, these evangelicals argue that Christians have a moral responsibility to protect God’s creation (Kearns, 1997; Robinson, 2010).

Wilkinson (2010, 2012) and Warderkker et al. (2009) examined the moral narratives American evangelicals have used as they engage with the issue of global warming. They identified two key moral themes in evangelical thought and literature: ‘creation care’ and ‘neighbor care’. ‘Creation care’ emphasizes environmental stewardship and the responsibility humans have to look after God’s creation, while ‘neighbor care’ focuses on the importance of caring for one’s neighbor, especially the poor, sick, and vulnerable. Some evangelical leaders have drawn upon both of these biblical imperatives to develop their response to global warming, arguing that climate change is likely to have severe impacts on both humans and non-human nature, and especially on the world’s poor, who are often the most vulnerable to changes in the climate.

Recent qualitative research has also documented various ‘opinion drivers’ for how evangelicals understand global warming. Wilkinson (2010, 2012) asked respondents from nine evangelical churches in the southeastern United States to read the ECI’s ‘Call to Action’. Focus group discussions were then conducted to test their opinions in greater depth. She found that although tenets of the creation and neighbor care themes resonated with evangelical churchgoers, the topic of global warming also generated polarized views. More specifically, lay evangelicals in these focus groups tended to be much more skeptical of climate change science and the potential consequences than the leaders who had signed the ECI. This research also found that distrust of scientists and a conservative political ideology were important factors. These findings are in line with other research that demarcates evangelical beliefs along political lines. For example, McCamack (2007) describes the difference between liberal and conservative evangelical environmentalists. Liberal evangelicals broadly accept that global warming is occurring and accept a biblical mandate to take action to protect God’s creation, while conservative evangelicals doubt global warming science and support policies which protect the economy rather than the environment.

These prior studies, however, have been based either on limited qualitative data or analysis of key texts. But how do American evangelicals as a group perceive global warming? What policies do they support or oppose? To what extent do they accept the arguments being made by some evangelical leaders that climate change is a serious moral and religious issue? Very little survey research has investigated how evangelicals respond to this issue. A few results from public opinion polls have found that evangelicals are less likely than the national average to believe that global warming has an anthropogenic basis (Pew, 2009). Furthermore, evangelicals have also been found to be less likely to believe that the federal government should do more to mitigate the threat (Public Religion Research Institute, 2009). This paper describes American evangelicals’ global warming risk assessments and policy preferences, and tests several theoretically derived predictors of their views – the roles of affect, cultural worldviews and environmental value orientations.

1.1. Risk as analysis vs. risk as feeling: the importance of affect

How individuals understand and process risk information centers around two fundamental yet distinct approaches. The ‘risk as analysis’ paradigm emphasizes the use of cognitive deliberation and analytic processing of risk, whereas the ‘risk as feelings’ approach is experiential, arguing that people are often more reliant upon affect and emotion when making risk judgments and decisions (Slovic and Peters, 2006; Finucane, 2008). Treating response to risk as primarily cognitive, traditional risk perception and mental model studies have identified the various heuristics and biases individuals use to process and understand risk information. Knowledge, or rather the lack of knowledge, for example has been used to account for important misconceptions publics have about climate change, among other risk issues (Kempton, 1991; Bostrom et al., 1994; O’Connor et al., 1999).

More recent research has focused on the role of “affect”, or the emotional quality of ‘good’ or ‘bad’ associated with different risks (Slovic et al., 2002). This research has found that people draw upon both affect and emotional cues to process information and make decisions about risk. Affect is processed quickly, automatically, and efficiently and enables people to make daily decisions with relatively little cognitive effort. As such, affect helps to guide perceptions of risk and benefit. Individuals are often motivated to engage in activities that produce positive and pleasant feelings, but also to avoid activities that produce negative and unpleasant feelings. Empirical support for this ‘affective heuristic’ is growing and has been used to explore public risk perceptions for a range of issues (e.g. Finucane et al., 2000).

