The Impact of Candidates' Statements about Climate Change on Electoral Success in 2010: Experimental Evidence

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Abstract

More than a decade of national surveys suggest that the vast majority of Americans who attach personal importance to the issue of climate change take what might be called "green" positions on that issue – endorsing the existence of warming, human causation, and the need for ameliorative action. This finding suggests that candidates running for office can gain votes by taking green positions and might lose votes by expressing skepticism about climate change. This paper describes tests of these hypotheses in experiments embedded in a national survey and in surveys carried out in three states with representative samples of adults. Among Democratic and Independent respondents, a hypothetical Senate candidate gained votes by taking a green position and lost votes by taking a not-green position. Taking a green or not-green position on climate change had no significant impact on the voting behavior of Republican citizens. The effects of taking green and not green positions were larger among people who believed in anthropogenic warming than among people who did not, and the effects were stronger among people who attached more personal importance to the issue. These results suggest that by taking a green position on climate, candidates of either party can gain votes.

The Impact of Candidates' Statements about Climate Change on Electoral Success in 2010: Experimental Evidence

According to surveys we have conducted since the late 1990s, large majorities of Americans have believed that the earth's temperature has been gradually increasing over the last 100 years, have believed that such warming is at least partly human-caused, and support government action to reduce future emissions of greenhouse gasses (what might be called a set of "green" opinions). For example, in a national survey in June 2010, 74 percent of respondents said they believed climate change had been occurring, 76 percent favored federal government limitations on greenhouse gas emissions generated by businesses, and 84 percent favored the federal government offering tax breaks to encourage utilities to make more electricity from water, wind, and solar power.[1]

These large majorities might seem to suggest that political candidates could gain votes by staking out green positions on climate change and that taking not-green positions could cause candidates to lose votes. But that is not how voting works – a policy issue like climate change does not typically influence the votes of all citizens. Instead, only people who are in what political scientists call the climate change "issue public"— people who pay close attention to the issue and consider it to be extremely or very important to them personally — are likely to base their votes on this issue. Among the 108 million American members of the climate change issue public, gigantic majorities take green positions, according to our past surveys. And this does in fact suggest that candidates may be able to win votes by taking green positions on climate and may lose votes by taking non-green positions.

[1] http://woods.stanford.edu/research/americans-support-govt-solutions-global-warming.html

This report describes experiments we conducted to test these hypotheses. To do so, we conducted experiments embedded in surveys of representative samples of American adults in three states (Florida, Maine, and Massachusetts) in July, 2010, and an expanded version of the experiment in a national survey in November, 2010. In both experiments, telephone interviewers read quotes from a hypothetical candidate running for Senate in the respondent's state, and the respondent indicated the likelihood that he or she would vote for the candidate. All respondents heard the candidate take positions on a series of issues other than climate change. For some respondents, the candidate took no position on climate. Other respondents heard the candidate take a green position on climate. And, in the national survey only, some respondents heard the candidate take a non-green position on climate. This experimental design allowed us to assess the impact of adding a statement on climate change to a candidate's utterances.

Study 1 – National Survey

Experimental methods are routinely employed in the social sciences to generate evidence of causal influence. The ideal research design in this context would be an experiment in which real candidates are randomly assigned to take a green position, a not-green position, or no position on climate change. The difference between the votes received by the three groups of candidates could then be interpreted as the causal effect on Americans' voting of candidate's position-taking. Such an experiment could never be conducted in a real election (because candidates would no doubt resist having their positions on climate be randomly assigned to them), but experiments with hypothetical elections can be embedded in national surveys, as we have done.

We used the experimental data to answer two principal questions. First, we assessed the impact of taking green and not-green positions on voting likelihood. Second, we assessed whether the impact of taking green or not-green positions on climate varied across Democratic,

Independent, and Republican respondents. Past surveys of ours and other investigators suggest that in recent years, Democrats and Independents have been more likely to take green positions on climate than have Republicans. Although majorities of Republicans have expressed green positions, those are slight majorities rather than the huge majorities apparent among Democrats and Independents. We therefore expected that taking a green position would attract votes for a candidate among Democrats and Independents and that taking a not-green position would reduce votes gained from Democrats and Independents. But, *a priori*, we were uncertain about the impact that taking green and not-green positions would have on Republicans.

Data

Data Collection During telephone interviews with a representative sample of American adults, respondents heard quotes from a hypothetical candidate running for Senate and then reported how likely they were to vote for or against the candidate. Each respondent was randomly assigned to hear the candidate take a green position on climate, take a not-green position on climate, or take no position on climate.

The survey interviews were conducted by Abt SRBI, who spoke with 1,001 U.S. adults, including 671 respondents interviewed on a landline telephone and 330 interviewed on a cell phone. Interviews were conducted between November 1 and November 14, 2010, and were administrated in English and Spanish.

Samples were drawn from both landline and cellular random digit dial (RDD) frames to represent people with access to either a landline or cell phone. Both samples were provided by Survey Sampling International, LLC, according to specifications from Abt SRBI. Numbers for the landline sample were drawn with equal probabilities from active blocks (area code + exchange + two-digit block number) that contained one or more residential directory listings. The cellular sample was drawn through a systematic sampling from 1000-blocks dedicated to

cellular service according to the Telcordia database.

A maximum of seven call attempts were made to each sampled telephone number. Refusal conversion was attempted on soft refusal cases in the landline sample. Calls were staggered over times of day and days of the week to maximize the chance of making contact with potential respondents. The sample was released for interviewing in replicates, which are representative subsamples of the full sample.

For the landline sample, the respondent was randomly selected from among all of the adults living in the household. In households with two adults, one adult was randomly selected. In households with three or more adults, a first random selection was made to choose between the adult who answered the phone and the rest of the adults, and if the remaining adults were selected, one was randomly chosen using the last or next birthday method (whereby the adult with the most recent or the upcoming birthday was selected for interviewing; the use of next vs. last birthday for each household was determined randomly). For the cell phone sample, interviews were conducted with the person who answered the phone. Interviewers verified that the person was an adult and in a safe place before administering the survey. Cell phone sample respondents were offered a post-paid reimbursement of $10 for their participation.

