FEAR APPEALS, COLLECTIVE ACTION, AND PUBLIC OPINION: TESTING THE RISK PERCEPTION ATTITUDE [RPA] FRAMEWORK IN THE CONTEXT OF GLOBAL WARMING

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ABSTRACT

Threat, fear, and risk are pervasive elements of political communication. This study examines public opinion towards policy addressing global warming as well as intention to perform behavioral actions to address global warming. This study utilizes risk and efficacy perceptions, the two main concepts of the Extended Parallel Process Model [EPPM] and the Risk Perception Attitude Framework [RPA] as the main theoretical concepts useful for understanding the public's response to political issues addressed in fearful terms. Analysis of the data (a national sample of 754 participants) provides evidence that the relationships predicted by these theories are applicable to political communication about legislative policy and recommendations for behavioral intentions. Implications for advocacy and future research are discussed.

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CHAPTER 1

INTRODUCTION

1.1 The Use of Fear to Motivate People to Political Action

Proponents of policies and advocators for activism face tremendous obstacles as they attempt to mobilize citizens for their causes. They must overcome the slew of ordinary concerns that characterize everyday life in addition to competing with advocates for attention to other societal problems. In an attempt to overcome these barriers, advocates often turn to fear appeals – attempts to motivate the public by warning them of the consequences of inaction. This study examined the public's response to the communication climate of fear surrounding the issue of global warming to see if factors such as risk perception and efficacy perception are related to individual's attitudes and intentions about global warming.

One of the obstacles that communicators face when they attempt to draw individuals to their cause is the "free-rider" problem. Olson (1971) identifies this problem as the likelihood that rational individuals believe that even if they personally do not work towards fulfillment of a collective good, their abstention will not make a difference. A rational person, therefore, is predicted to prefer taking a "free-ride," that is, getting the benefit from the common good that was provided by other peoples' efforts. Olson theorizes that the larger the collective, the more likely this "free rider" phenomenon will

occur. Downs (1957) also addresses the problem of collective action – approaching individual participation from an economic perspective and concluding that a rational individual would not feel compelled to vote because of the extremely low probability that the individual would cast a deciding vote. Specific to the issue of the environment, Hardin (1968) noted that when it comes to pollution, "we are locked into a system of 'fouling our own nest,' so long as we behave only as independent, rational, free-enterprisers" (p. 1245) because the individual actions cost more than the benefit that individual will immediately and directly receive. Additionally, Karau and Williams' (1995) discussion of social loafing ("free ride") notes that an additional determinant of action is the degree to which the individual feels that his or her actions are instrumental for the group to succeed. It seems that if global warming is to be addressed, advocates must turn to ways to motivate individuals to perform actions, which are small when considered uniquely, but when joined with thousands of other actions could be quite powerful.

In an attempt to overcome these barriers to participation, many advocates turn to fear appeals as a way to motivate people to adopt their cause (Roser & Thompson, 1995). Advocates, however, are not the only people who discuss problems with fear-inducing language. Altheide (2002) stipulates "that fear has become a dominant public perspective" (p. 3) that permeates not only persuasive appeals, but also political discourse, entertainment, and news media. In fact, news media often discuss problems in fearful terms. Several writers have noted that journalists see conflict and drama as core elements of a good news story (Fallows, 1996; Garrison, 1990; Smith, 1997), therefore they tailor an issue to fit these molds – often highlighting possible dangers of a situation

(Richards, 2001). It seems that public communication often holds elements of fear appeals – warnings, dramatic portrayal of human consequences, and tips for how to avoid them.

1.2 Fear Appeals in the Context of Global Warming

This tendency towards fear is evident in the discourse climate regarding the issue of global warming – a communication atmosphere churning with fear appeals. Ereaut and Segnit (2006) note,

> Climate change [global warming] is most commonly constructed through the alarmist repertoire – as awesome, terrible, immense and beyond human control. This repertoire is seen everywhere and is used or drawn on from across the ideological spectrum, in broadsheets and tabloids, in popular magazines and in campaign literature from government initiatives and environmental groups. It is typified by an inflated or extreme lexicon, incorporating an urgent tone and cinematic codes. It employs a quasi-religious register of death and doom. (p. 7)

Headlines such as "The Climate of Fear" (Leake & Milne, 2006), "Has the Day After Tomorrow Arrived? (Catt, 2006), "The Big Meltdown" (Purdy, April 23, 2006), and "Scared of Global Warming and Eager to Spread the Fright" (Lee, April 22, 2006) all emphasize the frightening aspects of global warming. Additionally, magazine covers match dramatic headlines such as "Be Worried, Be **Very** Worried" with theatrical images that emphasize the scary facets of the issue (e.g. Figures 3 and 4). In Moser and Dilling's (2004) article entitled "Making Climate Hot: Communicating the Urgency and Challenge of Global Climate Change" they note that as scientists and environmental activists have drawn increasingly certain that human behavior is contributing to global warming, they

have realized the need to mount public communication efforts designed to convince people to take action to prevent the effects of global warming and to support public policy addressing the issue (see also National Center for Atmospheric Research, 2004). Environmental advocates have turned to television and cinema to portray the dangers of global warming. The website for Al Gore's movie "An Inconvenient Truth" proclaims,

> Humanity is sitting on a ticking time bomb. If the vast majority of the world's scientists are right, we have just ten years to avert a major catastrophe that could send our entire planet into a tail-spin of epic destruction involving extreme weather, floods, droughts, epidemics and killer heat waves beyond anything we have ever experienced.

