

The Impact of the Fall 1997 Debate About Global Warming On American Public Opinion

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Summary of Findings

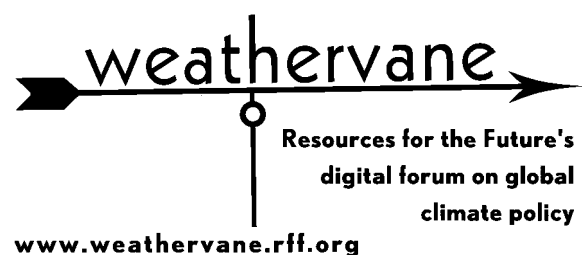
JULY 28, 1998 -- On October 6, 1997, the White House Conference on Global Climate Change kicked off a remarkable public debate in this country on the issue of global warming. During October and November of 1997, hundreds of stories on the topic appeared in the American news media. Television, radio, newspapers, and news magazines did a great deal to educate the American public about this complex environmental issue. The debate was further expanded by advertisements, paid for by business and other advocacy groups expressing their views on the issue.

Funded by the National Science Foundation, the U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the Ohio State University, and sponsored by Resources for the Future, we conducted a study of the impact of this public debate on public opinion. Specifically, the Ohio State University Survey Research Unit (SRU) conducted telephone interviews with a representative cross-section of 688 American adults, ages 18 and older, between September 1 and October 5, 1997, before the White House Conference and the subsequent spate of publicity. The SRU also interviewed another representative national cross-section of 725 adults between December 20, 1997, and February 13, 1998, following the signing of the Kyoto agreement. During both sets of interviews, each one lasting an average of 40 minutes, we asked an extensive range of questions relevant to global warming. (In the statistical analyses described in this report, the data were weighted to match the demographic composition of the American adult population.) This design allowed us to explore changes in public beliefs and attitudes from a variety of perspectives.

In this report, we address eleven general research questions:

- (1) Did the media blitz reach people, provoking them to think and learn more about the issue?
- (2) Did people develop more crystallized and behaviorally consequential views on the issue that were held with increased confidence?

*An executive summary of the Krosnick/Visser study
can be downloaded on the internet at --
http://www.rff.org/misc_docs/osu_short.pdf.*



- (3) Did people come to believe that scientists are more in agreement about global warming?
- (4) Did people come to believe more in the existence of global warming?
- (5) Did people come to believe that global warming will be worse for humanity than they previously believed?
- (6) Did people come to believe that global warming will be a more serious problem for the United States?
- (7) Were people more supportive of steps that could be taken by governments, businesses, and ordinary people to combat global warming?
- (8) Did the issue become more politicized, with Democrats and liberals splitting more sharply from Republicans and conservatives?
- (9) If attitudes and/or beliefs changed, whose changed the most?
- (10) What beliefs and attitudes were held by the segment of the American public most likely to express its preferences to government?

SUMMARY OF SOME PRINCIPAL FINDINGS

- The fall debate did focus more public attention on global warming, and people's opinions on the issue became more crystallized.
- Large majorities of the country believed in the existence of global warming and believed that it would have undesirable consequences, and the sizes of these majorities did not change during the fall.
- People wanted governments, businesses, and ordinary people to do quite a bit to combat global warming but believed very little was being done.
- Large majorities supported national and international restrictions on air pollution, and these majorities grew during the fall.
- Although a large majority of people said they were willing to pay more for utilities to reduce air pollution, this group shrank slightly during the fall.
- The fall debate polarized Democrats and Republicans along party lines.

- The fall debate had the most impact on people who were the least knowledgeable about global warming.

DETAILED RESULTS

Media Exposure, Thinking, and Knowledge

Slightly more exposure to news stories. The tremendous newspaper focus on global warming caught the attention of a remarkably limited subset of Americans. When asked during their December-February interviews whether they had read one or more stories about global warming in a newspaper since October 1, only 32 percent of the country said they had. This figure was barely greater than the 28 percent of people who said they had read one or more stories on global warming between May and August, when many fewer stories were being printed.

Television stories reached a larger proportion of the public. One-half of Americans reported having seen something on television about global warming between October and December-February. This figure is certainly greater than the proportion of people who reported having seen television coverage of global warming between May and August: 38 percent.

The joint effects of newspaper and television stories about global warming spread significantly further than either medium alone. In September-October, 48 percent of respondents said they had seen either a newspaper or television story, and this figure rose to 56 percent in December-February.