Abt SRBI created a base weight that adjusts for differential probabilities of selection due to the number of adults in the household, the number of voice-use landlines, and the number of cell phones. The base weight also adjusts for overlap of the landline and cell phone RDD frames. We computed a final weight using a raking algorithm[2] that accounted for unequal probabilities of

[2] DeBell, Matthew, and Jon A. Krosnick. 2009. Computing Weights for American National Election Study Survey Data. ANES Technical Report series, no. nes012427. Ann Arbor, MI, and Palo Alto, CA: American National Election Studies. Available at http://www.electionstudies.org

Pasek, J. (2010). anesrake: ANES Raking Implementation. Comprehensive R Archive Network. Version 0.4 [July 12, 2010]. Available from: http://cran.r-project.org/web/packages/anesrake/index.html.

selection and post-stratified to population proportions of age, sex, education, ethnicity, race, and Census region, using targets from the September 2010 Current Population Survey conducted by the U.S. Census Bureau. The weighting combined the interviews done on landlines and cell phones taking into account the rates of landline and cell phone usage documented by the 2009 National Health Interview Survey. The AAPOR Response Rate 3 was 17%.

Table 1 displays distributions of unweighted and weighted demographics from the survey and national benchmarks from the 2010 March supplement of the Current Population Survey. These distributions show that the sample was similar to the American population before the weights were applied and, as expected, was more similar after the data were weighted. The weighted sample slightly over-represented females and people with some college or college graduates or more education and slightly under-represented Hispanics and people with some high school education but no high school degree, as well as high school graduates.

We report weighted results of the experiment, though unweighted data produced comparable findings.

Experimental Conditions In this experiment, all the respondents heard two or three issue statements made by the hypothetical Senate candidate and then answered this question: "Now based on all these things that you have heard the candidate say, how likely do you think you would be to vote for this candidate in an election for U.S. Senate? Do you think you definitely would vote for this candidate, probably would vote for this candidate, probably would not vote for this candidate, or definitely would not vote for this candidate?"

Respondents were randomly assigned to one of three groups: control, green, and not-green. Respondents in each group heard two "control" issue statements, which were randomly selected from six issue statements that are listed in Appendix A. After hearing each statement,

respondents were asked, “Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it?”

Respondents who were randomly assigned to be in the green group heard an additional statement in which the candidate took a green position on climate change, with a random half of these green group respondents hearing the green statement prior to, and the other half hearing it after the two control issue statements. After hearing the green statement, respondents indicated whether they mostly agreed, mostly disagreed, or neither agreed nor disagreed with the statement. The green statement was:

> “Like most Americans and most of the residents of our great State, I believe that global warming has been happening for the last 100 years, mainly because we have been burning fossil fuels and putting out greenhouse gasses. Now is the time for us to stop this by ending our dependence on imported oil and coal to run our cars and heat our houses. We need to begin using new forms of energy that are made in America and will be renewable forever. We can build better cars that use less gasoline. We can build better appliances that use less electricity. And we can make power from the sun and from wind. We don’t have to change our lifestyles, but we do need to reshape the way our country does business. We need to end our long-term addiction to polluting the environment and instead let American genius do what it does best – transform our outdated ways of generating energy into new ones that create jobs and entire industries, and stop the damage we’ve been doing to the environment.”

Respondents in the not-green group heard the candidate take a not-green position on climate change, with a random half of them hearing the not-green statement prior to, and the other half hearing it after the two control issue statements. After hearing the not-green statement,

respondents indicated whether they mostly agreed, mostly disagreed, or neither agreed nor disagreed with the statement. The not-green statement was:

> "There isn't any real science to say we are changing the climate of the earth. The science on global warming is a hoax and is an attempt to perpetrate a fraud on the American people. Climate science is junk science, and global warming is a manufactured controversy. I don't buy into the whole man-caused global warming, man-caused climate change mantra, and I believe that there's not sound science to back that up. We must spend no effort to deal with something that is not a problem at all. Yet that's exactly what's happening with the cap and trade bill that Congress has considered. I oppose the cap and trade bill. Cap and trade is a job killer and damages our economy. We should not invest in windmills and solar panels as alternative energy sources. Instead we should continue to focus on our traditional sources of energy: coal, oil, and natural gas. We should expand energy production in our country, including by continuing to mine our coal, doing more drilling for oil here at home." [3]

Results

The Effects of Green and Not-Green Statements In the full sample, taking a green position on climate won votes for the candidate, and taking a not-green position lost votes (see row 1 of Table 2). 65% of respondents said they would vote for the candidate who was silent on climate change, whereas 77% said they would vote for the candidate who took a green position on climate change. This 12-percentage point increase was statistically significant (p = .01). Among respondents who heard the candidate take a not-green position on climate, only 48% said

[3] Due to a communication error, there was a revision of the list of non-climate related issue statements. This change was introduced after 193 interviews had been completed between November 1 and 3, 2010. These 193 interviews were excluded from the analysis, resulting in a sample size of N = 808.

they would vote for him/her. The 17-percentage point difference between this number and the control group's number was also statistically significant ($p < .01$).

Moderation by Party Identification As expected, the same impact of the green and not-green statements was apparent among Democratic respondents (see row 2 of Table 2).[45] 53% of Democrats said they would vote for the candidate who was silent about climate change, whereas 74% said so when the candidate took a green position, a 21 percentage point increase ($p = .03$). In contrast, 37% of Democrats said they would vote for the candidate who took a not-green position, a decline of 16 percentage points from the silent candidate ($p = .07$).