A prominent environment organization, The Environmental Defense Fund (2006), has created two 30 second television ads which dramatically portray the dangers for future generations (e.g. Figure 5). Clearly, the discourse surrounding global warming is permeated with fear appeals. Therefore, in order to understand the public's attitude and intentions regarding preventing global warming, it seems useful to examine previous research on persuasion using fear appeals.

1.3 Social Scientific Understanding of the Response to Fear Appeals

Researchers have come a long way in the understanding of how fear appeals, risk perceptions, and efficacy perceptions relate to the acceptance of message recommendations. The most robust literature on fear appeals can be found in the health communication and behavioral context. Researchers have investigated such topics as AIDS prevention (Witte, 1992b), tractor safety (Witte, 1995), gun safety (Roberto, Meyer, Johnson, & Atkin, 2000), rape prevention (Morrison, 2005), skin cancer

prevention (Stephenson & Witte, 1998), and electromagnetic fields (McMahan, Witte, & Meyer, 1998). This line of research has revealed much about how people process and respond to fear appeals; additionally, this literature has greatly contributed to the theoretical understanding of concepts relevant to the study of persuasion using fear appeals. Although the primary investigation of fear appeals has been in the study of health behavior messages, the theoretical frameworks developed by health communication scholars can also be useful for examining attitudes towards public policy messages. In fact, the earliest health communication works devoted to fear appeals specifically mention that political and social contexts are ripe arenas for studying the use of fear as a motivator (Hovland, Janis, & Kelley, 1953; Janis & Feshbach, 1953). An earlier model of fear appeals, the protection motivation model, has been used to examine political issues such as fear of crime (Cates, Dian, & Schnepf, 2003) and formation of active publics (Roser & Thompson, 1995). Additionally, in the field of political psychology, several scholars have examined a theoretically comparable field by looking at political behavior and opinions in relation to threat perceptions. Investigators have examined such topics as response to September 11th (Huddy, Feldman, Capelos, & Provist, 2002), political intolerance (Feldman & Stenner, 1997; Marcus, Sullian, Theiss-Morse, & Wood, 1995), and Israeli public opinion (Arian, 1995; Gordon & Arian, 2001; Jacobson & Bar-Tal, 1995). Clearly, political communication about issues of public policy contains ubiquitous uses of fear appeals in attempts to gain support for particular policy positions – from the infamous McCarthy trials (Griffith, 1970) to contemporary concerns about online policy (Metzger & Docter, 2003). It seems reasonable to believe that fear appeals in the political arena may work in much the same way as fear appeals in

the health arena; however, little research has attempted to integrate the theoretical perspectives of these contexts. Roser and Thompson (1995) note that, although advocates often use fear appeals, theorists often overlook the "variables of perceived risk and severity of potential harm" in considering why people join collective action; they assert that these variables "may be central to the creation of active publics" (pg. 108). More research in this area would broaden the understanding of the fear appeals process as well as informing political communication scholars as to the uses and effects of fear appeal messages.

Additionally, the study of fear appeals in the political context introduces new questions. Politics has been explained by Morgenthau (1958) as the negotiation of the authoritative allocation of resources in society. As this definition implies, political questions readily relate to societal level issues as well as to personal intersections of the individual with society. Studies of fear appeals in the political context are uniquely situated to explore both personal and societal dimensions of responses to fear appeals, allowing for an increased understanding of how fear appeals work in the realm of collective action.

This study will use the Risk Perception Attitude [RPA] framework developed by Rimal and Real (2003) to examine public attitudes about global warming, incorporating personal, collective, and legislative perceptions of this issue into the model. First, the RPA framework will be explained, followed by a theoretical discussion of the difference between personal, collective, and legislative perceptions, and concluding with hypotheses that integrate the RPA framework with the personal and societal levels of risk and efficacy perceptions.

1.4 Explication of the Risk Perception Attitude Framework

The RPA framework (Rimal and Real, 2003) provides a useful conceptualization of how people are predicted to respond to fearful issues. The RPA framework clarifies and extends the predictions of the Extended Parallel Process Model (EPPM; Witte, 1992a); therefore, it is helpful to understand the core components of the EPPM before discussing the RPA framework. As the RPA framework and the EPPM have been conceptualized and empirically examined with personal perceptions, the following discussion will focus on personal perceptions, with explanation of how collective and legislative perceptions can be conceptualized following in the next section.

