Support for Climate Change Policy: Social Psychological and Social Structural Influences*

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ABSTRACT We investigated preferences for climate change mitigation policies and factors contributing to higher levels of policy support. The sample was comprised of 316 Michigan and Virginia residents, all of whom completed mail surveys. Of the eight policies proposed to reduce the burning of fossil fuels, respondents overwhelmingly indicated they would not support a gas tax, while support was highest for shifting subsidies away from fossil fuels and towards sustainable energy strategies. With the exception of taxes on gasoline and ''gas guzzlers,'' a majority of respondents supported all other mitigation policies. Multivariate analyses revealed that greater trust in environmentalists and less trust in industry, greater recognition of the consequences of climate change, higher income, being black, and older age were predictive of greater policy support. Personal values (e.g., altruism), future orientation, and political affiliation were strong predictors of policy support but only indirectly via worldviews and environmental beliefs.

Despite the adoption of the Kyoto Protocol to the United Nation Framework Convention on Climate Change by over 100 countries and the fact that the United States is the world's leading producer of carbon dioxide, the United States Congress and G.W. Bush Administration have rejected the Kyoto Protocol, arguing it would unfairly affect American businesses and the economy. The implementation of an international agreement to reduce greenhouse gas emissions without

U.S. participation raises a number of interesting questions regarding the political dynamics of efforts to protect the environment in the United States. The efforts of conservatives and some industrial sectors, such as the fossil fuel industry, to shape elite and media debate about climate change are well documented. These efforts contribute to the resulting media coverage that often exhibits a pro-corporate bias and emphasizes uncertainty, leaving audiences potentially confused and apathetic about climate change (Dispensa and Brulle 2003; McCright and Dunlap 2000, 2003). The environmental movement often is able to mobilize public opinion against such resistance. However, the environmental movement appears to have had limited success with regards to climate change. It could also be argued that the U.S. public's ambivalence toward action on climate change has also contributed to non-action, and that policymaking institutions are simply reacting to, or taking advantage of, public opinion. If the public were overwhelmingly concerned with climate change, the government would be more likely to act as it has in the past on issues like nuclear energy and toxics (Bullard and Johnson 2000).

A review of the research on U.S public concern about climate change seems to support the contention that the public as a whole is ambivalent. Several studies find that about half the U.S. public sees global warming as a serious problem (Dunlap 1998; Program on International Policy Attitudes 1998), though their concern tends to be less than citizens of other countries (Bord, Fisher and O'Connor 1998; Dunlap 1998). In ten Gallup surveys between the years 1989 and 2003, typically less than one-third of Americans said they worried about global warming a "great deal" (Brechin 2003). In addition, Americans tend to rank climate change low among environmental and other health-related concerns (Brechin 2003; Dunlap 1998). However, Brewer (2005), drawing on 40 surveys from the period of 1989–2004, argues that U.S. public concern with climate change is substantial and comparable to that in other nations. Part of the differences between these studies may be methodological—surveys that ask problems to be listed or ranked may lead to environmental problems to have relatively lower ranking than other social issues even when rating questions show substantial concern.

However one interprets the overall level of concern, a number of studies show that substantial segments of the public are willing to support some policies to mitigate climate change. Public willingness to take action to mitigate the effects of climate change appears to decrease with the difficulty or cost of the proposed actions. O'Connor et al. (2002) found that between 40 and 60 percent of

Pennsylvanian survey respondents expressed a willingness to take voluntary actions that would save them money such as buying efficient appliances. This willingness decreased when more difficult actions such as installing solar panels were considered, and then decreased even more when the action specified involved a lifestyle change, such as driving less. Brewer (2005) reported that a majority of Americans supported mandatory standards for industry. He found results consistent with those of O'Connor and colleagues—there is far less support for taxes than for efforts to develop and deploy alternative technologies.

Whatever the level of abstract concern with climate change is, it is the support for policies that is a key resource for the environmental movement in political struggles. The lack of public mobilization about climate change, in contrast to mobilization about many other environmental issues, is an important problem for environmental social science, and one that can be addressed from several perspectives. Here we examine how social psychological and social structural factors influence support for policies to mitigate climate change by reducing greenhouse gas emissions, the same kind of policies that would have to be deployed if the United States were to participate in the Kyoto Protocol. Theories of environmentalism may provide some insights into the bases of public support (or lack thereof) for such policies.

Hypothesized Predictors of Policy Support

In this section, we outline a theoretical model comprised of several factors we hypothesize will influence support for policies to reduce greenhouse gas emissions. In developing our conceptual model of policy preferences, we employ the ''values-beliefs-norms'' theory (VBN) of environmental concern and behavior. The VBN identifies possible indirect links between values and environmental behaviors (Stern 2000; Stern et al. 1999; Stern, Dietz and Kalof 1993). The theory suggests values influence general beliefs about the environment, which in turn shape beliefs about the consequences of environmental change on what is valued. The norm activation model described below suggests that specific beliefs about the threat to objects valued (AC) then affects perceptions about the ability to reduce those threats (AR), which in turn influence norms about taking action (PN).

Personal values. The VBN theory assumes that humanistic altruism, biospheric altruism, and self-interest (or egoistic) values are the most

stable determinants of environmental concern (Dietz, Fitzgerald and Shwom 2005). This means they are the hardest social psychological influences on environmentalism to change, but in the long-run value changes may have the most impact on environmental decisions (Schultz and Zelenzy 2003). Values are posited to influence worldviews and specific beliefs, meaning that when also modeling these factors, values likely will have considerable indirect influence on environmental behaviors. Therefore, we consider the effects of altruism and self-interest, which correspond with the Self-Transcendent and Self-Enhancement value clusters Schwartz (1987, 1992) identified. The effects of traditional (which Schwartz calls conservation) and openness-to-change values are also examined.

Norm activation.   Schwartz's (1968, 1977) norm-activation theory of altruism has frequently been applied to environmental behaviors (e.g., Black, Stern, and Elsworth 1985; Hopper and Nielson 1991; Stern et al. 1999; Van Liere and Dunlap 1980). This model posits that behaviors result from beliefs about the consequences of action and beliefs about personal responsibility for undertaking action. Accordingly, when individuals recognize that environmental circumstances pose threats to other people, other species, or the biosphere (called awareness of consequences [AC]), they are more likely to undertake pro-environmental behaviors. In addition, when people believe their actions could forestall or prevent those consequences (called ascription of responsibility to self [AR]), they will be more inclined to take action. Higher AC and AR are more likely to activate what Schwartz has termed a personal norm for action (PN).

Material and postmaterial values.   Inglehart (1977, 1997) has proposed a somewhat different theory of values from the VBN theory. He asserts that individuals must decide which of many goals to give preference to, and they choose those that are most important to meeting their unsatisfied needs at a particular time. As those needs change with the process of industrialization so do people's priorities, which results in a fundamental shift in values. He proposes that a new set of political and social values is emerging in industrial countries due to growing affluence and physical and economic security. These ''postmaterialist'' values emphasize quality of life, self-expression, and self-realization. Inglehart (1995) has argued that environmentalism is an outcome of postmaterialist values, but this has been highly contested (Dietz et al. 2005).