Independents closely resembled Democrats. 63% of Independents said they would vote for the candidate who was silent about climate change, and 79% said so about the candidate who took a green position, an increase of 15 percentage points ($p = .02$). When the candidate took a not-green position, 44% of Independents said they would vote for him/her, a decrease of 19 percentage points ($p = .01$).

Among Republicans, taking a green position caused a small and non-significant decline in intentions to vote for the candidate (83% for the candidate silent on climate vs. 78% for the candidate who took a green position, $\Delta=6\%$, $p = .43$). Taking a not green position also caused a small and non-significant decline in the intentions to vote for the candidate (83% vs. 76%, $\Delta=7\%$, $p = .38$).

[4] The question for party identification, with identical wording for the national and state surveys, is "Do you consider yourself a Democrat, a Republican, an Independent, or none of these?" Respondents who answered with "Democrat" and "Republican:" were coded as "Democrats" and "Republicans", respectively, and the remaining respondents were coded as "Independents".

[5] We report one-tailed tests for the effects among Democrats and Independents given our strong expectations of the directions of effects. We report two-tailed tests for the Republicans because we had no such expectations.

Study 2 –Surveys in Florida, Maine and Massachusetts

Our second study used a similar experimental approach to assess the impact of only green statements on vote intentions among residents of Florida, Maine, and Massachusetts.

Data

Data Collection During telephone interviews with representative samples of adults in Florida (N=600), Massachusetts (N=600), and Maine (N=600), interviewers read quotes from a hypothetical candidate running for Senate and then asked respondents how likely they were to vote for or against the candidate. Each respondent was randomly assigned to hear the candidate take no position on climate or to take a green position on climate.

The interviews were conducted by Abt SRBI between July 9 and July 18, 2010. In each state, approximately 400 respondents were interviewed on a landline telephone, and approximately 200 were interviewed on a cell phone. Interviews were conducted in English and Spanish.

The target population for the study is non-institutionalized persons age 18 and over, living in Florida, Massachusetts, and Maine. Samples were drawn from both the landline and cellular random digit dial (RDD) frames provided by Survey Sampling International, LLC according to Abt SRBI specifications. Numbers for the landline sample were drawn with equal probabilities from active blocks (area code + exchange + two-digit block number) that contained one or more residential directory listings. The cellular sample was drawn through a systematic sampling from 1000-blocks dedicated to cellular service according to the Telcordia database.

A maximum of seven call attempts were made to numbers in the landline and cell phone samples. Refusal conversion was attempted on soft refusal cases in the landline sample. Calls were staggered over times of day and days of the week to maximize the chance of making contact with potential respondents. The sample was released for interviewing in replicates.

For the landline sample, the respondent was randomly selected from all of the adults in the household. For the cell phone sample, interviews were conducted with the person who answered the phone. Interviewers verified that the person was an adult and in a safe place before administering the survey. Cell sample respondents were offered a post-paid reimbursement of $5 for their participation.

Weights for the July 2010 surveys done in Florida, Maine, and Massachusetts account for unequal probabilities of selection, and post-stratify to population proportions of age, sex, education, ethnicity and race, using targets from the 2006-2008 American Community Survey for Florida, Maine, and Massachusetts. The weighting was also designed to combine interviews done on landlines and cell phones taking into account the rates of landline and cell phone usage from the NHIS. More details about the methodology about the survey and the experiment are available elsewhere[6].

AAPOR Response Rate 3 was 15% for the landline samples in the three states combined, and 14%, 14% and 19% for the landline samples of the state of Florida, Massachusetts, and Maine, respectively. AAPOR Response Rate 3 was 10% for the cell phone samples in the three states combined, and 10%, 9% and 12% for the landline samples of the state of Florida, Massachusetts, and Maine, respectively.

Tables 3-5 display distributions of unweighted and weighted demographics of each of the three states' survey samples along with a state-level benchmark computed using data from the 2006-2008 American Community Survey for the three states. The unweighted samples under-represented younger adults, under-represented whites, and under-represented people with relatively little formal education. After weighting, the three samples closely resembled their

[6] http://woods.stanford.edu/research/state-surveys.html

corresponding populations.

Experimental Conditions In this survey experiment, all the respondents heard two or three issue statements made by the hypothetical candidate running for Senate and then answered this question: "Now based on all these things that you have heard the candidate say, how likely do you think you would be to vote for this candidate in an election for U.S. Senate? Do you think you definitely would vote for this candidate, probably would vote for this candidate, probably would not vote for this candidate, or definitely would not vote for this candidate?"

Respondents were randomly assigned to one of the two groups: control and green. Respondents first heard two issue statements, listed in Appendix B, which were identical in the two groups. The respondents in Florida heard one statement on Cuba and one on terrorism. The respondents in Massachusetts heard one statement on terrorism and one on health care. The respondents in Maine heard one statement on terrorism and one on the economy. After hearing each of the two statements, respondents were asked, "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it?"

Respondents who were randomly assigned to the green group heard an additional statement in which the candidate took a green position about climate change. After the statement was read, these respondents indicated whether they mostly agreed with it, mostly disagreed, or neither agreed nor disagreed with the statement. The green statement is identical to that used in Study 1.