Researchers have also investigated the affective dimensions of public risk perceptions of global warming, using affective imagery analysis. “Imagery” here refers to mental representations or cognitive content within the individual mind and can include both perceptual and symbolic representations (Damasio, 1999). “Affective imagery” is therefore defined as “sights, sounds, smells, ideas,
and words, to which positive and negative affect or feeling states have become attached through learning and experience” (Slovic et al., 1998, p. 3).

Affective imagery analysis uses a structured form of word association in order to identify the mental representations and feelings people spontaneously associate with particular risks, hazards, or target terms (Szalay and Deese, 1978). Leiserowitz (2006), and more recently Smith and Leiserowitz (2012) for example, found a range of images for global warming including associations with melting ice, increases in heat and skepticism. Moreover these images were stronger predictors of global warming risk perceptions and policy preferences than a range of other sociodemographic and political variables. These, and other studies, provide evidence of the important role affect and affective imagery play in judgment and decision-making processes of risk issues.

1.2. Cultural theory

Cultural theory explores the role of underlying worldviews in public responses to risk (Douglas and Wildavsky, 1982; Douglas, 1992). Worldviews and their ‘orienting dispositions’ guide how the public process risk information (Dake, 1991, 1992; Dake and Wildavsky, 1990, 1991). According to the theory, “worldviews are mediated by social relations; an individual is either more group-oriented or individual-oriented. Likewise, an individual believes that many socially stratified rules are needed to control behavior, or that few rules are necessary” (Leiserowitz, 2006, p. 49).

Different combinations of these two dimensions result in a four-cell operationalization of cultural ‘worldviews’. These ideal types (hierarchists, egalitarians, individualists and fatalists) represent culturally biased ‘ways of life’ predisposing those located within each to view risk in a particular and predictable manner. Hazards tend to be seen as risky or not and policies supported or opposed depending on one’s worldview (Dake, 1991; Peters and Slovic, 1996). These are, however, only ideal types: “This typology is a heuristic device; few individuals should be expected to hold to these extreme positions consistently” (Jaeger et al., 1998, p. 191).

Hierarchists, for example, are group-oriented, prefer strong social rules, and tend to support policies as long as experts govern them. Egalitarians are also group-oriented, prefer fewer social rules, and support democratic and participatory decision making and policies designed to maximize fairness and equality for all. Individualists are individual-oriented, believe few rules are necessary to govern behavior, and typically oppose policies that restrict individual autonomy. Despite being criticized as a narrow and overly simplistic categorisation of risk (Boholm, 1996; Lupton, 1999) empirical research has repeatedly found that egalitarianism and individualism, in particular, are important predictors of public risk perceptions of various hazards, including global warming (Smith and Leiserowitz, 2012; Leiserowitz, 2006), water pollution (Langford et al., 2000), nuclear power (Slovic and Peters, 1998) and nanotechnology (Kahan et al., 2009).

1.3. Value-belief-norm theory

Adapting Schwartz’ norm-activation model of altruism (Schwartz, 1973; Schwartz and Howard, 1981), value-belief-norm theory offers an account of the values underlying environmental concern which helps guide attitudes and behaviors when individuals are faced with environmental risk (Stern et al., 1993; Stern and Dietz, 1994; Stern, 2000). The theory argues that environmental concern is comprised of three value orientations – egoistic, altruistic and biospheric – which influence how an individual responds to adverse consequences threatening objects they value. Individuals with an egoistic value orientation, for example, might take action or engage in pro-environmental behavior if they feel personally affected by risk whereas someone with an altruistic value orientation might, out of a moral sense of duty, be motivated to protect friends, family or others in their local community from risk. Individuals with a biospheric orientation are driven by the intrinsic value they place in nature and use this as motivation to protect against risk. Analogous to cultural worldviews, these value orientations predispose individuals to perceive and respond to environmental risk in different yet predictable ways. Research has shown biospheric, altruistic and egoistic values are important predictors of a range of issues including willingness to reduce personal car use (Nordlund and Garvill, 2003) and support for energy policies (Steg et al., 2005).