Temporal orientation.   Individuals vary in how much they think about the future and how far into the future they think. For some, concrete and certain immediate situations and consequences have a larger

influence than future, less certain events and consequences (Stratham et al. 1994). Generally, people think more about the near future than the distant future (Fingerman and Perlmutter 1995). Since climate change is happening gradually, individuals who can recognize long-ranging future consequences of actions may be more likely to identify the implications of global warming. Prior research has found that recognizing long-term consequences of behaviors relates to more pro-environmental attitudes and behaviors (Joireman et al. 2001; Joireman, VanLange, and VanVugt 2004; Lindsay and Strathman 1997). A stronger future orientation may have both direct and indirect effects on policy support. Individuals who think about long-term consequences of actions are also likely to be aware of the consequences of global warming and have a personal normative belief to act.

New ecological paradigm. Dunlap and Van Liere's (1978) New Environmental Paradigm (NEP) scale, since revised as the New Ecological Paradigm scale (Dunlap et al. 2000), has become a widely used measure of pro-environmental orientation. It is based on the idea that a new worldview was emerging that was dramatically different from the previous Dominant Social Paradigm (DSP). The DSP reflects beliefs in progress and development, science and technology, and a laissez-faire economy, all in forms that do not give much weight to environmental protection. The NEP, in contrast, emphasizes limits to growth, a ''steady-state'' economy, and natural resource preservation. The NEP scale considers an individual's general beliefs about the biosphere and the effects human actions have on it (Stern, Dietz and Guagnano 1995). Higher NEP is likely to lead to more pro-environmental attitudes about specific environmental problems and to greater support for climate change related policies.

Trust. The risk perception literature posits that trust is a key element in public acceptance of government policies (Kunreuther, Slovic and MacGregor 1996; Laird 1989; Siegrist, Cvetkovich and Roth 2000). Low levels of knowledge and other resources increases the difficulty individuals have in making direct and adequate assessments about the risks and benefits of various technologies and environmental policies. It has been suggested that individuals' trust in relevant institutions and agencies plays a particularly salient role in their decision-making in such uncertain circumstances (Cvetkovich et al. 2002; Earle and Cvetkovich 1995). Given the complex issues involved in climate change and the conflicting media reports about the realities and causes of climate change, we expect trust in government agencies,

industry, and environmentalists will influence climate change policy support.

Climate change information and knowledge.   The public lacks an understanding about global warming and its causes. People tend to view ''global warming'' as an overall term that includes stratospheric ozone depletion and tend to confuse weather and climate (Bostrom et al. 1994; Dunlap 1998; Henry 2000; Kempton 1991; Read et al. 1994). Additionally, in a recent study only 11 percent of Americans correctly stated that burning of fossil fuels was the largest anthropogenic source contributing to global warming (Brechin 2003). While studies have found mixed effects regarding the relationship between knowledge and environmental concern (see Hines, Hungerford, and Tomera 1986/1987 for a review), O'Connor, Bord, and Fisher (1999) found that knowledge about the causes of global warming did predict people's behavioral intentions. Individuals who are misinformed about the causes of climate change are unlikely to support policies or take the right actions to reduce the burning of fossil fuels.

We also consider the amount of information individuals obtain from media sources. It is expected that more information would result in greater recognition of the effects of climate change and therefore greater policy support. However some studies reviewing the content of media information on climate change found media sources often express uncertainty about the causes and occurrence of global warming (Dispensa and Brulle 2003), as well as have a pro-corporate bias (Nissani 1999). Thus if a person has primarily learned about climate change from newspapers and television reports, s/he may not have information reflecting the views of mainstream science.

Personal finances.   Given the same level of knowledge and concern about climate change, policy support may vary as a function of income and perceptions about future income. People with greater disposable income may be more inclined to support policies that place fiscal responsibility on individuals (Klineberg, McKeever and Rothenbach 1998).

Social structural characteristics.   Social structural factors tend to have modest relationships with environmental outcomes. The relationships between specific social structural characteristics and environmentalism tend to depend on the type of environmental attitude or behavior asked about, although some general patterns can be identified. A liberal political orientation (Mohai and Bryant 1998; O'Connor et al. 2002; Uyeki and Holland 2000; see Dunlap et al. 2001 for a recent detailed analysis of politics and environmental concern), higher levels of education (Howell and Laska 1992; Klineberg et al. 1998; VanLiere
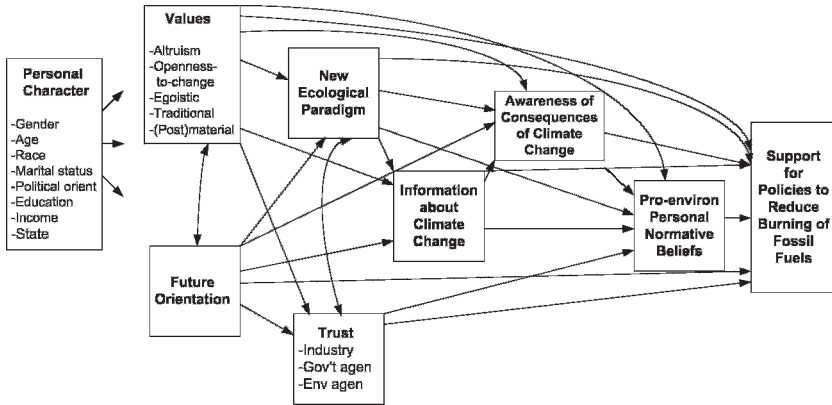
Figure 1. Hypothesized Causal Model of Predictors of Support for Policies to Reduce Greenhouse Gas Emissions

and Dunlap 1980), and younger age (Buttel 1979; Klineberg et al. 1998) tend to be associated with more support for environmental policies and behaviors than their counterparts. Generally, women are more concerned about environmental issues (e.g., Davidson and Freudenburg 1996; Stern et al. 1993), although it has been posited that gender differences are due to perceived vulnerability to risk (Bord and O'Connor 1997). The observed relationship between race and environmental outcomes has varied (Mohai 1990; Mohai and Bryant 1998). Regarding support for climate change policies, O'Connor and colleagues (1999, 2002) found that higher levels of education were associated with greater climate change policy support, but the effects of age and gender were mixed. We also control for the state in which study participants live (see the sample section for details on differences between the two states considered in this study—Michigan and Virginia).

Causal Model of Predictors of Policy Support

Our hypothesized causal model is depicted in Figure 1 (only major hypothesized pathways are depicted). The causal ordering is based in part on a prior conceptualization that combines the norm activation and VBN theories (Stern 2000; Stern et al. 1995; Stern et al. 1999; Stern, Dietz, and Guagnano 1995). First in the causal chain are measures of social structure and personal characteristics. Social structure shapes the values, beliefs, and attitudes people hold. Values and future orientation are positioned causally antecedent to general and specific beliefs and attitudes. Values are likely formed early in life, within the family, and

tend to remain stable over the life course. Temporal orientation is placed in the same causal positioning as values because psychologists conceptualize it to be a stable, trait-like characteristic.