Results

The Effect of the Green Statement In each state, taking a green position on climate change won votes for the candidate (see Table 6). In Florida, 49% of respondents said they would vote for the candidate who was silent on climate, whereas 73% said they would vote for the candidate who took a green position on climate. This 24-percentage point increase was

statistically significant ($p < .01$). The same effect was apparent among respondents in Maine and Massachusetts but with smaller magnitudes. In Maine, 64% of respondents said they would vote for the candidate who took no position on climate, but 71% said so for the candidate who took a green position on climate, an increase of 7 percentage points ($p = .08$). In Massachusetts, the effect was about 10 percentage points ($p = .02$); 67% and 77% of respondents said they would vote for the candidate who took no position on climate change and a green position climate change, respectively. IS

Moderation by Party Identification As expected, the impact of the green statement was apparent among Democratic respondents (see row 4 of Table 6). 58% of Democrats said they would vote for the candidate who was silent about climate, whereas 83% said so about the candidate who took a green position, a 25 percentage point increase ($p < .01$). Likewise, 57% of Independents said they would vote for a candidate who was silent about climate change, whereas 71% said so about the candidate who took a green position, an increase of 14 percentage points ($p < .01$). Among Republicans, taking a green position caused a small and non-significant decline in intentions to vote for the candidate (71% for the candidate silent on climate vs. 63% for the candidate who took a green position, Δ=8%, $p = .34$).

Moderation by Belief in Anthropogenic Warming and by Personal Importance

We expected that the gains and losses of votes resulting from taking a green position or a not-green position, respectively, would be more pronounced among respondents who believed that climate change was real and human-caused than among Americans who denied the existence of anthropogenic warming. Furthermore, the attitude strength literature suggests that these gains and losses should have been more pronounced among people who attached more personal

importance to the issue (Visser, Bizer, & Krosnick, 2006). To test these hypotheses, we pooled the data from the national survey and the state surveys to yield sufficiently large samples (see Appendix C for the measures of belief in anthropogenic warming and of issue public membership).

Moderators of the Green and Not-Green Statement Effects

Belief in Anthropogenic Warming As expected, the impacts of the green and not-green statements were much more pronounced among respondents who believed that the Earth's temperature has been rising and that the temperature increase has been due to things people did than among respondents who did not hold these beliefs (see rows 1-2 of Table 7). 63% of respondents who believed in anthropogenic warming said they would vote for the candidate who was silent about climate, whereas 80% said so about the candidate who took a green position, a 17 percentage point increase ($p < .00$). Among respondents who did not believe in anthropogenic warming, taking a green position caused a small and non-significant increase in intentions to vote for the candidate (57% for the candidate silent on climate vs. 64% for the candidate who took a green position, Δ=7%, $p = .11$). Likewise, 40% of respondents who believed in anthropogenic warming said they would vote for the candidate who made a not-green statement, a 24 percentage point decline as compared to the silent candidate ($p <.00$), whereas making a not-green statement caused a small and insignificant increase in intentions to vote for the candidate among respondents who did not believe in anthropogenic warming (62% for the candidate who took a not-green position, Δ=5%, $p = .53$).

Personal Importance As expected, the impact of the green and not-green statements was greater among respondents who attached more personal importance to the issue (see rows 3-4 of Table 7). 60% of high importance respondents said they would vote for the candidate who was silent about climate change, whereas 78% said so about the candidate who took a green position,

an 18 percentage point increase ($p < .00$). Among respondents low in personal importance, taking a green position caused a much smaller increase in intentions to vote for the candidate (62% for the candidate silent on climate vs. 71% for the candidate who took a green position, Δ=9%, p <.00). Likewise, 38% of the high personal importance group said they would vote for the candidate who made a not-green statement, a 22-percentage point decline as compared to the candidate who was silent (p <.00). In contrast, making a not-green statement caused a small and insignificant decrease in intentions to vote for the candidate among respondents who were low in personal importance (58% for the candidate who took a not-green position, Δ=-4%, p = .45).

Evaluations of the Candidate's Green and Not-Green Statements

Consistent with earlier research indicating that a large majority of Americans believed in anthropogenic warming and supported ameliorative government action, 78% of respondents said they mostly agreed with the candidate's green statement. Also consistent with earlier surveys, this proportion varied significant by party identification ($p < .00$). It was 86% among Democrats, 64% among Republicans, and 79% among Independents. And as expected, even a majority of Republicans mostly agreed with the green statement.

Consistent with past surveys, a small minority, 22%, of respondents said that they mostly agreed with the candidate's not-green statement, and this proportion varied by party identification: 44% of Republicans and 23% of Independent respondents said they mostly agreed with the not-green statement, whereas only 10% of Democrats said so ($p < .00$). Thus, disagreement with the not-green statement was more common than agreement, even among Republicans.

As expected, evaluations of the candidate's climate change statement varied according to the respondents' beliefs about global warming. 89% of people who believed in anthropogenic

warming agreed with the green statement, whereas 59% of people who did not believe in anthropogenic warming did so ($p < .00$). 14% of people who believed in anthropogenic warming agreed with the not-green statement, whereas 37% did so among people who did not believe in anthropogenic warming ($p < .00$). Thus, even among people who thought that gradual warming probably has not been occurring or that warming is not due to human action, a majority disagreed with the candidate's not-green statement.

Conclusions

These two studies yielded experimental evidence from representative national and regional samples of American adults suggesting that Congressional candidates' climate positions influence Americans' voting behavior. Candidates who took a green position gained votes, and candidates who took a not-green position lost votes. Confidence in these conclusions is justified by the fact that supportive results were obtained in four separate tests.

These findings lend credibility to our earlier surveys that used different methods to ascertain the attitudes and beliefs of Americans and to gauge the likely impact of these attitudes and beliefs on voting. We concluded from many studies that the vast majority of climate change issue public members took green positions on the issue. This led us to expect exactly the effects shown in the present study. Had these effects not been observed, we would have had reason to doubt the validity of our past surveys' measurements. Therefore, the confirmation here of expected effects reinforces the portrait of public opinion that those past surveys painted.

The present findings have interesting implications for candidates' campaign strategies. If we first assume that elections will be won and lost mostly by attracting the votes of Independent citizens whose votes cannot be predicted by their party affiliations, our results suggest that candidates would do best to take green positions and would hurt their electoral chances by taking not-green positions. Furthermore, the pattern of effects we observed among

Democratic citizens suggests that candidates trying to capture a Democratic Party nomination or to inspire Democratic citizens to vote for them in general elections would be best off expressing a green position on climate. Interestingly, Democratic candidates wishing to woo Republican voters during general elections apparently have nothing to gain or lose by the positions they take on climate, leaving them free to take green positions in order to attract Independents and perhaps to inspire Democrats to participate in the election.