The present investigation explores American evangelicals’ responses to global warming and tests the relative ability of the affect heuristic, cultural theory, and value-belief-norm theory to predict evangelical global risk assessments and policy preferences, with the following research hypotheses:

1. Holistic affect and affective images significantly predict evangelicals’ global warming risk assessments and support for climate policies, with more negative affect correlated with greater risk assessments and policy support.

2. The cultural worldviews of egalitarianism and individualism have a significant and separate influence on evangelicals’ global warming risk assessments and support for climate policies, with egalitarianism correlated with greater risk assessments and policy support and individualism correlated with lower risk assessments and policy support.

3. Biospheric, altruistic and egoistic value orientations (environmental concern) have a significant and separate influence on evangelicals’ global warming risk assessments and support for climate policies.

2. Method

2.1. Respondents and procedure

A nationally representative survey of American public opinion, risk perceptions and policy preferences was conducted between September and November 2008 by Knowledge Networks using their nationally representative online research panel. A total sample of 2164 American adults completed the questionnaire with a within-panel completion rate of 54%. Due to length, the questionnaire was divided into two stages and data collection occurred over a two-week period. Data was weighted to match US Census Bureau population parameters and the margin of sampling error was plus or minus 2%, with 95% confidence. From a total sample of 2164 American adults in the survey, 584 (27%) identified themselves as ‘born again’ or evangelical, 1318 (62%) said they were not, and 230 (11%) said they did not know.

2.2. Measures

2.2.1. Risk assessment

Assessments of global warming risk were measured along three dimensions: (1) the spatial distance of the threat (how much respondents thought global warming would harm them personally, their family, their community, people in the US, people in other industrial countries, people in developing countries, future generations, and other plant and animal species); (2) the temporal distance of the threat (the timing of harm to people in the United States and people around the world); and (3) the likelihood of various impacts (including intense hurricanes, extinctions of plant and animal species, climate change refugees, and disease...
epidemics). Other studies using similar measures to assess global warming risk perception include (Leiserowitz, 2006; Akerlof et al., 2010; Smith and Leiserowitz, 2012; Ding et al., 2011). For analysis, a single risk assessment index integrating all three dimensions was constructed ($\alpha = 0.98$; see supplementary material for full questions).

2.2.2. Policy preferences

Respondents were also asked how much they supported or opposed a variety of climate change and energy policies. Policies, similar to those used in other studies (e.g. O’Connor et al., 1999; Leiserowitz, 2006), included support for the regulation of carbon dioxide as a pollutant, a 25-cent per gallon gasoline tax, funding research into renewable energy sources, and establishing a fund to make buildings more energy efficient. For analysis a policy support index was created based on the overall mean response for each policy item ($\alpha = 0.85$; see supplementary material for full questions).

2.2.3. Holistic affect

Holistic affect is often defined as a single, overarching positive or negative evaluation of a stimulus term (Finucane et al., 2003; Slovic and Peters, 2006; Leiserowitz, 2005, 2006). For the present study, respondents were asked to rate whether global warming is a good or a bad thing using a unipolar, 6-point Likert scale ranging from +3 (very good) and −3 (very bad).