The EPPM asserts that the use of fear in a persuasive message can cause a person to evaluate his or her perceptions of threat and efficacy towards the issue discussed in the fear appeal (Witte, 1992a). The EPPM is based on this fear appeal message, which contains a threat and a proposed recommendation to alleviate that threat. In EPPM an individual's threat perception is composed of two components, perceived susceptibility and perceived severity. Perceived susceptibility is the belief of an individual about the likelihood of experiencing a threat (Witte, 1992a). An individual would have high perceived susceptibility if he or she believed that it was highly likely that a given threat would occur. For example, an individual would have high perceived susceptibility if he or she believed that it was likely that global warming is happening and will personally affect him/herself; conversely, an individual would have low perceived susceptibility if he or she did not believe that global warming is occurring. Perceived severity is defined as the belief of an individual about how serious the threat would be if it occurred. While perceived susceptibility addresses the likeliness of the occurrence of the threat, perceived

severity addresses the gravity of the consequences if a threat should occur. An individual would have high perceived severity if he or she thinks that global warming is occurring and that it has serious and severe personal consequences. As previously mentioned, taken together, the concepts of perceived susceptibility and perceived severity constitute a person's threat perception.

The two components of perceived response efficacy and perceived personal efficacy constitute an individual's efficacy perception of the recommendation to alleviate the threat. Perceived response efficacy is the belief of an individual about whether the recommended response prevents or mitigates the threat (Witte, 1992a). An individual would have high perceived response efficacy if he or she believed that the proposed recommendations and policies about global warming would be effective at preventing the occurrence of global warming, or would mitigate the seriousness of the consequences. Perceived self-efficacy is the belief of an individual about his or her capacity to implement the proposed response. An individual would have high perceived self-efficacy if he or she believed that the proposed actions and policies could be easily adopted. Taken together, the concepts of perceived response efficacy and perceived self-efficacy constitute a person's efficacy perception. In the political realm, this overall efficacy perception is similar to Balch's (1974) conceptualization of "internal efficacy" as perceiving oneself as capable of influencing the government.

Based on individual's threat and efficacy perceptions, the EPPM suggests three responses to fear appeal messages: message acceptance, message rejection, and no response (Witte, 1992a). Message acceptance is predicted to occur when individuals have both high perceptions of threat and efficacy; that is, individuals are scared that the threat

could affect them aversely, but also feel like they can respond in such a way to reduce the threat. Therefore, individuals enter what the EPPM calls the danger control process, where they are motivated to control the threat and are likely to accept the message. Message rejection is predicted to occur when individuals have high perceptions of the threat, but low perceptions of efficacy; that is, individuals are scared that the threat could affect them adversely, but feel that they cannot prevent it from occurring. As a result, the EPPM predicts that individuals will engage in fear control. In this process, individuals act in ways to manage their fear by denying the threat, avoiding the threat, or engaging in reactance against the message. Finally, the EPPM predicts that some individuals will have no response to the message. No response is predicted to occur in individuals who have low risk perceptions. The EPPM explains that the message has probably failed to invoke fear in these individuals; therefore, they are not likely to even process the message because they do not feel like the threat will affect them.

Working from these predictions of the EPPM, Rimal and Real (2003) have developed the risk perception attitude framework (RPA). The RPA framework is conceptually similar to the EPPM, but differs by distinguishing threat from risk and by classifying individuals into four attitudinal groups.

Firstly, EPPM uses the term "threat" perceptions while RPA utilizes the term "risk" perceptions. Although the concepts of risk and threat are closely related, they are conceptually distinct. Succinctly stated, "threat" is a property of a message while "risk" is an attribute of an individual; a "threat" has the possibility of affecting the "risk" that a person perceives. Accordingly, the EPPM treats threat as a property of the message; typically, studies using the EPPM manipulate the message to produce high and low threat

conditions. As Rimal and Real (2003) note, the EPPM seems to assume that threats made translate into risks perceived. The RPA framework, consequently, uses the concept of risk and conceptualizes it as an attribute of the individual. Therefore, RPA refines the EPPM by situating the person, rather than the message, as the central part of the framework. This reconceptualization divorces attitudinal and behavioral outcomes from one specific message, thereby allowing a broader look at a person's perceptions of fear-inducing situations by examining individuals' risk and efficacy perceptions in naturally occurring conditions rather than strictly in experiments. Therefore, the RPA is particularly useful for this study as the present research does not manipulate a message, but instead measures naturally occurring conditions of risk and efficacy perceptions, assuming that the respondents have been exposed to the global warming debate through the media.

Secondly, RPA differs from EPPM by identifying four attitudinal groups. These attitudinal groups are based on the risk and efficacy perceptions of individuals. The first group, those with *responsive* attitudes, is comprised of those individuals who have high perceived risk and high perceived efficacy. In other words, the responsive group is made up of individuals who are convinced that there is a significant risk, and are also convinced that the proposed solution will mitigate the risk. This group is predicted to take the danger control path postulated by the EPPM, and therefore be the group that displays the greatest adoption of the recommendations. The second group is characterized by individuals with *proactive* attitudes. This group has low risk perceptions, but high efficacy perceptions. Therefore, the people in this group are not likely to think that there is a high risk, but feel that they can implement the proposed recommendations easily.