We did not ask respondents how many stories they saw during each period, because we felt this was such a difficult recall task that many respondents would be unable to provide accurate reports. So it is possible that attentive people were exposed to a larger volume of information about global warming between October and December than they had been during the previous months. But our findings clearly suggest that penetration of such stories across the population did not go much more broadly than had been the case before the White House Conference.

Significantly more thinking about global warming. The increased media attention to global warming did apparently provoke people to think more about the issue than they had previously. When asked in September-October how much thinking they had done about global warming, 54 percent of respondents said either “a lot” or a “moderate amount”. When asked this question in December-February, 65 percent gave one of these two answers, representing a statistically significant increase. This is evidence of quite sizable growth in the fraction of the public that was cognitively engaged in the issue.

No knowledge gained. Although people were exposed to more news stories, people did not feel any more knowledgeable about global warming after the media blitz than they had before. During the September-October interviews, 42 percent of respondents said they had “a lot” or “a moderate amount” of knowledge about the issue, and 44 percent said so during the December-February interviews, a non-significant change.

Crystallization and Consequentiality of Opinions

Faster reaction time. Psychologists gauge how crystallized a person's opinion on an issue is partly by the how long it takes him or her to report that opinion when asked. The longer it takes to retrieve the opinion from memory and/or to build the opinion from miscellaneous considerations that come to mind, the less crystallized that opinion is. If media coverage of global warming did indeed lead people to think more about the issue, this should have crystallized their opinions, leading them to be reported more quickly.

Consistent with this logic, people were significantly quicker at reporting their overall attitudes toward global warming during the December-February interviews than they had been during the September-October interviews. During the former interviews, attitudes were reported in 2.9 seconds on average, as compared to 3.3 second on average during the latter interviews.

Higher certainty. A second indicator of the strength of people's opinions on an issue is the confidence with which they hold those opinions. In September-October, 28 percent of respondents said they were extremely or very sure of their opinions on global warming, and this figure rose significantly to 33 percent in December-February, a statistically significant increase.

Higher personal importance. Another indicator of the strength of people's opinions is the amount of personal importance they attach to a political issue. When an issue becomes extremely important to a person, it is very difficult to change his or her opinion on it, and he or she tends to rely heavily on that issue when voting in elections. In September-October, 8 percent of Americans said the issue of global warming was extremely important to them personally, a figure comparable to that for most domestic policy issues. In December-February, this figure rose slightly but statistically significantly, to 11 percent.

This change means that approximately 7.5 million Americans joined the global warming "issue public", the segment of the electorate most passionately concerned about this issue. Past research has shown that on a wide range of policy issues, issue public members are especially active in expressing their views, writing letters and making telephone calls to their representatives in government, and writing letters for publication in newspapers and magazines. Issue public members are also the heaviest financial contributors to lobbying groups, and they decide how to vote in elections primarily on the basis of the issue. So having the ranks of the most activist segment of Americans on global warming rising by nearly 40 percent is more significant than it might at first appear, because the most vocal and influential segment of the public on this issue nearly doubled in size.

Perceived Scientific Consensus

One of the key points of contention in the Fall debate was the opinions of scientists on the issue. President Clinton, Vice President Gore, and others asserted that scientists are largely in agreement that global warming is real and will be bad for people, while other parties asserted that there is deep division within the scientific community on this issue. When asked in September-October, 60 percent of people said they thought there was a lot of disagreement among scientists about whether or not global warming is happening, while 38 percent of people said they thought most scientists agreed with one another. Perceived disagreement rose significantly during the Fall, with 67 percent of people saying there was a lot of disagreement about this among scientists in December-February.

The Existence of Global Warming

When asked in September-October, a large majority of people (77 percent) said they thought the world's temperature probably had been rising during the last 100 years, and this figure was essentially unchanged in December-February (79 percent). Similarly, 74 percent of people asked in September-October said they thought the world's temperature will probably go up in the future if nothing is done to stop it, and this figure was 75 percent in December-February, not significantly different. Thus, the vast majority of Americans walked into the Fall debate believing that the world's temperature had been rising and would continue to do so, and the much smaller segment of skeptics were not convinced otherwise.