Following values and future orientation are general beliefs about the world, measured by the New Ecological Paradigm and trust. These general beliefs are likely to be shaped by not only social structure and values but also experiences in the world and are thus more malleable than are one's values. Consistent with our causal placement, trust has been conceptualized as being affected by values and as predictive of attitudes about perceived environmental risks and benefits (Siegrist et al. 2000). We propose that values and general beliefs (i.e., worldviews) are causally prior to more specific beliefs, attitudes, and behaviors, such as attitudes about a particular environmental issue. Following NEP and trust in the model is information about climate change. Extent of information is expected to be influenced by more general beliefs, values, and social structural characteristics and may affect attitudes about and the level of support given to policies to reduce the burning of fossil fuels.

Values, general beliefs, and information are hypothesized to influence awareness of consequences about climate change. General awareness of consequences will affect the level of responsibility ascribed for the consequences (not measured in this study), which in turn leads to a personal normative belief to act. The final outcome in our model is support for climate change related policies.

Sample

One thousand households were randomly selected from telephone listings provided by GENESYS Inc. Half of the households resided in Michigan and the other half in Virginia. Traditionally Michigan has been dependent on automobile and manufacturing industries. In contrast Virginia has many government employees, and parts of the state are dependent on coal mining. About 70 percent of the population in both states is urban, while both also have a substantial 9–10 million acres in agriculture. This two-state sampling frame was used because a key study on which we build (O'Connor et al. 2002) was based on data from a single state. Respondents in this sample were asked to participate in an experiment involving a second (follow-up) survey, which will not be discussed here. We have subsequently conducted a series of surveys with the same questions about climate change policy preferences with national samples. These national surveys were considerably shorter in length and did not contain most of the variables included in this paper.

An eight-page survey, containing questions measuring preferences for policies to reduce the burning of fossil fuels, views on climate change, general values, and demographic characteristics, was mailed to the sample in the fall of 2004. The survey took approximately 10–20 minutes to complete, and consisted of close-ended questions. Well-established data collection protocols were followed (Dillman 2000; Dillman et al. 1974; Mangione 1998). All potential members of the sample were initially sent a letter explaining the nature of the study, a copy of the survey, consent information, a return envelope with prepaid postage, and a small token of appreciation. Three follow-up letters, including a mailing with a duplicate questionnaire and return envelope, were used to maximize the response rate.

Three hundred and sixteen surveys were completed, with almost equal returns from each state (N=157 in MI; N=159 in VA). Sixty-five survey packets were returned due to bad addresses or undeliverable mail. Thus, the overall response rate was 38 percent. The relatively low response rate is likely due to the fact that this study was more involved than one-time only surveys, since all those sampled were told that the study would include a second, follow-up survey.

Despite the response rate, the sample in both states had gender and age compositions similar to those reported for Virginia and Michigan by the U.S. Bureau of the Census (2000), but had fewer non-whites (except a higher percentage of Asians in the Virginia sample than in the population) and a higher proportion of post-college educated individuals. There were no differences in demographic characteristics between respondents in Virginia and Michigan, except for occupation, where, as noted above, there are some substantial differences across the states. The low response rate compared to historical norms for mail surveys (Dillman 2000) was a limitation of this study. However, the comparison between sample and Census demographics suggested sampling biases may not be too extreme. Furthermore, a comparison of our sample's support for each of the policies to the support levels of the samples in O'Connor and colleagues' (1999, 2002) studies and our national samples indicated that similar percentages supported each of the policies. In addition, we examined the strength and pattern of relationships between the variables in our model that have been used in prior studies (i.e., NEP and values) and found that relationships are generally similar to those in prior research (e.g., O'Connor et al. 1999; Stern et al. 1995). These findings suggest that individuals with a particular set of values or environmental beliefs were no more or no less likely to respond to our survey than they were to respond to surveys of similar topics.

Table 1. Measures and Confirmatory Factor Analysis Results

	Factor Loadings	Reliability (Alpha)
Climate Change Policy Preferences		.89
Tough new regulations to discourage the use of coal.	.81	
National tax on businesses using coal & oil as fuels.	.79	
Tax to fund government program to replace coal-burning power plants.	.70	
Policy to increase automobile fuel efficiency	.74	
Gas guzzler tax on vehicles that get <25 mpg.	.73	
60-cent per-gallon gas tax.	.66	
Shift government subsidies away from the fossil fuel industry.	.69	
Tax subsidy to houses/businesses that use solar/wind energy.	.60	
Traditionalism*		.51
Honoring parents and elders, showing respect	.64	
Family security, safety for loved ones	.61	
Self-discipline, self-restraint, resistance to temptations	.33	
Altruism*		.85
Respecting the earth, harmony with other species	.86	
Protecting the environment, preserving nature	.86	
Unity with nature, fitting into nature	.72	
Social justice, correcting injustice, care for the weak	.61	
Equality, equal opportunity for all	.49	
A world of peace, free of war and conflict	.47	
Openness-to-change*		.73
A varied life, filled with challenge, novelty and change	−.73	
An exciting life, stimulating experiences	−.67	
Curious, interested in everything, exploring	−.62	
Egoistic*		.66
Social power, control over others, dominance	.89	
Authority, the right to lead or command	.61	
Wealth, material possessions, money	.40	
Material Values		.67
Fighting rising prices	.84	
Maintaining order in the nation	.57	
A stable economy	.56	
Postmaterial Values		.70
Protecting freedom of speech	.56	
Giving people more say in government	.62	
Moving to a more humane society	.78	
Future Orientation		.74
I consider how things might be in the future, and try to influence those things with my day to day behavior.	.64	
I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years.	.69	
I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.	.65	
I only act to satisfy immediate concerns, figuring the future will take care of itself (reverse coded).	.45	
I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time (reverse coded).	.50	

Table 1, Continued

	Factor Loadings	Reliability (Alpha)
I think it is more important to perform a behavior with important distant consequences than a behavior with less important immediate consequences.	.40	
New Ecological Paradigm (NEP)*		.78
The so-called ''ecological crisis'' facing humankind has been greatly exaggerated (reverse coded).	.76	
If things continue on their present course, we will soon experience a major ecological catastrophe.	.75	
Humans are severely abusing the environment.	.63	
The balance of nature is strong enough to cope with the impacts of modern industrial nations (reverse coded).	.58	
The earth is like a spaceship with limited room and resources.	.51	
Trust in industry		.80
Coal companies	.88	
Oil companies	.81	
Scientists working for industry	.62	
Trust in government		.78
The Department of Energy	.81	
The Environmental Protection Agency	.81	
Scientists working for government	.62	
Trust in environmentalists		.83
National environmental groups	.89	
Scientists working for environmental groups	.87	
Awareness of climate change consequences		.92
Health problems in <state> will increase.	.83	
Health problems in world will increase.	.81	
Standard of living of many people in <state> will decrease.	.69	
Standard of living of many people in world will decrease.	.75	
Number of species lost in <state> will increase.	.78	
Number of species lost in world will increase.	.76	
Personal normative belief		.74
I worry that the next generation will feel we didn't do enough to prevent climate change.	.68	
We have a responsibility to future generations to deal with climate change.	.69	
There is no urgent need to take measures to prevent climate change today (reverse coded).	.70	
Even if only some species are threatened by climate change, we should act to protect them.	.53	
It's too costly for the U.S. to reduce use of fossil fuels (reverse coded).	.43	

* These are exploratory factor analysis results; confirmatory factor analysis was not used with these scales to simplify the model and because the scale's properties have been previously extensively tested.