According to our results, Republican candidates have even more to gain by taking green positions on climate. In addition to helping to attract Independent voters, Republican candidates who take green positions may have some success wooing Democratic citizens in general elections, especially if their Democratic opponents remain silent on climate. Furthermore, taking a green position on climate will apparently not hurt a Republican's standing with Republican voters, so this seems like a cost-free strategy. Consequently, Republican candidates are apparently free to take green positions even during primaries, perhaps thereby attracting early attention from Independent and Democratic citizens. Thus, according to our results, Republican candidates stand a good chance of gaining votes by taking green positions and should certainly not take not-green positions.

It is important to note that the studies reported here have some limitations. First, because our analyses did not focus on the opinions of only likely voters, caution about generalizing our results on all citizens to voters in particular is merited. Furthermore, we measured stated intentions to vote rather than observing actual voting behavior, though stated voting intentions are excellent predictors of actual voting behavior (e.g., Visser, Krosnick, Marquette & Curtin, 1996). Another caution involves the fact that the hypothetical candidates took positions on just a few issues during a short period of time. Since real candidates take positions on many more

issues, and because voters learn many other types of information about candidates, different influence might be observed in the course of a real election. We tested two specific versions of a green and not-green statement – different results might be obtained with other statements.

And in our simulated election, we only described a single candidate, whereas contests normally involve competing candidates. Perhaps most importantly, we did not examine what would happen in voters' minds if a candidate took a green or not green position and was then attacked by his or her opponent for doing so, which could certainly be studied in future experiments. It is conceivable that a candidate who takes a not-green position and is then attacked for doing so by his or her opponent would fare even worse with voters than a candidate who simply takes a not-green position that goes unchallenged. And perhaps a candidate who takes a green position would gain even more votes if his or her opponent attacked that position by taking a not-green position. We look forward to future studies exploring these possibilities.

In the meantime, these results suggest what might be winning strategies for candidates running for office.

References

Visser, P. S., Bizer, G. Y., & Krosnick, J. A. (2006). Exploring the latent structure of strength-related attitude attributes. In M. Zanna (Ed.), Advances in Experimental Social Psychology. New York, NY: Academic Press.

Visser, P. S., Krosnick, J. A., Marquette, J., & Curtin, M. (1996). Mail surveys for election forecasting? An evaluation of the Columbus Dispatch poll. Public Opinion Quarterly, 60, 181-227.

Table 1: Demographics of the GW National Survey and Current Population Survey

	GW National Survey Nov 2010 (unweighted)	GW National Survey Nov 2010 (weighted)	CPS March 2010	Difference: GW National Survey (weighted) – CPS
Gender				
Male	45.9%	46.7%	48.5%	-1.8%
Female	54.1	53.3	51.5	1.8
Total	100.0%	100.0%	100.0%	
	(N = 808)	(N = 808)	(N = 149,071)	
Age				
18-24	9.9%	11.9%	12.8%	-0.9%
25-34	11.3	18.7	17.9	0.8
35-44	13.4	17.4	17.6	-0.2
45-54	21.2	19.0	19.4	-0.4
55-64	18.0	16.0	15.4	0.6
65+	26.3	16.9	16.8	0.1
Total	100.0%	100.0%	100.0%	
	(N = 769)	(N = 769)	(N = 149,071)	
Ethnicity				
Hispanic	11.0%	12.6%	13.9%	-1.3%
Non-Hispanic	89.0	87.4	86.1	1.3
Total	100.0%	100.0%	100.0%	
	(N = 779)	(N = 779)	(N = 149,071)	
Race				
White only	74.0%	81.6%	81.0%	0.6%
Black only	9.9	12.1	11.9	0.2
Other race	16.1	6.3	7.1	-0.8
Total	100.0%	100.0%	100.0%	
	(N = 808)	(N = 808)	(N = 149,071)	
Education				
HS but no degree	6.9%	10.5%	13.7%	-3.2%
HS graduates	25.9	29.8	31.1	-1.7
Some college	24.9	30.2	27.9	2.3
College or higher	42.4	29.5	27.3	2.2
Total	100.0%	100.0%	100.0%	
	(N = 788)	(N = 788)	(N = 149,071)	
Region				
Northeast	18.3%	17.8%	18.4%	-0.6%
Midwest	23.9	22.8	21.8	1.0
South	36.5	35.2	36.7	-1.5
West	21.3	24.2	23.1	0.8
Total	100.0%	100.0%	100.0%	
	(N = 808)	(N = 808)	(N = 149,071)	

Table 2: Effects of Green and Not-Green Statements on Predicted Voting for the Candidate in the National Survey

	Percent of Respondents Who Would Vote for the Candidate				
	Respondents who heard no statement on climate change (1)	Respondents who heard the green statement (2)	Respondents who heard the not-green statement (3)	Effect of the green statement (2) - (1)	Effect of the not-green statement (3) - (1)
Full sample	65.2% (N=266)	77.4% (N=266)	47.9% (N=276)	12.2%**	-17.4%***
Democrats	53.0% (N=77)	74.3% (N=76)	37.4% (N=97)	21.3%**	-15.5%*
Republicans	83.4% (N=71)	77.8% (N=68)	76.4% (N=59)	-5.6%	-7.1%
Independents	63.3% (N=118)	78.8% (N=122)	43.9% (N=120)	15.4%**	-19.5%**

Note: Ns appear in parentheses under the percentages.