2.2.4. Affective imagery

Affective images were collected from all respondents and contain two elements: a cognitive component (the image category) and associated affective rating (a goodness or badness evaluation). Images were collected using an open-ended word association methodology (Szalay and Deese, 1978; Peters and Slovic, 1996) that enables context free associations to emerge naturally in response to a stimulus term. Images were collected by asking respondents to provide the first ‘word’ or ‘phrase’ that comes to mind when thinking about global warming. Responses were typically in the form of single word associations (e.g. ‘apocalypse’) or short narrative statements (e.g. ‘the end of the world’). Respondents were asked to rate their own association on a 6-point affect scale (where +3 = a very good thing and −3 = a very bad thing). This procedure produced a rich dataset of images for each survey that were analyzed using a coding frame first developed and tested by the authors in 2002 (Leiserowitz, 2005) and replicated in several national surveys since. Ten percent of the images were double coded to ensure consistency of the coding and the inter-coder agreement was satisfactory (84%). Differences were resolved following discussion between the two coders. The mean affect of each image category was also calculated.

2.2.5. Global warming concern

Global warming concern was operationalized by adapting questions from the Environmental Concern Scale (Schultz, 2000, 2001). Traditionally, this scale contains a range of questions tapping three underlying dimensions of environmental concern (biospheric, altruistic & egoistic value orientations). For the present investigation, each question was modified to reflect levels of concern about global warming along these three dimensions. An exploratory factor analysis found that “global warming concern” was best described as a one-factor rather than a three-factor construct (see supplementary material for further details). For analysis, a global warming concern index was created with a very high reliability score ($\alpha = 0.99$; see supplementary material for full questions). Global warming concern and the risk assessment indices have a few similar items (see supplementary material for individual items) but measure different constructs: global warming concern measures an affective and emotional reaction to global warming impacts whereas risk assessment is a cognitive judgment of the likelihood, frequency and magnitude of global warming impacts.

2.2.6. Worldviews

The cultural worldviews of egalitarianism and individualism were operationalized using a series of questions derived from Cultural Theory and adapted from scales used by Dake (1991, 1992), Peters and Slovic (1996), Rippl (2002) and Leiserowitz (2006). For analysis, egalitarianism and individualism indices were created, each with a high reliability score (both $\alpha’s$ = 0.76; see supplementary material for full questions).

2.2.7. Socio-demographics

A range of socio-demographic information was also collected as control variables, including gender, age, ethnicity, educational attainment, household income, political ideology (liberal–conservative), political party identification (Democrat, Independent, Republican), and religiosity (frequency of religious service attendance).

3. Results

What is the difference between evangelical and non-evangelical global warming beliefs, attitudes, risk assessments and policy preferences?

3.1. Beliefs and attitudes

American evangelical beliefs and attitudes are presented in Table 1. Compared to non-evangelicals, American evangelicals are less likely to believe global warming is happening ($\chi^2 (1) = 63.55$, $p < .001$), less likely to believe human activity is the cause ($\chi^2 (1) = 64.77$, $p < .001$), less worried about global warming ($t(1012) = −8.48$, $p < .001$) and less likely to believe that most scientists think global warming is happening ($\chi^2 (1) = 32.22$.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Evangelicals</th>
<th>Non-evangelicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think global warming is happening?</td>
<td>Yes</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Do not know</td>
<td>24</td>
</tr>
<tr>
<td>Assuming global warming is happening, do you think it is ...</td>
<td>Caused mostly by human activities</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Caused by human activities and natural changes</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Caused mostly by natural changes in the environment</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Neither because global warming is not happening</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Do not know/other</td>
<td>4</td>
</tr>
<tr>
<td>Perceptions of scientific consensus</td>
<td>Most scientists think global warming is happening</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Most scientists think global warming is not happening</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>There is a lot of disagreement</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Do not know enough to say</td>
<td>20</td>
</tr>
<tr>
<td>How worried are you about global warming?</td>
<td>Very worried</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Somewhat worried</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Not very worried</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Not at all worried</td>
<td>22</td>
</tr>
</tbody>
</table>

p < .001). Despite these differences, however, 61% of evangelicals believe that global warming is happening, 44% believe that anthropogenic activities were to blame and 49% are either very worried or somewhat worried about the problem.