Measures

Measures for all scales and their confirmatory factor loadings are presented in Table 1.

Climate change policy preferences. We utilized six questions O'Connor and colleagues (1999, 2002) developed, which asked respondents to

Table 2. Climate Change Policy Preferences

	Definitely Yes	Probably Yes	Probably No	Definitely No	Rough estimate of annual cost
Shifting federal government subsidies away from the fossil fuel industry (coal, oil, natural gas) to the renewable energy industry (wind, solar, biomass, etc.) to encourage cleaner forms of energy. This would make fossil fuels more expensive and renewable energy less expensive. Scientists cannot estimate the exact amount by which energy prices would change. The policy also might cause job losses in some industries and gains in others.	22.3 (68)	51.8 (158)	21.3 (65)	4.6 (14)	—
An *energy tax* to fund a new government program to replace power plants that burn coal. The program would replace coal plants with new plants that would use cleaner sources of energy. The program would cost about $20 per household per month.	16.1 (49)	41.3 (126)	32.5 (99)	10.2 (31)	$240
Tough new regulations to discourage the use of coal. This would lead to a loss of jobs in the coal industry but may increase jobs in other energy industries. These regulations would raise the price of electricity, adding about $20 per month to the typical electrical bill.	11.5 (35)	39.7 (121)	35.7 (109)	13.1 (40)	$240
A *federal tax subsidy* to households and businesses that use solar and wind energy. Paying for the subsidy to those who use solar and wind energy would increase the average family's income tax bill by about $100 per year.	17.0 (52)	39.2 (120)	33.3 (102)	10.5 (32)	$100
A national *tax on businesses* that use coal and oil as fuels in their manufacturing. This encourages energy efficiency and the use of fuels that don't cause climate change. This tax would raise the cost of most things you buy by 2 percent.	12.5 (38)	43.3 (132)	29.2 (89)	15.1 (46)	—

Table 2, Continued

	Definitely Yes	Probably Yes	Probably No	Definitely No	Rough estimate of annual cost
A 60-cent per-gallon *gasoline tax,* over and above existing gas taxes, to encourage people to drive less.	7.2 (22)	10.7 (33)	40.4 (124)	41.7(128)	—
A 10 percent *"gas guzzler" tax* on vehicles that get less than 25 miles to the gallon. This would add about $2,000 to the price of a $20,000 vehicle.	22.9 (70)	25.5 (78)	27.8 (85)	23.9 (73)	$400[1]
A requirement that *automobile fuel efficiency* be increased from the current average of 28 mpg to 33 mpg. To maintain comfort and performance, new car prices would go up by an average of $2000 per car.	21.5 (66)	39.7 (122)	25.7 (79)	13.0 (40)	$400[1]

[1] Assumes a vehicle life of five years.

indicate the probability they would support a referendum on different policy options to reduce the burning of fossil fuels. While many express general support for the environment and environmental policies, when given specific information about the costs of such policies, support tends to drop significantly (Bord et al. 1998). Therefore, most policy questions included an estimate of how much such a measure would cost the average household. We included two additional policy questions: tax subsidy to households and businesses using solar and wind energy and shifting federal government subsidies away from the fossil fuel industry to encourage cleaner forms of energy.[1] Table 2 presents the policy proposals and support levels. Response options were ''definitely no'' (1), ''probably no'' (2), ''probably yes'' (3), and ''definitely yes'' (4). The eight items formed a reliable one-factor scale (alpha=.89),[2] so while mobilized political

[1] A similar policy proposal was asked in Leiserowitz's (2002/2003) study of Americans' views on global warming.

[2] A two-factor solution also had a clean structure (i.e., items did not have secondary loadings greater than 0.2); the automobile items—gas guzzler tax, gas tax, and increasing automobile efficiency—formed a separate factor. The only item that had dual loadings (both >0.3) was the tax on businesses using coal and oil. The two factors had similar correlations with all other variables in the dataset and the SEM model showed both policy factors had similar predictors. Since our interest is primarily in a social psychological model, the one-factor solution will be pursued.

interests might differentiate among mitigation policies, the public does not.

Social structure and personal characteristics. Respondent's age, gender, race (collapsed into white or non-white), education level (number of years), annual income, political orientation, marital status (collapsed into married or non-married), and union membership were ascertained. Annual income was measured with four categories: ''under $25,000'' (1), ''$25,000–$49,999'' (2), ''$50,000–$74,9999'' (3), ''$75,000 and over'' (4). Political orientation was assessed on a 1–6 scale from ''strongly conservative'' to ''strongly liberal.''[3]

Value orientations.   Fifteen items from Schwartz's (1992) value scale, as modified by Stern et al. (1993) and Stern, Dietz, and Guagnano (1998), were used to assess the four major value clusters. Respondents were asked to ''indicate how important each of these is a guiding principle in your life…'' Questions were measured on a 1–5 scale, from ''not at all important'' to ''extremely important.'' Three items each were included to measure traditional (conservation), egoistic (self-enhancement),[4] and openness-to-change values, and six items tapped altruism (self-transcendence). Mean scores were created.

Post-material and material values.   A modified version of Inglehart's (1997) material and post-material values' scale was included in the survey. Rather than asking individuals to rank what the aims of this country should be in the next ten years, our respondents were asked to rate how important six goals (of Inglehart's twelve items) should be for the country in the next decade on a scale from ''not at all important'' (1) to ''extremely important'' (5). Items reflecting material values included maintaining order in the nation, fighting rising prices, and a stable economy. Protecting freedom of speech, moving toward a more humane society, and giving people more say in important government decisions tapped post-material values. We modified the original scale to ease respondent completion and accommodate limited space in the survey. The unidimensionality of Inglehart's scale has been challenged (Rossteutscher 2004; Sacchi 1998). Consistent with another study that

[3] Political affiliation was also asked. Analyses based on affiliation were similar to results with political orientation, so only political orientation results are presented. Dunlap, Xiao, and McCright (2001) discuss the importance of more nuanced measures of ideology.