EPPM would predict that individuals in this group would not adopt recommendations, because they do not even think about proposed recommendations since they are not afraid. The RPA framework, however, predicts that the proactive group will implement recommendations with a "why not?" attitude. That is, although they perceive low risk, they feel that they can easily implement the recommendations and therefore will do so. The third group is comprised of individuals with *avoidant* attitudes. This group has high risk perceptions but low efficacy perceptions. Individuals in this group perceive that there is a high likelihood of significant problems; however, they remain unconvinced that anything can be done about it. Therefore, this group is predicted to take the fear control path postulated by the EPPM and is unlikely to adopt the recommendations. The fourth group is characterized by individuals with *indifference* attitudes. This group has low risk perceptions and low efficacy perceptions. People in this group do not think a problem exists, and do not think that the recommendations will help. This group is predicted to be the group with the least adoption of the recommendations.

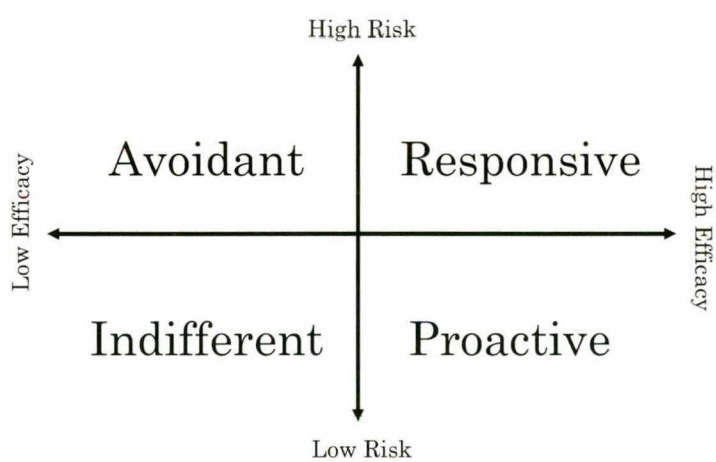

Figure 1. Risk Perception Attitudinal Groups

Therefore, the RPA framework utilizes the EPPM to predict that the responsive group will be the most likely to adopt recommended attitudes and behaviors, followed by the proactive, avoidant, and indifferent groups. In the context of the present study, it is expected that this hierarchy of groups will be seen in both policy preferences (favor specific legislation) and behavioral intentions to perform some collective action (i.e. vote, replace old appliances, etc.).

1.5 Perceptions of Collective Risk and Efficacy

As previously mentioned, the RPA and EPPM have conceptualized risk and efficacy as strictly personal perceptions. However, the concepts of risk and efficacy have elsewhere been discussed as having both personal and societal/collective levels of judgment. Discussion of previous work in risk judgment will be discussed first, followed by work in efficacy perceptions.

Much research has clearly distinguished between personal and societal risk judgments (e.g. Coleman, 1993; Tyler & Cook, 1984). Tyler and Cook (1984) define personal level judgments as "beliefs about the respondent's own estimated risk" while societal level judgments are "belief's about the larger community and the condition of the community in relation to some social phenomena" (p. 693). Additionally, an early work in the fear appeals research line differentiated between risks related to personal, familial, and impersonal threats (Powell, 1965). These works note that personal and societal risk judgments are separate from each other – that personal risk judgments do not cause societal risk judgments, or vice versa. That is, a person may perceive there to be a high societal risk of global warming (i.e. an individual thinks that global warming causes hurricanes which pose a risk to Florida), but perceive low personal risk (i.e. the person

lives in Ohio, and isn't worried about hurricanes in Florida). Kahlor, Dunwoody, Griffin, and Neuwirth (2006) have noted that the problem of global warming is perceived as an impersonal risk for Americans, about which they often do not feel personally threatened, but which they think is a problem for society at large. Therefore, it is particularly important to consider both personal and collective risk perceptions.

Less work has examined efficacy at the collective levels; with little research studying both personal and collective efficacy in the same context (for exceptions see Fernandez-Ballesteros, Diez-Nicolas, Vittorio Caprara, Barbaranelli, & Bandura, 2002; Zaccaro, Bair, Peterson, & Zazanis, 1995). As previously mentioned, studies using the EPPM and RPA have traditionally utilized at personal efficacy. However, several studies using these theoretical perspectives have looked at perceptions of collective efficacy, examining the issue of crime and community safety (Davis & Henderson, 2003; Sampson, Raudenbush, & Earls, 1997). Davis and Henderson define this concept it as "a combination of neighborhood cohesion and informal social control" (p. 577). The present study defines collective efficacy more broadly as the belief of an individual that his or her country or community has the ability to implement social action that will effectively address the risk presented. Within the context of this study, collective efficacy perception can be conceptualized as the belief of an individual regarding the ability of the everyday citizens to take action that, if implemented, will prevent global warming and the risks associated with it. Fernandez-Ballesteros, et al. clarify that in a collective action setting (when many people must simultaneously perform a small action in order to get the desired outcome), efficacy perceptions should be measured at the *individual social level* (the ability of the individual to contribute to some social good) and at the *collective social*

level (the ability of the collective to bring about some social good). To use vocabulary consistent with the EPPM and RPA conceptualizations, collective action problems should focus on perceptions of *personal response* and *collective response* efficacy.