3.2. Risk assessments

American evangelical and non-evangelical risk assessments are presented in Fig. 1. Bars represent the proportions of each that believe global warming will harm each category of people or nature ‘a moderate amount’ or ‘a great deal’. Compared to non-evangelicals, evangelicals are less likely to believe that global warming will seriously harm non-human nature (t(1077) = −8.58, p < .001) future generations (t(1075) = −8.01, p < .001), people in developing countries (t(1890) = −6.87, p < .001), people in the USA (t(1086) = −6.46, p < .01), people in other modern industrialized countries (t(1893) = −5.57, p < .001) and their local community (t(1891) = −6.51, p < .05). Evangelicals are less likely than non-evangelicals to believe that global warming will seriously harm their family (t(1090) = −3.32, p < .001) or themselves personally (t(1896) = −4.93, p < .001).

Nearly half of American evangelicals, however, assess global warming as a threat to non-human nature and future generations of people. Forty-seven percent said that global warming will harm non-human nature and 46% said it will harm future generations of people “a moderate amount” or “a great deal.” Global warming was less likely to be perceived as a risk for local communities (30%), families (29%), or respondents themselves (26%).

3.3. Policy preferences

Compared to non-evangelicals, evangelicals are significantly less likely to support all policy measures designed to mitigate

Table 2

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holistic affection</td>
<td>0.26***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Image affect</td>
<td>−0.01***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global warming concern</td>
<td>0.61***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ice melt</td>
<td>0.03***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature</td>
<td>0.04***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarmed</td>
<td>0.10***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood/sea</td>
<td>0.10***</td>
<td></td>
<td></td>
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<tr>
<td>Naysayer</td>
<td>−0.52***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Politics</td>
<td>−0.20***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weather</td>
<td>0.07***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egalitarianism</td>
<td>0.37***</td>
<td>0.22***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individualism</td>
<td>−0.20**</td>
<td>−0.02**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.18**</td>
<td>0.07**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household income</td>
<td>−0.12**</td>
<td>−0.07**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political ideology</td>
<td>0.18**</td>
<td>−0.01**</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Party ID</td>
<td>0.26**</td>
<td>0.11**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religiosity</td>
<td>−0.07</td>
<td>−0.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td>−0.01</td>
<td>0.07</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Education (4 Cat)</td>
<td>−0.06</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>F</td>
<td>240.59***</td>
<td>41.97***</td>
<td>91.03***</td>
<td>24.44***</td>
<td>46.00***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.59</td>
<td>0.36</td>
<td>0.26</td>
<td>0.24</td>
<td>0.63</td>
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<tr>
<td>N</td>
<td>509</td>
<td>509</td>
<td>509</td>
<td>509</td>
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</tr>
</tbody>
</table>

Dependent variable: risk assessment index.
Entries are standardized regression coefficients.
*** Significant at 0.05.
** Significant at 0.01.
* Significant at 0.001.
global warming (Fig. 2). The largest differences are for policies requiring electric utilities to produce at least 20% of their electricity from renewable energy sources (t (986) = −5.60, p < .001), regulating carbon dioxide as a pollutant (t (967) = −6.88, p < .001), and signing an international treaty requiring the United States to cut its emissions of carbon dioxide 90% by the year 2050 (t (983) = −5.97, p < .001). The smallest differences with non-evangelicals include support for a policy to fund more research on sources of renewable energy (t (1831) = −4.77, p < .01), and an increase in the gasoline tax (t (1133) = −3.19, p < .05).

Nonetheless, however, majorities of American evangelicals support most climate and energy policies, including funding renewable energy research (90%), tax rebates for individuals purchasing fuel efficient cars or installing solar panels (80%), requiring automakers to increase the fuel efficiency of cars, trucks and SUVs (72%), and regulating carbon dioxide as a pollutant (71%). What factors are associated with evangelical risk assessments of global warming and support for or opposition to climate change and energy policies?