[4] Two additional items were included to measure self-enhancement—''successful, achieving goals'' and ''influential, having an impact on people and events''—but they, surprisingly, had primary loadings on the openness-to-change factor, so they were excluded.

used ratings rather than rankings (Bean and Papadakis 1994), the rated items formed two distinct factors and were positively correlated, rather than forming one factor with one set of values having positive loadings and the other set having negative loadings on the factor.[5] All items had sufficient factor loadings (>0.5), and none had cross-loadings on the other factor (all <0.2). The reliability of each of these scales was moderate (see Table 1).[6]

Temporal orientation. Respondents were asked six questions from Strathman and colleagues' (1994) 12-item Consideration of Future Consequences (CFC) scale. Items tapped a person's tendency to consider potential future consequences of one's behaviors. Response options ranged from (1) ''extremely uncharacteristic'' (of the respondent) to (5) ''extremely characteristic.'' All items had reasonable factor loadings (>0.4), and the scale was moderately reliable.

NEP. A five-item subset of the widely-used New Ecological Paradigm (NEP) scale (Dunlap and Van Liere 1978) that measures environmental beliefs about the Earth and human-environment relationships was included in the survey. This reliable subset has been used previously (Stern et al. 1999). Response options ranged from ''strongly disagree'' (1) to ''strongly agree'' (4). The reliability of this scale in this study was high (alpha=0.78).

Trust. A list of U.S. organizations and institutions was given to study participants, and they were asked how much trust they have in each, with responses ranging from ''no trust at all'' (1) to ''very much trust'' (5). Factor analyses identified three conceptual trust scales. Trust in government agencies was comprised of three items: Department of Energy, Environmental Protection Agency, and scientists working for the government (alpha=0.78). Trust in industries consisted of trust in oil companies, coal companies, and scientists working for industry

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[5] Inglehart (1997) argues that this difference occurs because individuals who are not asked to rank priorities tend to view all goals as important (or in contrast unimportant).

[6] Since Inglehart asserts that material and postmaterial values are conceptually unidimensional, we also created an index similar to that used with the original scale: individuals were given a score of ''1'' if they prioritized material goals (in this case, ranked them, on average, as more important than the post-material goals), ''2'' if they equally prioritized material and postmaterial goals, and ''3'' if they prioritized postmaterial goals. Note that very small differences in ratings of material (e.g., scores of 3, 4, and 3 on the three items) and postmaterial goals (e.g., scores of 4, 4, and 3) were given overall scores of ''2'' on this index. Findings using this ranked-based measure were similar to the results for the two ratings-based measures. Only political orientation was predictive of this measure, and the scale was only predictive of the number of sources of climate change information and self-rated knowledge.

(alpha=0.80). The third trust scale included trust in national environmental groups and scientists working for environmental groups (alpha=0.83).

Climate change information. To assess degree of exposure to climate change information, respondents were asked whether they had obtained climate change information in the prior year from seven sources: newspaper articles, magazine articles, books, television shows, movies, internet websites, and discussions with family or friends. The total number of sources of information was summed. As a second measure of climate change information, the following was asked: ''Overall, how well informed about climate change do you consider yourself?'' Responses included: ''I know very little'' (1), ''I know something about climate change'' (2), and ''I know a great deal about climate change'' (3). This item was moderately correlated with the scale tapping exposure to climate change information (r=0.50).

Awareness of consequences. Six survey items were designed to measure beliefs about the possible negative consequences of climate change to individuals and other species. Some items were adapted from O'Connor and colleagues' (1999) ''bad consequences'' scale. Respondents were asked how likely the following would occur in their *state* and in the *world* due to climate change: increase in health problems, reduced standard of living for many people, and increase in number of species lost. Thus while some theories postulate a distinction between localized and global concerns and between environmental effects on humans and on other species, we found concern with consequences to be a unidimensional scale. Responses were ''very unlikely'' (1), ''somewhat unlikely'' (2), ''somewhat likely'' (3), and ''very likely'' (4). This scale was highly reliable (alpha=0.92).

Pro-environmental personal normative beliefs. Five items constituted normative beliefs about climate change. Respondents indicated the extent to which they agreed with each statement (1–4 scale from strongly disagree to strongly agree). These questions are listed in Table 1. The alpha reliability value for this scale was 0.74.

Analytic Strategy

Structural equation modeling (SEM), specifically AMOS 5.0 (Arbuckle 2003), was used to test the proposed causal model. SEM is advantageous because it allows for simultaneous testing of the measurement and

structural models, simultaneously tests direct and indirect effects of model variables on multiple outcomes, and adjusts for measurement error. Before running the SEM models, a series of exploratory factor analyses was conducted to help determine scales' measurement properties before placing them into a confirmatory factor analysis. Due to the complex nature of the model and the large number of parameters to be estimated, we simplified the model by including only the composite scales of Schwartz's four scales and the NEP in SEM, since their measurement properties have been well established in the literature.

We ran six structural equation models, beginning only with the social structural and personal characteristics, then added values and temporal orientation to the model, and so forth through the causal chain. While the primary model of interest includes all hypothesized variables, the separate models allow us to consider the relative contributions of each set of variables. Fully saturated models (i.e., all potential pathways) were tested. The disturbance or error terms between scales/variables in the same causal position were all correlated. To examine the fit of the model, multiple indices were considered, including the comparative fit index (CFI), root mean square error of approximation (RMSEA), Tucker Lewis index (TLI), and chi-square test. The RMSEA, TLI, and CFI are less sensitive to sample size than are other measures, like the chi-square test (Fan, Thompson, and Wang 1999). Models were estimated by full information maximum likelihood estimation (FIML) with missing data (Arbuckle 1996). This technique allows AMOS to use all information available for all study participants, which helps increase the effective sample size. It also corrects for biases that are introduced when traditional missing data procedures of listwise and pairwise deletion are used. Modification indices were examined to identify potential parameters that should be added or deleted to improve the fit of the model. Only those parameters that improved the model's fit while making conceptual sense were added or deleted.

Results

Descriptives

Climate change policy support. The average level of support for the climate change policies was 2.5 (SD=0.7, range=1–4). There was substantial difference in public support across the eight policy

proposals (see Table 2). Policies with the most direct impact on individuals' lives and pocketbooks—the gas tax (only 18% said they would be inclined to vote in favor of this) and the tax on large vehicles (less than half the sample supported this)—received the least amount of support. Interestingly, there was not as much opposition to the proposal to increase automobile fuel efficiency (61% supported this policy). In contrast, shifting government subsidies away from the fossil fuel industry to encourage cleaner forms of energy received the most support (three-fourths of the sample supported this); it is notable though that this was the only policy proposal that did not include a specific cost estimate. Just over half the sample said they would be inclined to vote for the other five policy proposals.

Predictors.   Almost equal numbers of men and women and Michiganders and Virginians were in the sample. Respondents' mean age was 51 (SD=15.1, range=18–90), and two-thirds of respondents were married. The average number of years of education was 15 (SD=2.9, range=6–26). Fourteen percent of the sample had annual income less than $25,000; 23 percent had income in the $25,000–$49,999 range, 27 percent in the $50,000–$74,999 range, and 37 percent had income over $75,000. Forty-two percent of the sample considered themselves conservative (either strongly conservative, conservative or slightly conservative), one-third said they were independent, and one-quarter were liberal.