Finally, this study will examine legislative efficacy, or the ability of the government to pass and enforce legislation that will achieve a desired outcome. Specifically, in this context, it is an individual's perception of the ability of legislators to pass bills which will help to prevent global warming. This concept is similar to the broad notion of governmental efficacy (Doise, Spini, & Clemence, 1999) but is distinct in that it specifically examines contextual legislative efficacy (i.e. the ability of certain legislation to be successful, rather than if an individual perceives a governmental administration as efficacious in general). The concept of legislative efficacy is also similar to that of political trust. In fact, Rahn and Rudolph (2005) identify the ability of governments to produce effective policy outcomes as the first component of political trust. Again, however, legislative efficacy as conceptualized in the present study differs in that it is tied to specific policies rather than the government's ability as a whole.

1.6 Study Overview: Combining the RPA Framework with Personal, Collective, and Legislative Perceptions

It has been shown that people perceive both personal and collective risks and that their efficacy perceptions can be personal, collective, and legislative. The present study, therefore seeks to integrate these different levels of perception into the RPA framework in an effort to further understanding of fear appeals communication in different contexts. In this study individuals were placed into RPA groups based upon their risk and efficacy perceptions. As this study examines the personal and collective perceptions of

individuals, two different sets of RPA groups were categorized – *personal* RPA groups and *collective* RPA groups. Furthermore, efficacy perceptions in this study are conceptualized as being tailored to specific outcomes, such that efficacy towards individual behaviors is distinct from efficacy towards legislation. As a result, in addition to differentiating RPA groups according to the level of perception (*personal* or *collective*), it is necessary to differentiate RPA groups by outcome (*behavior intentions* or *legislative opinion*); therefore, individuals will be placed into two different RPA groups per level of perception – the *personal behavioral* RPA group, the *personal legislative* RPA group, the *collective behavioral* RPA group, and the *collective legislative* RPA group. Finally, this study introduces the concept of legislative efficacy. The final RPA group categorization will utilize the legislative efficacy perceptions of individuals and be called the *combined legislative* RPA group.

Across all of these sets of RPA groups, it is expected that the attitudinal group into which the participant falls will influence how likely he or she is to hold favorable attitudes about global warming legislation as well as the likelihood that he or she will implement various personal actions to prevent global warming, with the responsive group being most likely to support policy and report behavioral intentions, followed by the proactive, avoidant, and indifferent groups.

Finally, O'Connor, Bord, and Fisher (1999) find that knowledge about global warming is a significant predictor of behavioral intentions. Therefore, knowledge about the causes of global warming will be measured. It is expected that increased knowledge about the issue should result in a greater likelihood of supporting policy and intending to implement personal action. Additionally, it is expected that increased knowledge about

global warming should result in higher risk perceptions and higher efficacy; therefore, the effect of knowledge on outcomes should be at least partially mediated by risk and efficacy perceptions (e.g. Figure 2).

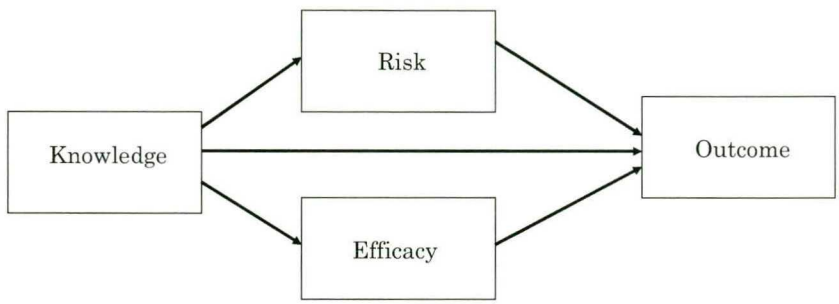

Figure 2. The proposed model predicting outcomes (policy attitudes and behavioral intentions) from risk and efficacy perceptions, with knowledge included.

Therefore, the following hypotheses are proposed which integrate the RPA framework with personal, collective, and legislative perceptions:

Behavioral Intentions:

H1: For both personal and collective perceptions, the responsive group will be the most likely to report intention to enact behaviors to prevent global warming, followed by the proactive group, then by the avoidant group, and finally, by the indifferent group.

Legislative Opinion

H2: For all perceptions (personal, collective, and combined), the responsive group will be the most likely to report support of global warming legislation, followed by the proactive group, then by the avoidant group, and finally, by the indifferent group.