***: $p < .01$, **: $p < .05$, *: $p < .10$.

Table 3: Demographics of the GW State Survey and American Community Survey: Florida

	Florida State Survey July 2010 (unweighted)	Florida State Survey July 2010 (weighted)	Florida ACS 2006-8	Difference: Florida State Survey (weighted) – ACS
Gender				
Male	48.8%	49.4%	48.5%	0.9%
Female	51.2	50.6	51.5	-0.9
Total	100.0% (N = 600)	100.0% (N=600)	100.0% (N=150,777)	
Age				
18-24	6.8%	11.3%	11.3%	0.0%
25-34	10.0	15.9	15.9	0.0
35-44	13.0	17.9	17.9	0.0
45-54	20.7	18.2	18.2	0.0
55-64	20.8	14.9	14.9	0.0
65+	28.7	21.9	21.9	0.0
Total	100.0% (N = 571)	100.0% (N=571)	100.0% (N=150,777)	
Ethnicity				
Hispanic	13.3%	19.4%	19.4%	0.0%
Non-Hispanic	86.7	80.6	80.6	0.0
Total	100.0% (N = 579)	100.0% (N=579)	100.0% (N=150,777)	
Race				
White only	77.2%	80.2%	80.2%	0.0%
Black only	11.2	14.3	14.3	0.0
Other race	11.7	5.5	5.5	0.0
Total	100.0% (N = 574)	100.0% (N=574)	100.0% (N=150,777)	
Education				
HS but no degree	5.5%	15.5%	15.5%	0.0%
HS graduates	28.0	31.3	31.3	0.0
Some college	21.2	29.6	29.6	0.0
College or higher	45.3	23.6	23.6	0.0
Total	100.0% (N = 579)	100.0% (N=579)	100.0% (N=150,777)	

Table 4: Demographics of the GW State Survey and American Community Survey: Massachusetts

	Massachusetts State Survey July 2010 (unweighted)	Massachusetts State Survey July 2010 (weighted)	Massachusetts ACS 2006-8	Difference: Massachusetts State Survey (weighted) – ACS
Gender				
Male	48.3%	49.5%	47.7%	1.7%
Female	51.7	50.6	52.3	-1.7
Total	100.0% (N = 600)	100.0% (N=600)	100.0% (N=442,524)	
Age				
18-24	8.2%	13.1%	13.1%	0.0%
25-34	10.3	16.3	16.3	0.0
35-44	14.3	19.4	19.4	0.0
45-54	22.4	19.7	19.7	0.0
55-64	22.8	14.4	14.4	0.0
65+	22.1	17.1	17.1	0.0
Total	100.0% (N = 575)	100.0% (N=575)	100.0% (N=442,524)	
Ethnicity				
Hispanic	6.2%	7.1%	7.1%	0.0%
Non-Hispanic	93.8	92.9	92.9	0.0
Total	100.0% (N = 579)	100.0% (N=579)	100.0% (N=442,524)	
Race				
White only	85.4%	85.4%	85.4%	0.0%
Black only	6.2	6.6	6.3	0.3
Other race	8.4	8.0	8.3	-0.3
Total	100.0% (N = 577)	100.0% (N=577)	100.0% (N=442,524)	
Education				
HS but no degree	4.6%	11.7%	11.7%	0.0%
HS graduates	22.6	27.8	27.8	0.0
Some college	18.1	25.7	25.7	0.0
College or higher	54.7	34.8	34.8	0.0
Total	100.0% (N = 592)	100.0% (N=592)	100.0% (N=442,524)	

Table 5: Demographics of the GW State Survey and American Community Survey: Maine

	Maine State Survey July 2010 (unweighted)	Maine State Survey July 2010 (weighted)	Maine ACS 2006-8	Difference: Maine State Survey (weighted) – ACS
Gender				
Male	45.2%	47.8%	47.8%	0.0%
Female	54.8	52.2	52.2	0.0
Total	100.0% (N = 600)	100.0% (N=600)	100.0% (N=30,153)	
Age				
18-24	6.4%	10.7%	10.7%	0.0%
25-34	9.5	14.5	14.5	0.0
35-44	13.9	18.1	18.1	0.0
45-54	22.5	21.2	21.2	0.0
55-64	24.2	16.7	16.7	0.0
65+	23.5	18.9	18.9	0.0
Total	100.0% (N = 582)	100.0% (N=582)	100.0% (N=30,153)	
Ethnicity				
Hispanic	1.4%	2.0%	1.0%	1.0%
Non-Hispanic	98.6	98.0	99.0	-1.0
Total	100.0% (N = 583)	100.0% (N=583)	100.0% (N=30,153)	
Race				
White only	94.9%	97.5%	97.5%	0.0%
Black only	1.0	.7	.9	-0.2
Other race	4.1	1.8	1.6	0.2
Total	100.0% (N = 582)	100.0% (N=582)	100.0% (N=30,153)	
Education				
HS but no degree	6.7%	11.1%	11.1%	0.0%
HS graduates	26.3	36.1	36.1	0.0
Some college	21.0	29.2	29.2	0.0
College or higher	46.1	23.7	23.7	0.0
Total	100.0% (N = 586)	100.0% (N=586)	100.0% (N=30,153)	

Table 6: Estimations of the Green Effects and the Moderation of Party Affiliation in the States Survey

	Percent of Respondents Who Would Vote for the Candidate		
	Respondents who heard no statement on climate change (1)	Respondents who heard the green statement (2)	Effect of the green statement (2) - (1)
All respondents by state			
Florida	49.1% (N=297)	72.7% (N=302)	23.6%***
Maine	63.8% (N=278)	70.5% (N=318)	6.8%*
Massachusetts	67.2% (N=288)	76.9% (N=306)	9.7%**
Respondents from three states by party affiliation			
Democrats	58.18% (N=257)	83.03% (N=283)	24.9%***
Republicans	70.9% (N=157)	62.7% (N=162)	-8.1%
Independents	57.0% (N=449)	71.2% (N=481)	14.2%***

Note: Presented in columns (1)-(2) are the percent of who would vote for the candidates among respondents who did not hear any climate statement and who heard a green statement on climate, respectively, with Ns in parentheses indicating the number of observations in each cell.