Turning to values, respondents tended to have high scores on traditional and altruistic values (means=4.2 and 3.9 respectively on a 1–5 scale). Average scores on the openness-to-change scale were slightly lower (3.6), and respondents did not tend to be highly egoistic (2.2). Mean material and post-material scores were high (4.4 and 4.1 on a 1–5 scale). Respondents tended to recognize the long-ranging consequences of actions (mean=3.8 on a 1–5 scale), and the mean NEP score was 2.9 on a 1–4 scale. On average, respondents had the lowest amount of trust in industry (mean=2.1 on a 1–5 scale), then in government (2.8) and environmentalists (3.0). Two-thirds of the sample said they had some knowledge about climate change, and 28 percent said they knew little about climate change. Only 9 percent said they had a lot of knowledge. Eight percent of respondents had not obtained climate change information from any of the sources about which we asked. One-quarter obtained climate change information from one or two of the sources, 40 percent from three or four sources, and one-quarter from five or more sources. The scores on the scales measuring awareness of consequences and personal normative beliefs

averaged just above the midpoint at 2.7 and 3.0 (range=1–4) respectively.

Multivariate Results

Table 3 presents each of the six structural equation models tested. The results represent the final models, after modifications were made. Modification indices suggested adding correlation pathways between the error terms for the policies for a tax to replace coal-burning power plants and regulations to discourage coal use, for two future orientation items, and for six pairs of error terms between the AC items. The fit indices in Table 3 demonstrate the models generally achieved good fit (defined as CFI and TLI values near or greater than 0.9 and RMSEA near to 0.05 with a 90% CI). However, once personal normative beliefs (PN) were added in the final model (Model 6), multicollinearity became a serious issue. The coefficients for NEP and AC changed substantially when PN was added (Model 6, Table 3) so that none of these scales remained significantly associated with policy support with the addition of PN (all are highly correlated with policy support at the bivariate level). Further examination of the data indicated the composite PN scale was highly correlated with NEP (r=0.78) and more moderately with AC (r=59). Since NEP has been widely used and found to be a valid and reliable measure, the multivariate results described throughout the balance of the paper were based on the model excluding PN (rather than excluding NEP), which consisted of newly created items (Model 5, Table 3).

   With this modification, our hypothesized model explained 66 percent of the variance in policy support (see Model 5, Table 3). Results indicated that greater trust in environmental groups, less trust in industry, greater awareness of the consequences of climate change, higher income, older age, and being black directly predicted greater policy support. Examination of the separate models revealed that political orientation, altruistic and traditional values, future orientation, NEP, and state of residence all were statistically significant predictors of policy support until additional variables were included (Models 1–4, Table 3). Table 4 presents the predictors of each endogenous variable in the causal model, which provides details about the pathways by which different values, characteristics, world-views, and attitudes affect policy support. The strength of the direct, indirect, and total effects of each variable on policy support are presented in Table 5.

Table 3. SEM Results–Models Predicting Climate Change Policy Support Standardized (Unstandardized) Coefficients

	Model 1: Social Structural Character	Model 2: + Values and Fut Orient	Model 3: + Worldviews	Model 4: + Info	Model 5: + Awareness Consequence	Model 6: + Personal Norm Belief
Age	.13 (.00)	.11 (.00)	.18 (.01)**	.19 (.01)**	.18 (.01)**	.26 (.01)*
Education	−.05 (−.00)	−.05 (−.01)	−.08 (−.02)	−.07 (−.01)	−.07 (−.01)	.09 (.02)
Male	−.10 (−.11)	−.08 (−.08)	−.04 (−.04)	−.03 (−.03)	.00 (.00)	−.01 (−.01)
White	−.17 (−.01)**	−.14 (−.01)*	−.17 (−.01)**	−.19 (−.01)***	−.21 (−.01)***	−.24 (−.01)**
VA (v. MI)	.19 (.20)***	.14 (.15)**	.10 (.11)*	.11 (.11)*	.09 (.09)	.06 (.06)
Politically liberal	.45 (.16)***	.24 (.08)***	.07 (.02)	.07 (.03)	.08 (.03)	.05 (.02)
Income	.12 (.06)	.11 (.06)	.12 (.06)*	.13 (.06)*	.13 (.07)*	.04 (.02)
Altruism	—	.24 (.18)**	−.07 (−.05)	−.07 (−.05)	−.13 (−.10)	−.27 (−.20)
Egoism	—	.03 (.02)	.02 (.02)	.01 (.01)	−.01 (−.01)	.01 (.01)
Open-to-change	—	.02 (.01)	.04 (.02)	.04 (.03)	.04 (.02)	−.00 (−.00)
Traditionalism	—	−.13 (−.13)*	−.02 (−.02)	−.03 (−.02)	−.02 (−.01)	.05 (.04)
Materialism	—	−.09 (−.14)	−.15 (−.23)	−.16 (−.19)	−.13 (−.20)	−.07 (−.10)
Post materialistic	—	.09 (.09)	.17 (.16)	.18 (.19)	.19 (.18)	.15 (.14)
Future orient	—	.25 (.27)**	.06 (.07)	.04 (.04)	.03 (.03)	−.23 (−.24)
NEP	—	—	.21 (.16)**	.22 (.17)**	.06 (.06)	−.59 (−.46)
Environ trust	—	—	.37 (.21)***	.38 (.21)***	.38 (.22)***	.34 (.19)*
Gov't trust	—	—	.13 (.13)	.13 (.12)	.13 (.12)	.09 (.08)
Industrial trust	—	—	−.29 (−.24)***	−.28 (−.23)***	−.30 (−.25)***	−.32 (−.26)**
# cc sources	—	—	—	−.02 (−.01)	−.04 (−.01)	.01 (.00)
Extent informed	—	—	—	−.04 (−.04)	−.04 (−.04)	−.10 (−.10)
Awareness Cons	—	—	—	—	.25 (.18)**	.10 (.07)
Personal norm	—	—	—	—	—	1.12 (.96)
MR²	.29	.47	.63	.64	.66	.72
Chi²	144.0	602.8	1147.3	1195.3	1481.6	1860.4
DF	68	343	586	627	853	1083
CFI	.95	.91	.88	.88	.90	.89
TLI	.90	.87	.83	.83	.87	.86
RMSEA (90% CI)	.060 (.046–.073)	.049 (.043–.055)	.055 (.050–.060)	.054 (.049–.058)	.048 (.044–.052)	.048 (.044–.051)

*p<.05, **p<.01, ***p<.001.

Information.   Contrary to expectations, information about climate change (neither number of sources of information nor self-rated knowledge) did not affect level of policy support and was not indirectly associated either.

NEP.   As previously stated, NEP was predictive of policy support until AC was included in the model. NEP was highly predictive of AC and, therefore, was indirectly related to policy support.

Trust.   Both less trust in industry and greater trust in environmental groups affected policy support, while trust in government agencies had no influence.