Multiple regression analyses were conducted to identify the individual factors that best predict American evangelical risk assessments and policy preferences, and how much of the variance in these dependent variables is explained by global warming imagery, affect, concern, cultural worldviews, and sociodemographic variables (see Tables 2 and 3). Individual variables were initially entered into separate linear regressions to determine significance. All significant variables were then entered into the multiple regression models.

The sample size of each regression analysis was kept constant to enable comparison between models: n = 509 for risk assessment and n = 499 for policy support. These sample sizes reflect the total number of participants for which there were no missing values in the full models of each regression analysis.

3.4. Evangelical risk assessment

**Model 1**: Affect found that holistic affect associated with the term “global warming” and concern about global warming impacts on the self, others and non-human nature are significant predictors of evangelical risk assessment and explain 59% of the variance (F(3, 507) = 240.59, p < .001, Adj. R² = .59). As holistic affect becomes more negative, risk assessment increases and as concern about impacts increases, risk assessment also increases.

**Model 2**: Images found that the cognitive image categories alarmed, flood/sea level, naysayer, politics and weather significantly predict risk assessment and explain 36% of the variance (F (7, 503) = 41.97, p < .001, Adj. R² = .36). More specifically, images associated with alarmism, flooding and rising sea levels, and weather predict higher risk assessments, whereas naysayer and politics-based imagery predict lower risk assessments.

**Model 3**: Worldviews found that the cultural worldviews of egalitarianism and individualism each predict evangelical risk assessment and explain 26% of the variance (F (2, 508) = 91.03, p < .001, Adj. R² = .26). Evangelicals with an egalitarian worldview are more likely to assess global warming as a risk, whereas evangelicals with an individualistic worldview are less likely to assess global warming as a risk.

**Model 4**: Sociodemographics found that gender, household income, political ideology and political party identification each predict global warming risk assessment and together explain 24% of the variance (F (7, 503) = 24.44, p < .001, Adj. R² = .24). More specifically, evangelical women, liberals and individuals with lower incomes are more likely to assess global warming as a risk. Evangelical men, conservatives and individuals with higher incomes are less likely to assess global warming as a risk.

**Model 5**: Full – all the predictor variables were entered into a final model that explains 63% of the variance in evangelical risk assessments (F (19, 491) = 46.00, p < .001, Adj. R² = .63). Holistic affect, naysayer, politics and weather-based imagery, global warming concern, gender, household income, political party identification and ethnicity all predict global warming risk assessment. Global warming concern is the strongest predictor, after controlling for all other variables. Holistic affect and naysayer imagery are also strong predictors indicating that evangelicals who consider global warming to be a bad thing are more likely to see it as a greater risk, whereas evangelicals who provide naysayer...
associations to global warming are more likely to see it as a small or non-existent risk. The full model found that global warming concern in particular is a stronger predictor of evangelical risk assessment than affect, imagery, cultural worldviews, or sociodemographic variables.

3.5. Evangelical policy support

Model 1: Affect found that holistic affect and global warming concern significantly predict evangelical support for climate change and energy policies and explain 39% of the variance (F(3, 497) = 107.14, p < .001, Adj. R² = .39). More specifically, the more evangelicals consider global warming to be a bad thing and are concerned about its impacts on themselves, others and non-human nature, the more likely they are to support climate change and energy policies.

Model 2: Images found that alarmed and naysayer associations significantly predict policy support (F(5, 495) = 33.45, p < .001, Adj. R² = .25). This model explains 25% of the variance and found that evangelicals who associate global warming with alarmed based imagery are the most likely to support policy initiatives whereas evangelicals who hold naysayer associations are less likely to support these policies.

Model 3: Models found that egalitarianism and individualism each predict policy support and explain 32% of the variance (F(2, 498) = 116.33, p < .001, Adj. R² = .32). More specifically, evangelicals with an egalitarian worldview are more likely to support global warming policies, while evangelicals with an individualistic worldview are more likely to oppose global warming policies.