***: $p < .01$, **: $p < .05$, *: $p < .10$.

Table 7: Moderators of the Effects of Green and Not-Green Statements on Predicted Voting for the Candidate

	Percent of Respondents Who Would Vote for the Candidate				
	Respondents who heard no statement on climate (1)	Respondents who heard the green statement on climate (2)	Respondents who heard the not-green statement on climate (3)	Effect of the green statement (2) - (1)	Effect of the not-green statement (3) - (1)
Believed in Anthropogenic Warming	63.1% (N=778)	79.7% (N=775)	39.6% (N=176)	16.6%***	-23.5%***
Did not Believe in Anthropogenic Warming	57.1% (N=369)	64.3% (N=410)	61.9% (N=100)	7.2%	4.8%
High Personal Importance	60.0% (N=559)	78.3% (N=528)	37.7% (N=125)	18.3%***	-22.3%***
Low Personal Importance	62.2% (N=588)	71.2% (N=657)	57.9% (N=151)	9.0%***	-4.3%

Note: Ns appear in parentheses under the percentages.

***: $p < .01$, **: $p < .05$, *: $p < .10$.

Appendix A: Issue Statements in the National Global Warming Survey, November, 2010

The follow questions were asked of all respondents when the issue statements unrelated to climate change were read to them. Respondents were asked "I'd like to read you a few things that a person running for U.S. Senate in your State might say. After you listen to each one, I'll ask you whether you mostly agree with it, mostly disagree with it, or neither agree nor disagree with it. First, what if the candidate said the following:"

A first issue statement, randomly selected from six non-climate statements, (the wording of these six statements is described below) was read to the respondent. Respondents were asked "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? "

Respondents were then asked "Next, what if the candidate said this:" A second issue statement, randomly selected from six non-climate statements, (the wording of these six statements is described below) was read to the respondent. Respondents were asked "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? "

Below are the six issues statements, from which two were randomly selected for each respondent:

1. Our nation remains a target for terrorists. Terrorists are unrelenting in their desire to kill Americans. We cannot let down our guard, and we must continue to meet this ongoing threat with strength and resilience. During the past eight years, significant resources have been devoted to the prevention of a terrorist attack using a biological, chemical, or nuclear weapon. But the improvised explosive device remains the weapon of choice for terrorists. And terrorists can also choose to use firearms. For many Americans, including many families

in our state, the right to own guns is part of their heritage and way of life. This right is protected by the Second Amendment. And so our government confronts a difficult issue today: how do we protect the constitutional right of Americans to bear arms, while preventing terrorists from using guns to carry out their murderous plans? None of us wants a terrorist to be able to purchase a gun. But neither should we want to infringe upon a constitutional right of law-abiding Americans.

2. It makes no sense that the capital and risk standards for our nation's largest financial institutions are more lenient than those that apply to smaller depository banks, when the failure of larger institutions is much more likely to have a broad economic impact. Yet that is currently the case. We must give the regulators the tools and the direction to address this problem. I have proposed an amendment that will strengthen the economic foundation of these firms, increase oversight and accountability, and help prevent the excesses that contributed to the deep recession that has cost millions of Americans their jobs. Increasing capital requirements as firms grow provides a disincentive to their becoming “too big to fail” and ensures an adequate capital cushion in difficult economic times.
3. When we are dealing with foreign-born suspects with known ties to terrorist organizations, and these people are carrying out plans to indiscriminately kill Americans, we need to NOT treat them like they’re common criminals. Treating these people like common criminals is dangerous, and it limits the intelligence information that we can gather from suspects. The suspected Christmas Day bomber could have provided valuable information about potential terror plots. Instead, he was charged in the civilian court system where he got a lawyer and stopped talking. When someone is given Miranda rights and access to a lawyer, gathering valuable information about possible terrorist plots is greatly diminished.

4. I believe that all Americans deserve quality, affordable health care, and that we must address the issues of rising health care costs and accessibility. Unfortunately, the recently enacted Federal health care legislation does not accomplish these goals and instead raises taxes on individuals and businesses, increases government spending, and will result in higher costs for consumers. I believe we must focus on fixing and replacing this law with common-sense health care reforms that drive down costs, make it easier for people to purchase affordable insurance, and strengthen the existing private market system.
5. I believe that terrorism is not a political issue; it is a national security issue. To win the war against terrorism, we must be able to quickly adapt to ever-changing terrorist tactics. Congress and the Administration must work together in a bipartisan fashion to continue support for all elements of national security, to increase information sharing and collective security efforts around the globe, and to expand vital law enforcement partnerships. Our Constitution and laws exist to protect this nation — they do not grant rights and privileges to enemies in wartime. In dealing with terrorists, our tax dollars should pay for weapons to stop them, not lawyers to defend them.
6. I am an unwavering proponent of the Second Amendment to the United States Constitution and the right it confers on the people to keep and bear arms. As such, any attempts to deny this right violate both the letter and spirit of our Constitution. Enforcement, not new gun control laws, is the answer. To address concerns of gun crimes and criminal possession of firearms, the answer is not to create laws that deny law abiding citizens the ability to defend themselves. Criminals will not be deterred by any such laws. Rather, the answer is proper and robust enforcement of appropriate gun laws now on the books. Furthermore, the proper way to combat crimes in our communities is to ensure that those who commit them are properly

arrested, convicted and incarcerated for their crimes.