Future orientation.   Future orientation was a large indirect predictor of policy support via environmental trust and NEP (see Table 5).

Material and post-material values.   The post-material and material values scales were not statistically significantly predictors of any model variables. The exception was that material values predicted having fewer sources of climate change information, although this was not a factor affecting policy support.

Other values.   As Table 5 indicates, of all the values, altruism had the strongest total effect on climate change policy support. Greater altruism was associated only indirectly with policy support though via higher AC, NEP, and environmental trust. Traditional values had more modest indirect effects, with less traditional values associated with higher NEP. Contrary to our hypothesis, egoistic values only had a very modest relationship with policy support, as it was a significant positive predictor of all three trust scales but was not predictive of any other variable. Openness-to-change was not related to any other model variable.

Social structural characteristics.   Of all the social structural and personal characteristics, political orientation had the largest total effect on policy support, although its effects were mostly indirect. Being more liberal predicted greater environmental trust, NEP, future orientation, altruism, and less traditional values. All of these had either direct or indirect relationships with policy support. Consistent with expectations, policy support was stronger among higher income persons. Race only had a direct relationship with policy support, with blacks having greater levels of support. There were gender differences in several of the model variables, although gender's effects on policy support were small. Compared to men, women had greater AC, environmental trust, altruism, and traditionalism and less egoism. While older age was predictive of greater policy support, interestingly older age was also associated with greater trust in industry, which predicted less policy support. Education was only predictive of greater openness-to-change

Table 4. Final SEM Model: Predictors of all Endogenous Variables - Standardized (Unstandardized) Coefficients

	Policy Supp	Aware Cons	Extent Info	#Climate Sources	Indust Trust	Gov't Trust	Environ Trust
Age	.18 (.01)**	.04 (.00)	.09 (.00)	−.03(−.00)	.20(.01)*	.02 (.00)	−.06 (−.00)
Educ	−.07 (−.01)	−.01 (−.00)	.13 (.03)	.07 (.04)	−.03(−.01)	.14 (.03)	−.03 (−.01)
Male	.00 (.00)	−.14 (−.21)**	.25 (.28)***	.23 (.77)***	−.11(−.14)	−.09(−.10)	−.12 (−.23)*
White	−.21(−.01)***	.05 (.00)	−.13(−.01)	−.07 (−.01)	−.10(−.01)	−.06(−.00)	.10 (.01)
VA	.09 (.09)	.06 (.09)	−.01 (−.01)	−.06 (−.22)	.06 (.07)	.10 (.11)	.07 (.13)
Liberal	.08 (.03)	−.04 (−.02)	−.04 (−.02)	−.03 (−.04)	−.06(−.03)	−.13(−.05)	.29 (.18)***
Incom	.13 (.07)*	−.03 (−.02)	.02 (.01)	−.01 (−.02)	.05 (.03)	−.01(−.01)	.03 (.03)
Altruis	−.13 (−.10)	.27 (.27)**	−.04 (−.03)	.08 (.19)	−.20(−.17)	.18 (.14)	.38 (.50)***
Egois	−.01 (−.01)	.09 (.09)	−.15 (−.11)*	−.06 (−.12)	.19(.16)**	.14(.10)*	.12 (.14)*
Op chg	.04 (.02)	.02 (.02)	.12 (.09) (p=.054)	.10 (.21)	−.03(−.02)	−.11(−.08)	.01 (.02)
Tradit	−.02 (−.01)	−.07 (−.09)	−.12 (−.12)	.04 (.13)	.12 (.13)	−.10(−.10)	−.11 (−.18)
Mater	−.13 (−.20)	−.12 (−.25)	−.08(−.13)	−.33(−1.56)**	.12 (.23)	.13 (.22)	.09 (.25)
Posmat	.19 (.18)	−.01 (.−01)	.19 (.19)	.24 (.72)	−.03(−.03)	−.16(−.16)	−.09 (−.16)
Fut or	.03 (.03)	.04 (.05)	.12 (.13)	.12 (.39)	−.19(−.23)	.21 (.23) (p=.055)	.26 (.48)**
NEP	.06 (.06)	.57 (.61)***	.08 (.07)	.17 (.43)*	—	—	—
En trus	.38(.22)***	−.02(−.02)	.01 (.01)	−.02 (−.03)	—	—	—
Gov tr	.13 (.12)	−.01 (−.02)	.01 (.01)	−.06 (−.18)	—	—	—
Ind tr	−.30(−.25)***	.09 (.11)	.02 (.02)	.12 (.31)	—	—	—
#sourc	−.04 (−.01)	.05 (.02)	—	—	—	—	—
Ex inf	−.04 (−.04)	.02 (.03)	—	—	—	—	—
AC	.25 (.18)**	—	—	—	—	—	—
MR^2	.66	.59	.19	.25	.23	.12	.51

*p<.05, **p<.01, ***p<.001

and fewer material and postmaterial values, none of which related to policy support. State of residence had a modest effect on policy support and was not a significant predictor of any variable except future orientation.

Discussion

The vast majority of respondents in this study expressed some willingness to support policies to reduce greenhouse gas emissions. Only 12 percent of respondents said they would not support any of the proposed policies, a proportion consistent with Leiserowitz's (2005) estimate that 7 percent of the U.S. adult population are climate change ''naysayers.'' All the policies except a gasoline tax and a ''gas guzzler'' tax elicited a ''definitely yes'' or ''probably yes'' from a majority of respondents. In addition, over two-thirds of the sample believed that climate change would result in an increase in health problems and the

Table 4, Extended

	NEP	Future Orient	Altruis	Egoistic	Tradition	Openness Change	Mater Value	Postmat Value
Age	−.04(−.00)	.04 (.00)	.06 (.00)	−.01(−.00)	.09 (.00)	−.01 (−.00)	.10 (.00)	.11 (.00)
Educ	.08 (.02)	.05 (.01)	−.05(−.01)	.06 (.02)	−.02 (−.00)	.19 (.06)**	−.20(−.02)*	−.17(−.04)*
Male	−.06(−.08)	−.09(−.10)	−.11(−.17)*	.19(.29)**	−.17 (−.19)***	.05 (.08)	−.17(−.12)*	−.12 (−.13)
White	−.02(−.00)	−.11(−.01)	−.10(−.01)	−.01(−.00)	−.12 (−.01)	−.03 (−.00)	−.01(−.00)	−.09 (−.01)
VA	.07 (.09)	.10 (.11)*	.06(.09)	.05 (.07)	.03 (.04)	.03 (.05)	.02 (.01)	.12 (.14)
Liberal	.26(.11)***	.21(.07)**	.40(.19)***	−.06(−.03)	−.17 (−.06)**	.21 (.11)***	−.10(−.02)	.25(.09)***
Incom	−.08(−.05)	.15(.08) (p=.053)	−.13(−.09)*	−.08(−.06)	−.01 (−.00)	−.04 (−.03)	−.06(−.02)	−.04 (−.02)
Altruis	.42(.39)***	—	—	—	—	—	—	—
Egois	−.01(−.00)	—	—	—	—	—	—	—
Op chg	−.08(−.07)	—	—	—	—	—	—	—
Tradit	−.16(−.19)**	—	—	—	—	—	—	—
Mater	.17 (.34)	—	—	—	—	—	—	—
Posmat	−.13(−.15)	—	—	—	—	—	—	—
Fut or	.25(.33)**	—	—	—	—	—	—	—
NEP	—	—	—	—	—	—	—	—
En trus	—	—	—	—	—	—	—	—
Gov tr	—	—	—	—	—	—	—	—
Ind tr	—	—	—	—	—	—	—	—
#sourc	—	—	—	—	—	—	—	—
Ex inf	—	—	—	—	—	—	—	—
AC	—	—	—	—	—	—	—	—
MR^2	.44	.12	.20	.05	.06	.09	.11	.13