The Consequences of Global Warming

In September-October, a majority of respondents (61 percent) believed that global warming would be bad. 15 percent of people thought it would be good, and 21 percent thought it would be neither good nor bad. In December-February, this latter percentage rose significantly, to 26 percent, and the other two percentages dropped slightly. Thus, a necessary condition for people to be concerned about global warming (i.e., believing that it would be harmful to people) was met by fewer people after the Fall debate than before.

We also asked people about 6 specific effects that global warming might have: on the sea level, water shortages, food supplies, numbers of animal and plant species, and storms (i.e., hurricanes and tornadoes). Most respondents in September-October believed global warming would cause undesirable outcomes: more storms (69 percent), reduced food supplies (57 percent), more water shortages (54 percent), rising sea levels (52 percent), and extinction of some animal (52 percent) and plant species (50 percent). None of these percentages were significantly different in December-February, suggesting that the Fall debate did not affect these opinions. Likewise, on average, people believed that global warming would cause 3.4 of the 6 negative consequences we asked about in September-October, and this average was 3.3, not significantly different, in December-February.

In order to explore the impact of these beliefs on attitudes toward global warming, we conducted Ordinary Least Squares regressions. There were six predictors in this equation, one for each of the six possible effects outlined above (e.g., on sea level and number of plant species). Each predictor variable was the product of three variables: whether or not the respondent thought global warming would affect this phenomenon, how good or bad this effect would be, and how certain he or she was this would occur.

The resulting regression coefficients shown in Table 1. A positive and statistically significant coefficient would mean that people decided how good or bad global warming would be based on how good or bad its effect on this aspect of the world would be. The larger a coefficient is, the more respondents based their attitudes toward global warming on this particular effect. As the first column shows, three of the six effects we asked about had statistically significant impact on attitudes in September-October: sea level changes, food supplies, and animal species extinction.

People placed the most weight on sea level changes, perhaps because effects of global warming in this regard have frequently been discussed in the news media with confidence. The two most impactful considerations involved shelter (because rising sea levels would wipe out homes) and food, both basic human subsistence needs. But significant weight was also placed on a more symbolic concern with less self-interest involved: animal species extinction. These same three considerations had significant weight in December-February, with the effect of sea level being significantly larger than it had been in September-October.

National Seriousness Judgments

Perhaps the most important goal of the Clinton Administration was to convince Americans that global warming deserves to be placed higher on our list of national priorities. In light of the findings reported thus far, it should come as no surprise that this goal was apparently not achieved. In September-October, 33 percent of people said global climate change is likely to be an extremely or very serious problem for the country, 51 percent said it is likely to be pretty or slightly serious, and 16 percent said it is likely to be no problem at all. These figures were essentially unchanged in December-February.

Support for Steps to Combat Global Warming

Different possible strategies for combating global warming have been proposed and discussed by experts. We found that public support for significant intervention efforts was quite strong, support for some specific tactics rose, and support for other tactics declined.

When asked how much should be done to combat global warming in September-October, majorities of people supported significant effort. For example, 59 percent said the U.S. government should do “a great deal” or “quite a bit”, 58 percent said the same about other countries’ governments, and 59 percent said so about U.S. businesses. However, only 44 percent said average people should do “a great deal” or “quite a bit.” Remarkably, only very small proportions of people believed these various groups were in fact doing “a great deal” or “quite a bit”: 10 percent regarding the U.S. government, 4 percent regarding foreign governments, 7 percent regarding U.S. businesses, and 5 percent regarding average people. None of these figures changed appreciably in December-February.

We asked about one general strategy for combating global warming: reducing air pollution. Large majorities of Americans believed that reducing air pollution will reduce future global warming: endorsed by 80 percent of respondents in September-October and 79 percent in December-February.

Support for some means of accomplishing this grew over the fall. For example, in September-October, 88 percent of people said the U.S. government should limit the amount of air pollution U.S. businesses can produce, and this figure rose slightly but significantly to 91 percent in December-February. Also, the proportion of people who thought the U.S. should require that countries to which it gives money should reduce their air pollution production rose significantly, from 71 percent in September-October to 80 percent in December-February.

On the other hand, people became *less* willing to make personal financial sacrifices to combat global warming. When asked whether they would be willing to pay more money for their monthly utility bills to reduce the amount of air pollution utility companies produce, 77 percent of people said they would in September-October, but only 72 percent said so in December-February.