Appendix B: Issue Statements in the States Global Warming Surveys, July, 2010

The follow questions were asked of all respondents in the state of Florida when the issue statements unrelated to climate change were read to them. The respondent was asked "I'd like to read you a few things that a person running for U.S. Senate in your State might say. After you listen to each one, I'll ask you whether you mostly agree with it, mostly disagree with it, or neither agree nor disagree with it. First, what if the candidate said the following: When we are dealing with foreign-born suspects with known ties to terrorist organizations, and these people are carrying out plans to indiscriminately kill Americans, we need to NOT treat them like they're common criminals. Treating these people like common criminals is dangerous, and it limits the intelligence information that we can gather from suspects. The suspected Christmas Day bomber could have provided valuable information about potential terror plots. Instead, he was charged in the civilian court system where he got a lawyer and stopped talking. When someone is given Miranda rights and access to a lawyer, gathering valuable information about possible terrorist plots is greatly diminished." The respondents was asked "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? "

The respondent was asked "Next, what if the candidate said this: Lifting the Cuba travel ban represents a blatant disregard of the human rights violations that the Castro regime commits against the Cuban people. This attempt to appease the Cuban dictatorship is wholly inconsistent with the United States' role as a beacon of freedom in this hemisphere, and around the world. This effort puts narrow corporate interests ahead of the need to protect the Cuban people from the Castro regime's brutal oppression. Canadian and European tourists have long made their way to Cuba, despite the fact that the Cuban regime has grown more repressive and living conditions for a majority of Cubans have declined to unprecedented low levels. The money they spend there

is handed over to the Castro regime's desperate totalitarian machine. Americans cannot allow themselves to be caught in the same trap of funding brutality." The respondent was asked "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? "

The follow questions were asked of all respondents in the state of Massachusetts when the issue statements unrelated to climate change were read to them. The respondent was asked: "I'd like to read you a few things that a person running for U.S. Senate in your State might say. After you listen to each one, I'll ask you whether you mostly agree with it, mostly disagree with it, or neither agree nor disagree with it. First, what if the candidate said the following: I believe that all Americans deserve quality, affordable health care, and that we must address the issues of rising health care costs and accessibility. Unfortunately, the recently enacted Federal health care legislation does not accomplish these goals and instead raises taxes on individuals and businesses, increases government spending, and will result in higher costs for consumers. I believe we must focus on fixing and replacing this law with common-sense health care reforms that drive down costs, make it easier for people to purchase affordable insurance, and strengthen the existing private market system." The respondent was asked "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? "

The respondent was then asked "Next, what if the candidate said this: I believe that terrorism is not a political issue; it is a national security issue. To win the war against terrorism, we must be able to quickly adapt to ever-changing terrorist tactics. Congress and the Administration must work together in a bipartisan fashion to continue support for all elements of national security, to increase information sharing and collective security efforts around the globe, and to expand vital law enforcement partnerships. Our Constitution and laws exist to protect this

nation — they do not grant rights and privileges to enemies in wartime. In dealing with terrorists, our tax dollars should pay for weapons to stop them, not lawyers to defend them." The respondent was asked "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? "

The follow questions were asked of all respondents in the state of Maine when the issue statements unrelated to climate change were read to them. The respondent was asked: "I'd like to read you a few things that a person running for U.S. Senate in your State might say. After you listen to each one, I'll ask you whether you mostly agree with it, mostly disagree with it, or neither agree nor disagree with it. First, what if the candidate said the following: Our nation remains a target for terrorists. Terrorists are unrelenting in their desire to kill Americans. We cannot let down our guard, and we must continue to meet this ongoing threat with strength and resilience. During the past eight years, significant resources have been devoted to the prevention of a terrorist attack using a biological, chemical, or nuclear weapon. But the improvised explosive device remains the weapon of choice for terrorists. And terrorists can also choose to use firearms. For many Americans, including many Maine families, the right to own guns is part of their heritage and way of life. This right is protected by the Second Amendment. And so our government confronts a difficult issue today: how do we protect the constitutional right of Americans to bear arms, while preventing terrorists from using guns to carry out their murderous plans? None of us wants a terrorist to be able to purchase a gun. But neither should we want to infringe upon a constitutional right of law-abiding Americans. " The respondent was asked "Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? "

The respondent was then asked "Next, what if the candidate said this: It makes no sense

that the capital and risk standards for our nation's largest financial institutions are more lenient than those that apply to smaller depository banks, when the failure of larger institutions is much more likely to have a broad economic impact. Yet that is currently the case. We must give the regulators the tools and the direction to address this problem. I have proposed an amendment that will strengthen the economic foundation of these firms, increase oversight and accountability, and help prevent the excesses that contributed to the deep recession that has cost millions of Americans their jobs. Increasing capital requirements as firms grow provides a disincentive to their becoming “too big to fail” and ensures an adequate capital cushion in difficult economic times. “The respondent was asked “Overall, do you mostly agree with what I just read, mostly disagree with it, or neither agree nor disagree with it? “

Appendix C: Measures of Global Warming Beliefs

The follow questions were asked of all respondents:

Measure	Survey Question	Coding of the Measure
The Earth's temperature has been rising.	You may have heard about the idea that the world's temperature may have been going up slowly over the past 100 years. What is your personal opinion on this - do you think this has probably been happening, or do you think it probably has not been happening? Probably has been happening Probably has not been happening	1 if "Probably has been happening"; 0 if "Probably has not been happening", or Don't Know or Refused
The temperature increase is due to things people do.	[Added "Assuming it's happening" among those who were coded 0 in "The Earth's temperature has been rising,] do you think a rise in the world's temperature (is being/would be) caused mostly by things people do, mostly by natural causes, or about equally by things people do and by natural causes? Things people do Natural causes Both equally	1 if "Things people do" or "Both equally"; 0 if "Natural causes", or Don't Know or Refused
Climate change issue public	How important is the issue of global warming to you personally – extremely important, very important, somewhat important, not too important, or not at all important? Extremely important Very important Somewhat important Not too important Not at all important	1 if "Extremely important" or "Very important"; 0 if "Somewhat important", or "Not too important", or "Not at all important", or Don't Know or Refused