number of species lost, while just over half believed climate change would have a negative impact on people's standard of living. Despite general support for at least some policies and general recognition that climate change will have negative effects on people and other species, 43 percent agreed that ''claims about climate change are exaggerated'' and 39 percent believed it is too costly for the U.S. to reduce the use of fossil fuels (these survey items were not analyzed further in this paper). Therefore, while there is some recognition of the importance of acting to mitigate the effects of climate change, there is also evidence that not all the public is convinced about climate change's negative effects and the need to act. As with Leiserowitz's (2005) analysis of ''interpretative communities'' around climate change, we find considerable variation in the views of the public. These results indicate the need to further mobilize the public to identify global warming as an important public issue if increased public support for policies is to lead action to reduce the burning of fossil fuels.

Table 5. Direct, Indirect, and Total Effects of Model Components on Policy Support

	Direct Effects	Indirect Effects	Total Effects
Age	.18	−.07	.11
Education	−.07	.04	−.03
Male	.00	−.10	−.10
White	−.21	.03	−.18
VA (v. MI)	.09	.10	.19
Politically liberal	.08	.37	.45
Income	.13	−.02	.11
Altruism	−.13	.38	.25
Egoism	−.01	.04	.03
Open-to-change	.04	−.02	.02
Traditionalism	−.02	−.13	−.15
Materialism	−.13	.03	−.10
Post materialism	.19	−.09	.10
Future orientation	.03	.23	.26
NEP	.08	.13	.21
Environmental trust	.38	−.01	.38
Governmental trust	.13	−.00	.13
Industrial trust	−.30	.02	−.28
# climate change sources	−.04	.01	−.02
Extent informed	−.04	.01	−.04
Awareness consequences	.25	.00	.25

This study points to several factors that affect support for policies to reduce the burning of greenhouse gas emissions and provides strong support for our proposed causal model, explaining two-thirds of the variance in policy support. Findings indicated that trust was one of the most significant predictors of policy support. Interestingly, trust in government agencies did not relate to support but greater trust in environmental scientists and environmental groups and less trust in industry were associated with stronger support. This points to the important role environmental groups can play in enhancing public support for policies to mitigate the effects of climate change. These results are consistent with the risk perception literature, which argues that individuals may rely on their trust in institutions when making decisions regarding scientific issues about which they do not have considerable knowledge. This relationship between trust and climate change policies merits further attention among researchers since trust has not previously been investigated in relation to climate change policy preferences.

Consistent with Schwartz's norm activation theory, individuals with stronger beliefs about the consequences of climate change to people

and other species had greater support for climate change mitigation policies. Bivariate results (not presented) indicated that a higher personal norm for action was also strongly associated with greater policy support (r=0.62). Our measures of NEP and PN were so highly correlated that their unique effects on policy support could not be disentangled.

Findings also provide support for the ''values-beliefs-norms'' model. Once worldviews and AC were added to the multivariate model, values no longer had direct effects on policy support, but had substantial indirect effects. With the exception of openness-to-change, values influenced various worldviews (NEP or trust) and AC, which were in turn associated with support for the climate change related policies. A longer temporal orientation was also highly indirectly predictive of policy support.

Contrary to expectations, climate change information and material and postmaterial values did not exert direct or indirect effects on policy support. In terms of climate change information, it may not be the number of sources of information or self-rated knowledge that relate to policy preferences but rather individuals' actual knowledge about climate change (O'Connor et al. 1999), which was not tested in this study. Furthermore, our questions about climate change information did not allow us to assess the type and quality of the information respondents received from media sources. As discussed in the introductory section, media sources present conflicting information about the causes and extent of climate change. Given the efforts to shape information about climate change in the mass media, the role of beliefs about climate change warrants further investigation.

Social structural characteristics alone accounted for one-quarter of the variance in policy support. People earning more income had greater support for the climate change policies, which would impose financial costs on American households. Interestingly, political orientation was strongly associated with policy support, although the effect was indirect, as political orientation related to people's values and worldviews. This seems consistent with the finding by Dunlap and colleagues (2001) that social and economic ideology, as well as political ideology, matter in shaping support for the environmental movement. In contrast to prior research, older adults expressed more support for the policies than younger individuals, and education did not have an effect.

These results are consistent with previous applications of the VBN theory: core values and general beliefs play an important role in

shaping more specific responses to environmental problems. The relative lack of impact of knowledge and information is discouraging, perhaps. But it may be that the drift of pubic debate on climate change away from the state of the science (Dispensa and Brulle 2003; McCright and Dunlap 2000, 2003) has encouraged the public to ''tune out'' the debate. Clearly the relatively high level of concern with the issue is distinct from the messages offered by ''climate skeptics.'' Our respondents expressed reasonable support for policies to mitigate greenhouse gas emissions, and were more supportive of the policies that they considered less personally burdensome. While our study was not designed to look explicitly at willingness to pay, we suspect that a cost calculation in a narrow sense did not drive our respondents' choices. Three of our items offered respondents numbers that can be translated directly into an annual household cost estimate (an energy tax, tough regulations on coal, a federal subsidy for alternative energies). Two others, in which added car costs were mentioned, can also be translated into an annual cost if one makes an assumption about the average life a family car. While these calculations are imprecise compared to what could be derived from a willingness to pay study, there is no correlation between the percent supporting a policy and its cost ($r = -0.08$). This is consistent with the idea that support for these policies is driven more by deeply held values and general beliefs conditioned on a rough estimate of how much burden a measure would place on their household, rather than with a strict rational choice calculus.

Brewer (2005) has argued that there is a substantial distance between the policies that the American public would support on climate change and those being proposed by much of the national leadership. As we have noted above, there is also a disjuncture between the views expressed by many members of the national policy elite and the scientific consensus (Dispensa and Brulle 2003; McCright and Dunlap 2000, 2003). In the policy system, both scientific expertise and public opinion are resources, and they are often used to oppose one another (Dietz, Stern, and Rycroft 1989). On the issue of climate change we may be seeing an alignment of both of these resources in a position that contradicts a large part of the policy elite in the United States. This alignment may emerge around other issues, though perhaps in less dramatic ways, and may lead to a change in the dynamics of the struggle over environmental policies.

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