Knowledge Mediation

H3: Across all sets of perceptions (personal, collective, and legislative), the effect of knowledge on policy support and behavioral intentions will be partially mediated by risk and efficacy perceptions.

CHAPTER 2

METHOD

2.1 Procedure and Participants

Participants were recruited from a national panel of email addresses provided by a private research company that specializes in online research. Participants were emailed a survey link and filled out the survey online. As the participants filled out the survey online, it was possible to analyze the length of time the participants took to complete the survey. Of the 959 participants who began, 62 participants did not complete the survey. Additionally, those participants who took under three minutes (65 participants) or over 120 minutes (4 participants) to complete the survey were excluded from analysis, leaving 828 participants. Additionally, 74 remaining participants declined to provide their age, and were subsequently disqualified for analyses (as age was used as a control variable). Therefore, 754 participants remained for final analyses. Of these, the age of participants ranged from 18 to 81 ($M = 42$, $SD = 13.6$), 64% male. The education level of the participants ranged from less than a high school diploma to a graduate degree; 4% of participants had less than a high school diploma, 22% had a high school diploma or GED, 35% had some college, 12% had an associates or technical degree, 17% had a bachelors degree, 4% had some graduate school, and 6% had a graduate degree. Level of income ranged from less than $15,000 to over $100,000; 13% of participants made less than

$15,000, 15% made between $15,000 and $24,999, 33% made between $25,000 and $49,999, 21% made between $50,000 and $74,999, 11% made between $75,000 and $100,00, and 6% made over $100,000. Additionally, 31% were Republican, 32% were Democrat, 3% identified with some other political party, and 34% had no party affiliation.

2.2 Measurement

2.2.1 Knowledge. Knowledge was measured with six questions designed by O'Connor, Bord, and Fisher (1999) to test the participant's ability to correctly identify causes of global warming. Individuals read the stem: "First, let's focus on some possible causes of global warming. Regardless of whether you know much about global warming, please indicate whether you think each of the following *is a cause* of global warming or *not a cause at all.*" Individuals read six possible causes of global warming and had to chose between "is a cause" and "not a cause at all." The accurate causes are: people driving their cars, people heating and cooling their homes, and pollution from businesses. The inaccurate causes are: the use of aerosol spray cans, nuclear power generation, and depletion of ozone in the upper atmosphere. The number of correct answers was totaled to create an index of knowledge about global warming.

2.2.2 *Outcomes.* Two sets of outcomes were measured: opinion about legislation and behavioral intent to perform some voluntary action. These outcomes were identified by O'Connor, Bord, and Fisher's (1999) examination of determinants of willingness to address climate change and have been modified only slightly to fit the purposes of this study. Four items were asked about individual's opinions of legislative options. All outcomes were measured with a six point Likert scale, with response options labeled

"strongly agree," "agree," "somewhat agree," "somewhat disagree," "disagree," and "strongly disagree." One item asked generally how individuals feel about global warming legislation ("I favor global warming legislation"). The second asked specifically about a policy to reduce businesses' air pollution ("I favor legislation that requires businesses to reduce their air pollution). The third asked about individuals' opinions of a gasoline tax ("I favor legislation that puts an extra tax on gasoline to encourage less driving"). The final legislative opinion question asked about support for government involvement in an international organization working to reduce air pollution ("I favor government support for a new international organization that would enforce international treaties to reduce air pollution"). Individual's responses to these four items were averaged to create an index of overall opinion towards global warming legislation; Cronbach's alpha for this scale was .830.

Four additional measures were asked about individual's intentions to perform various actions: "I intend to vote for candidates who support global warming legislation."; "I intend to use less air conditioning in the summer and less heat in the winter."; "I intend to replace older appliances with more energy efficient new models."; and "I intend to car pool, drive less, or use public transportation more." Responses to these four items were averaged to create an index of overall behavioral intentions; Cronbach's alpha for this scale was .835.

2.2.3 Personal susceptibility. Personal susceptibility was measured with three items tapping into the various possible consequences resulting from global warming. Participants read the following stem: Extreme weather events (e.g. tornados, hurricanes, droughts, floods, etc.) **resulting from global warming** may produce various

consequences. Please indicate the likelihood that each of the following consequences **of global warming** will affect you personally*:* (1) the loss of your personal possessions; (2) personal injury; and (3) financial costs. Responses were on a six point Likert scale labeled: "very likely," "likely," "somewhat likely," "somewhat unlikely," "unlikely," and "very unlikely." The answers to these three items were averaged[1]; Cronbach's alpha for this subscale was .920.

2.2.4 Personal severity. Personal severity was measured with three items tapping into the seriousness of the possible consequences resulting from global warming. Participants read the following stem: Now, please rate how serious you believe each consequence **of global warming** would be to you personally*:* (1) the loss of your personal possessions; (2) personal injury; and (3) financial costs. Responses were measured on a six point Likert scale labeled "extremely serious," "serious," "somewhat serious," and "not at all serious." The answers to these three items were averaged; Cronbach's alpha for this subscale was .913.