Growing Partisan Division

With President Clinton and Vice President Gore championing the global warming cause and many prominent Republicans and conservatives expressing skepticism, one might imagine that Americans would also split along partisan and ideological lines in their beliefs on the subject. And indeed, in September-October, this was generally true. Democrats and liberals were slightly more likely than Republicans and conservatives to believe that global warming is real, that it would be bad, and that it will be a serious

national problem. Furthermore, although some of these splits were no more pronounced in December-February than they were in September-October, others did grow in magnitude, suggesting that the issue became more politicized.

Attitudes toward global warming did not become more polarized along party or ideological lines. For example, in September-October, 54 percent of people who considered themselves to be strong Democrats thought global warming would be bad, while 51 percent of strong Republicans shared this attitude, a gap of 3 percent. In December-February, 59 percent of strong Democrats held this attitude, as compared to 53 percent of strong Republicans, a gap of 6 percent.

Beliefs about whether global warming has been happening during the last 100 years did become increasingly polarized along partisan lines. For example, in September-October, 72 percent of strong Democrats believed the earth's temperature had been rising, as compared to 68 percent of strong Republicans, a 4 percent gap. In December-February, these figures were 88 percent and 69 percent, respectively, revealing 19 percent gap.

The same pattern was apparent in beliefs about whether global warming will happen in the future. In September-October, 75 percent of strong Democrats thought so, compared to 67 percent of strong Republicans, an 8 percent gap. By December-February, the fraction of Democrats had grown slightly to 77 percent, while the share of Republicans had declined to 55 percent, revealing a 22 percent gap.

This polarization was also apparent in the number of undesirable consequences people thought global warming would cause (e.g., reduced food supplies, more water shortages, etc.). In September-October, only 15 percent of strong Democrats thought that global warming would cause none of the six undesirable consequences we asked about, and 11 percent of strong Republicans shared this view. In December-February, fewer strong Democrats (only 4 percent) thought global warming would have none of the six undesirable effects, and many more Republicans (27 percent) held this view, a 23 percent partisan gap.

These results make it clear that more attitude change occurred during the Fall than the distributions of answer from all respondents reveal. On some issues, Democrats moved toward President Clinton's views, and Republicans moved away from his views, canceling out at least partly when combined together.

Who Was Influenced Most?

The gap between Democrats and Republicans increased most among the people who knew the least about global warming. Consider first, for example, beliefs about whether global warming has been happening. Among people who knew little about global warming, the partisan gap on this issue rose from 1 percent in September-October to 20 percent in December-February. In contrast, among people who were more knowledgeable about global warming, the partisan gap rose only slightly, from 9 percent in September-October to 11 percent in December-February.

The same pattern was evident in beliefs about whether the U.S. government should limit air pollution by U.S. businesses. Among people who knew little about global warming, the partisan gap increased from 2 percent in September-October to 14 percent in December-February. In contrast, among people who knew a lot about global warming, the partisan gap increased only slightly, from 7 percent in September-October to 8 percent in December-February.

Beliefs and Attitudes of the Issue Public

If global warming is like most other policy issues, the voices of issue public members -- people who attach great personal importance to the issue -- will be heard most often, either directly from them, or indirectly through the lobbying groups they support. It is therefore useful to know where these individuals stood on the issue in September-October and whether this changed by December-February.

Past research on other issues has shown that majority views among issue public members are often not the views of the majority of the entire American public (e.g., Schuman & Presser, 1981). For example, whereas the majority of the American public favored legalized abortion during the late 1970s, there was more passion on the anti-abortion side, so the majority of the issue public opposed legalized abortion. And at the same time, the majority of the American public favored strict gun control laws, but the majority of the issue public opposed such laws.

More prevalent negative attitudes. In fact, there are sharp attitude and belief differences between people who said the issue of global warming was highly personally important to them personally and those who did not. For example, 76 percent of the issue public believed in September-October that global warming would be bad, whereas only 54 percent of people not especially concerned about the issue held that belief. These percentages were 74 percent and 50 percent, respectively, in December-February, illustrating the same gap.

More belief in global warming's existence. In September-October, 91 percent of the issue public believed that global warming had been occurring during the last 100 years, whereas only 70 percent of people who attached little personal importance to the issue. These figures were essentially unchanged in December-February. In September-October, 84 percent of the issue public thought global warming would occur in the future, as compared to 66 percent of the least personally involved respondents. Both of these figures increased in December-February, to 89 percent and 69 percent, respectively, but the gap between personally involved and uninvolved people remained apparent and about equal in size.