Model 4: Sociodemographics found that race/ethnicity, political ideology, party identification and education each predicts policy support, but explains only 19% of the variance (F(7, 493) = 17.28, p < .001, Adj. R² = .19). Politically liberal, non-white evangelicals with a lower education level are more likely to support global warming policies. By contrast, politically conservative, white evangelicals with higher education levels are more likely to oppose global warming policies.

Finally, Model 5: Full examined the relative contribution of all the variables and found that holistic affect, global warming concern, naysayer associations and individualism are the most significant predictors of policy support and explain 45% of the variance (F(17, 483) = 24.91, p < .001, Adj. R² = .45). Overall, evangelicals who are concerned about the impacts of global warming and who consider global warming to be a bad thing are more likely to support climate and energy policies, while evangelicals with an individualistic worldview and those who associate it with naysayer imagery are more likely to oppose these policies. More specifically, concern about global warming is the strongest predictor of policy support; stronger than affect, imagery, cultural worldviews, or sociodemographics.

4. Discussion

The present study was designed to compare evangelical vs. non-evangelical views of climate change and to investigate which of several factors derived from theory and past empirical research best predict evangelical global warming risk assessments and policy preferences. Overall, this study found that American evangelicals are less likely to believe global warming is happening, caused by human activities, and are less worried about it than non-evangelicals. Most evangelicals and non-evangelicals do not believe that global warming will seriously harm them or their family. Evangelicals, however, are less likely to perceive global warming as a threat to their local community, people in the USA, people in other modern industrialized countries, or developing countries than non-evangelicals. Evangelicals are also less likely to perceive global warming as a threat to future generations or non-human nature. Support for global warming policies, however, reveals a different picture. Although evangelicals are less likely than non-evangelicals to strongly or somewhat support climate change and energy policies, majorities of both groups do support these policies. Despite some stereotypes of evangelical Christians as anti-environmental or dismissive of climate change, it is important to note that majorities of evangelicals do believe global warming is happening, human caused, and are at least somewhat worried about it.

Evangelicals, however, are by no means homogenous. As found in the present study, evangelical risk assessments and policy preferences are related to a variety of predictors including affect, worldviews and environmental value orientations. Furthermore, evangelicals are cross-cut by socio-political dimensions leading some, for example, to be more liberal and others to be more conservative in their politics, which in turn is associated with greater or lesser engagement with the issue respectively. To some extent, this diversity of views within the evangelical community about climate change is unique. For many other social issues, including fighting AIDS and reducing poverty, evangelicals exhibit widespread agreement with each other (Nagle, 2008). Climate change, however, has become divisive within this group as it has among the broader American public.

This study found that egoistic, altruistic, and biospheric concern about the impacts of global warming was the single strongest predictor of evangelical risk assessments and policy support. The more evangelicals embraced these three types of environmental concern, the more they perceived climate change as a risk and supported climate and energy policies.

Traditionally, researchers have constructed separate indices to identify different types of environmental concern (egoistic, altruistic, and biospheric) with results supporting one, two, three and even four factor solutions (Stern et al., 1995; Thompson and Barton, 1994; Schultz, 2001, 2000; Sanelgar, 2006; Swami et al., 2010). This investigation asked participants how concerned they were about the impacts of global warming on each of these dimensions. A factor analysis found, however, that for the issue of global warming, these measures resulted in only one dimension across the full national sample. The operationalization of concern for the impacts of global warming as a specific environmental issue might have contributed to the uni-dimensional nature of the solution obtained. Compared with other issues, global warming is generally regarded as a distant threat with little personal relevance (Leiserowitz, 2005). Although concern by some evangelicals is driven by a combination of the three value orientations, the distinctions might not be as pronounced as found with other more localized and context-specific environmental issues. As such, it is difficult to identify whether the individual dimensions of biospheric, altruistic, or egoistic concern, or a combination of these dimensions, influences risk assessments and policy support. Given what is known about evangelical values, attitudes and the climate change communication strategies used by some evangelical leaders, however, some interpretations can be made.