2.2.5 Overall personal risk perception. Overall personal risk perception was computed by adding up the scores for personal susceptibility and personal severity[2]. A mean split was run to divide individuals into high and low personal risk perception for classification into RPA groups (Mean = 6.7010, Minimum = 2, Maximum = 10, $SD = 2.0077$)[3].

2.2.6 Personal self efficacy. Personal self efficacy was measured with three items tailored to see if individuals could support the specific legislation policies, even when presented with information about the likely cost. Participants were asked to rate their level of

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[1] For personal susceptibility and all subsequent variable averages, participants who answered at least 2 of the 3 questions per subscale were included in analyses.

[2] The correlation between personal susceptibility and personal severity was .551, $r = .551$, $p < .000$.

[3] Individuals at the mean were placed in the high risk perception group.

agreement on a six point Likert scale ranging from "strongly agree" to "strongly disagree." Examples of items include: "I could support governmental involvement in a new international organization that would enforce international treaties to reduce air pollution, even if it would cost the United States 100 million dollars per year." and "I could support legislation that would require businesses to reduce their air pollution, even if it would likely raise the price of most things I buy, including food and clothing, by about 3% ($380 per year)." The answers to these three items were averaged to create a personal self-efficacy towards legislation scale; Cronbach's alpha for this subscale was .777. Self-efficacy was not measured for the behavioral intentions as it is reasonable to assume that little variability exists among individuals in their perceived ability to vote, regulate temperature, etc. (e.g. Fernandez-Ballesteros, et al., 2002).

2.2.7 Personal response efficacy. Personal response efficacy was measured with seven items corresponding to the outcome variables of interest. Participants were asked to rate their level of agreement on six point Likert scale ranging from "strongly agree" to "strongly disagree." Examples include: "If **I** would use less air conditioning in the summer and less heat in the winter, it would make a difference in combating global warming." and "**My support** of legislation that would require businesses to reduce their air pollution would make a difference in combating global warming." The four items related to behavioral intentions were averaged to create a personal behavioral response efficacy scale; Cronbach's alpha for this subscale was .874. The three items related to legislative opinion were averaged to create a personal legislative response efficacy scale; Cronbach's alpha was .846.

2.2.8 Overall personal efficacy perception. For legislative opinion, overall personal efficacy was computed by summing the self-efficacy and response-efficacy subscales. As personal self-efficacy was only measured for the legislative outcomes, personal response efficacy only was used for the behavioral intentions. Then mean splits were performed to facilitate placement into the appropriate RPA groups ($Mean_{Legislation} = 6.9852$, $Minimum_{Legislation} = 2$, $Maximum_{Legislation} = 12$, $SD_{Legislation} = 2.2532$; $Mean_{Behavior} = 4.0589$, $Minimum_{Behavior} = 1$, $Maximum_{Behavior} = 6$, $SD_{Behavior} = 1.1157$).

2.2.9 Collective susceptibility Collective susceptibility was measured with three items similar to the measure for personal susceptibility. The wording, however, was changed to emphasize collective vulnerability. Participants read the following stem: Extreme weather events (e.g. tornados, hurricanes, droughts, floods, etc.) **resulting from global warming** may produce various consequences. Please indicate the likelihood that each of the following consequences **of global warming** affecting residents of the United States as a whole: (1) the loss of property and possessions; (2) personal injury; and (3) financial costs. . Responses were on a six point Likert scale labeled: "very likely," "likely," "somewhat likely," "somewhat unlikely," "unlikely," and "very unlikely." The answers to these three items were averaged; Cronbach's alpha for this subscale was .955.

2.2.10 Collective severity. Collective severity was measured with three items similar to the measure for personal severity. The wording, again, was changed to emphasize the collective. Participants will read the following stem: Now, please rate how serious you believe each consequence **of global warming** would be to residents of the United State as a whole: (1) the loss of property and possessions; (2) personal injury; and (3) financial costs. Responses were measured on a six point Likert scale labeled "extremely serious,"

"serious," "somewhat serious," and "not at all serious." The answers to these three items were averaged; Cronbach's alpha for this subscale was .946.

2.2.11 Overall collective risk perception. Overall collective risk perception was computed by adding up the scores for collective susceptibility and collective severity[4]. A mean split was then run to divide individuals into high and low collective risk perception in order to place them into the appropriate RPA groups (Mean = 7.7324, Minimum = 2, Maximum = 10, *SD* = 2.0668).