Policy preferences. In light of the above results, it should not be surprising that issue public members more often supported specific policies intended to combat global warming. For example, in September-October, 91 percent of the issue public said the U.S. government should limit air pollution by U.S. businesses, as compared to 85 percent of people personally uninvolved in the issue. Likewise, 83 percent of the issue public said the U.S. should require countries to which it gives foreign aid to reduce air pollution, as compared to only 65 percent of people less personally involved in the issue. Although all of these figures rose in December-February, the gaps between issue public members and non-members remained essentially the same.

CONCLUSION

The fall debate on global warming served the constructive function of focussing public attention on the issue. Modest changes in the distributions of opinions occurred for the nation as a whole, and underlying these modest changes were more sizable changes due to the polarization of Democrats and Republicans, especially among the least knowledgeable segment of the electorate.

METHODOLOGICAL CONSIDERATIONS

Comparability of the September-October and December-February Samples

Table 2 displays the unweighted demographic characteristics of the samples of people interviewed in September-October and December-February for our surveys. The remarkable resemblance of the first two columns to one another means that the groups of people interviewed in September-October very closely resembled those interviewed those interviewed in December-February. Indeed, none of the differences between columns 1 and 2 are statistically significant. This challenges any notion that the differences we have observed between the attitudes and beliefs of these two samples are due to differences in sample composition on the two occasions. Attributes of respondents that should be comparable are indeed so. Therefore, observed attitude and belief changes seem likely to be attributable to impact of the intervening events.

Representativeness of the Samples

The third column of Table 2 presents a portrait of the American adult population's demographic characteristics according to the U.S. Census Bureau. As is true of even the best national surveys (see, e.g., Brehm, 1992), our samples under-represent some demographic groups and over-represent others. Specifically, whites, more educated people, and women are over-represented, and people from the Pacific region of the country are under-represented. These differences are inherent attributes of survey samples and fortunately are not so large as to raise concern about significant sample unrepresentativeness.

REFERENCES

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TABLE 1:
Effects of Specific Beliefs About
Global Warming on Attitudes

<i>Effect</i>	<i>September- October</i>	<i>December- February</i>
Sea Level	.19***	.28***
Food Supplies	.12**	.10**
Animal Species	.10*	.07+
Water Shortages	-.05	-.05
Plant Biodiversity	.04	.05
Hurricanes & Tornadoes	.00	-.01
R ²	.15	.19
N	602	594

Note: Table entries are unstandardized coefficient estimates from ordinary least squares regressions predicting attitudes toward global warming.

**TABLE 2:
Sample Demographics**

<i>Variable</i>	<i>Wave One</i>	<i>Wave Two</i>	<i>U. S. Population¹</i>
RACE			
White	83.8 percent	82.4 percent	75.2 percent
African-American	7.3	9.4	11.1
Other	8.9	8.1	13.7
EDUCATION			
Less than H.S.	6.3 percent	6.5 percent	19.1 percent
H.S. Graduate	26.5	25.1	34.4
Some College	33.4	33.5	24.4
College Graduate	33.9	34.8	22.2
AGE			
18-29	18.5 percent	23.0 percent	22.0 percent
30-44	38.5	33.6	32.7
45-59	23.3	25.1	22.9
60+	19.8	18.4	22.4
GENDER			
Female	57.8 percent	53.4 percent	52.0 percent
Male	42.2	46.6	48.0
REGION			
New England	4.9 percent	6.1 percent	5.0 percent
Mid-Atlantic	12.4	14.8	14.6
East North Central	19.0	17.2	16.7
West North Central	9.3	9.9	7.0
South Atlantic	20.3	19.3	18.0
East South Central	4.9	6.1	6.1
West South Central	12.2	10.5	11.0
Mountain	5.1	5.9	5.9
Pacific	11.8	10.2	15.7
N	688	725	

¹ *These figures are projects by the U. S. Census Bureau of the demographic composition of the American population based upon their own data collections. The figures for race, age, gender, and region are based upon projections for 1997. The figures for education are based upon a projection for 1994. And the figures for region are based upon a projection for 1995.*