The Evangelical Climate Initiative ‘Call to Action’, for example, argues that global warming is a fundamental moral and ethical issue, as the consequences will be most severe for the world’s poor (ECI, 2006). Other evangelical leaders argue that human beings are God’s stewards of the natural world and are thus responsible for protecting nature as God’s creation. The ‘neighbor care’ and ‘creation care’ themes evident in some evangelical communication may thus resonate with the altruistic and biospheric values held by many evangelicals (Wardekker et al., 2009; Wilkinson, 2010, 2012; Prelli and Winters, 2009).
The negative affect associated with the term "global warming" was also found to be a strong predictor of evangelical risk assessments in the present study. This supports prior research that has identified affect as playing an important role in risk perceptions for the American public more broadly (Leiserowitz, 2005, 2006; Smith and Leiserowitz, 2012), and further validates the 'risk as feelings' hypothesis (Slovic and Peters, 2006; Finucane et al., 2000).

Cultural worldviews were also found to be strong predictors of evangelical risk perception and policy support in separate models, with individualism having a significant negative effect on policy support when controlling for all other factors in the full model. Evangelicals who hold an individualistic worldview are more likely to oppose policies designed to mitigate global warming. According to cultural theory, those with an individualistic worldview are more inclined to support government regulation when personally affected (Kahan et al., 2011). More broadly, this finding speaks to the important role values can play in underpinning beliefs and attitudes toward risk issues.

More theoretically these results also indicate that, for this group, affect based value orientations, ideologies and worldviews are more important for understanding their stated positions on global warming than theological per se. As Nagle (2008) asserts, evangelicals are similar theoretically, almost by definition. Thus if evangelical engagement with global warming were driven by theological beliefs alone, opinion would be less divided. This argument is further reinforced by prominent climate scientist and evangelical Christian Katharine Hayhoe, who argues that evangelicals, unlike members of other organized religions, do not have a figurehead to seek guidance from (Palmer, 2012). Whereas Catholics have the Pope and Anglicans have the Archbishop of Canterbury, evangelicals look to politicians and others in influential positions to inform their beliefs and attitudes. For some this will be prominent Republicans who openly criticize climate change science and for others it will be Democrats who are more favorable.

In sum, this study identifies how American evangelical Christians currently perceive global warming, how they respond to the risks, and what factors influence their views. Complicating Lynn White's domination argument, American evangelicals' engagement with global warming appears primarily associated with concern about both the human and non-human impacts of climate change, in line with a stewardship ethic interpretation of Genesis. Further, American evangelicals do not have monolithic views about the issue and appear influenced by a variety of predictors including affect, worldviews and environmental value orientations. This finding has important implications for effective communication. Although strategies calling upon evangelicals to protect God's creation already exist, tailoring communications to address different groups within the evangelical community might be particularly effective.

Some evangelical leaders have suggested that evangelicals should think about how they will be judged by God on judgment day if they do not act to reduce the threat of climate change to God's creation and their fellow human beings. For example, evangelical leader Richard Cizik argues that evangelicals need to be reminded that they will be held individually accountable for their action or inaction (New York Times, 2011). Hayhoe and Farley (2009), however, argue that fear and guilt are not the preferred motivations of a loving God. They argue that ‘Love God, love others, and remember the poor’ (p. 127) is a more solid biblical mandate for taking action on climate change and one, they believe, more likely to resonate with people of faith. Past research has also identified political partisanship and ideology as an impediment preventing many conservative evangelicals from accepting climate change (Hitzhusen, 2011; Wilkinson, 2010). Avoiding the use of partisan language is thus critical, especially for efforts to engage conservative evangelicals in constructive dialog. Given the considerable political and cultural influence that evangelicals exert in the United States, it is especially important to help them understand how and why climate change connects to their own deeply held values.

Appendix A. Supplementary data


References