**SUMMARY TABLE:
Changes in Beliefs And Attitudes
about Global Warming**

<i>Variable</i>	<i>September- October</i>	<i>December- February</i>
NEWS FLOW		
Saw newspaper/television story about GW During the last few months	48 percent	56 percent*
Had a lot or a moderate amount of knowledge About GW	42	44
CRYSTALLIZATION OF OPINIONS		
Thought a lot or a moderate amount about GW	54 percent	65 percent*
Speed in reporting attitudes toward GW	3.3 sec.	2.9 sec.*
Extremely or very sure about opinions on GW	28 percent	33 percent*
Issue of GW extremely personally important	8	11*
PERCEPTIONS OF SCIENTISTS		
Perceive a lot of disagreement among scientists	60 percent	67 percent*
GLOBAL WARMING'S EXISTENCE		
GW has been happening during the last 100 yrs.	77 percent	79 percent
GW will happen in the future if nothing is done	74	75

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Summary Table (continued)

<i>Variable</i>	<i>September- October</i>	<i>December- February</i>
GLOBAL WARMING'S CONSEQUENCES		
GW will be bad	61 percent	58 percent*
GW will cause more storms	69	68
GW will reduce food supplies	57	57
GW will cause more water shortages	54	55
GW will cause sea level to rise	52	52
GW will cause extinction of animal species	52	51
GW will cause extinction of plant species	50	51
NATIONAL SERIOUSNESS		
GW will be an extremely or very serious problem for the U.S.	33 percent	33 percent
EFFORT TO COMBAT GLOBAL WARMING		
U.S. government should do a great deal or quite a bit to combat GW	59 percent	57 percent
Foreign governments should do a great deal or quite a bit to combat GW	58	58
U.S. businesses should do a great deal or quite a bit to combat GW	59	59
Average people should do a great deal or quite a bit to combat GW	44	43

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Summary Table (continued)

<i>Variable</i>	<i>September- October</i>	<i>December- February</i>
COMBATING STRATEGIES		
Reducing air pollution will reduce GW	80 percent	79 percent
U.S. government should limit air pollution by U.S. businesses	88	91*
U.S. should require air pollution reduction from countries receiving foreign aid	71	80*
Willing to pay more for utilities to reduce air pollution	77	72 *
PARTISAN DIVISION		
GW has been happening during the last 100 yrs.		
Strong Democrats	72 percent	88 percent*
Strong Republicans	68	69
Difference	4	19
GW will happen in the future		
Strong Democrats	75 percent	77 percent
Strong Republicans	67	55*
Difference	8	22
GW will have no undesirable consequences		
Strong Democrats	15 percent	4 percent*
Strong Republicans	11	27*
Difference	4	-23

ABOUT THE AUTHORS

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Dr. Krosnick has provided expert testimony in state and federal courts on voting and elections and on survey research methods; has lectured on political psychology and survey methods at universities in the U.S., the U.S. General Accounting Office, the U.S. Bureau of the Census, and the Internal Revenue Service; and has served as a consultant to commercial firms, foundations, and government agencies, including the National Oceanic and Atmospheric Administration, the National Institutes of Health, the National Science Foundation, the Urban Institute, and Monitor Company. He currently serves on the Board of Overseers of the National Election Studies, the nation's leading academic survey studies of politics. He was recently awarded the Erik H. Erickson Early Career Award for Excellence and Creativity in the Field of Political Psychology.

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Penny's primary lines of research focus on various aspects of attitudes and persuasion, particularly within the political context. Her work explores the social and psychological processes by which people resist attitude change, as well as the impact of attitudes on information processing and on behavior. Her work also addresses a number of methodological issues in survey research, including methodological factors associated with pre-election polling accuracy.

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ABOUT RFF

Resources for the Future (RFF) is a nonprofit and nonpartisan organization headquartered in the nation's capital that conducts independent research -- rooted primarily in economics and other social sciences -- on environmental and natural resource issues. While many RFF staff members are economists by training, other researchers hold advanced degrees in ecology, city and regional planning, engineering, American government, and public policy and management. RFF neither lobbies nor takes positions on specific legislative or regulatory proposals. Its operating budget is derived in approximately equal amounts from three sources: investment income from a reserve fund; government grants; and contributions from individuals, foundations, and corporations (corporate support cannot be earmarked for specific research projects). Some 45 percent of RFF's total funding is unrestricted. For more information about RFF, on the internet go to -- <http://www.rff.org>.

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