2.2.12 Collective social efficacy. Collective social efficacy was measured with three items developed to measure individuals' perceptions of the ability of residents of the United States as a whole to enact the outcomes of support for specific legislation, despite cost barriers. Examples include: "I think most people in the United States could support government involvement with a new international organization that would enforce international treaties to reduce air pollution, even if it cost the United States 100 million dollars per year." and "I think most people in the United States could favor legislation that puts an extra tax on gasoline to encourage less driving, even if it would cause the price per gallon to increase by 60 cents." Participants were asked to rate their level of agreement on a six point Likert scale ranging from "strongly agree" to "strongly disagree." These three items were averaged to create a collective social efficacy for legislative support subscale; Cronbach's alpha for this subscale was .763. Again, as with personal perceptions, collective social efficacy for behavioral intentions was not measured.

[4] The correlation between collective susceptibility and collective severity was .502, $r = .502$, $p < .000$.

2.2.13 Collective response efficacy. Collective response efficacy was measured with seven items corresponding to the specific outcome variables for both legislative opinion and behavioral intentions. Participants were asked to rate their level of agreement on a six point Likert scale with statements like the following: "If most people supported legislation that would require businesses to reduce their air pollution, **their support** would make a difference in combating global warming." and "If **most people** in the United States would car pool, drive less, or use public transportation more, it would make a difference in combating global warming." The four items related to behavioral intentions were averaged to create a collective behavioral response efficacy scale; Cronbach's alpha for this subscale was .883. The three items related to legislative opinion were averaged to create a collective legislative response efficacy scale; Cronbach's alpha was .839.

2.2.14 Overall collective efficacy perception. In the same way that personal efficacy perception combined self and response efficacy for legislative opinions, overall collective efficacy perception averaged social and response efficacy perceptions. As collective self-efficacy was only measured for the legislative outcomes, collective response efficacy only was used for the behavioral intentions. Then mean splits were performed to facilitate placement into the appropriate RPA groups ($Mean_{Legislation} = 7.0700$, $Minimum_{Legislation} = 2$, $Maximum_{Legislation} = 12$, $SD_{Legislation} = 2.1798$; $Mean_{Behavior} = 4.3405$, $Minimum_{Behavior} = 1$, $Maximum_{Behavior} = 6$, $SD_{Behavior} = 1.1529$).

2.2.15 Legislative response efficacy. Legislative response efficacy was measured with three items that tap into participant's perception of the ability of the legislation to make a difference in the fight against global warming. Examples are: "If legislation that would

require businesses to reduce their air pollution were passed, it would make a difference in combating global warming." and "If the government would become involved in a new international organization that would enforce international treaties to reduce air pollution, it would make a difference in combating global warming." Participants were asked to rate their level of agreement on a six point Likert scale that ranges from "strong agree" to "strongly disagree." These three items were then averaged to create a legislative response efficacy subscale, Cronbach's alpha for this subscale was .830.

2.2.16 RPA groups. The present study measured perceptions of risk and efficacy in order to determine which of the four RPA groups (responsive, proactive, avoidant, and indifferent) each participant falls into. Participants were placed into five sets of RPA groups: *personal behavioral*, *collective behavioral, personal legislation, collective legislation* and *combined personal, collective, and legislative*, according to their corresponding risk and efficacy perceptions. For example, and individual above the mean for *personal* risk and below the mean for *personal* behavioral efficacy was placed into the *personal* behavioral **avoidant** RPA group for the *personal behavioral* RPA group set. If the same individual was above the mean for *collective* risk and above the mean for *collective* legislative efficacy, that individual was placed into the *collective* legislative **responsive** RPA group for the *collective legislative* RPA group set.

CHAPTER 3

RESULTS

3.1 General Overview and Data Analysis Procedures

The main purpose of this study was to determine if the expected hierarchy of RPA groups would hold for both personal and collective perceptions when predicting for both behavioral intentions and legislative opinions. It was predicted that the responsive RPA group would be the most likely to support policy or report behavioral intention, followed by the proactive group, then by the avoidant group, and finally, by the indifferent group.

In order to test whether this hierarchy held, separate regression models were constructed, predicting behavioral intentions and legislative outcomes respectively, with personal and collective RPA groups as independent variables while controlling for age, education, income, knowledge about global warming, and political party[5]. Significance tests for the coefficients of the RPA group were used to test the difference between the

[5] Categorization according to mean splits was utilized in this study in an effort to stay consistent with previous studies. Additionally, the RPA categorization is a useful heuristic to easily understand and communicate the expected relationships between the perceptions and outcomes. Rimal and Real (2003) defend this practice by stating that "we believe that knowing how the four groups differ on important variables is valuable information for public health campaigns...to the extent that significant differences still emerge [in spite of the categorization], we can increase our confidence in the central propositions advanced in this article" (p. 397). However, there are recognized issues with categorization of continuous data (e.g. Hayes, 2005; Irwin & McClelland, 2003). As a result, in addition to analyzing the data categorically, regressions were run predicting the outcomes from risk perceptions and efficacy perceptions, controlling for all of the same demographic variables to see if the substantive results differed. As expected, across all contexts, risk and efficacy perceptions were positively and significantly related to the outcomes. Additionally, as the RPA framework would suggest, the effect of efficacy was greater than that of risk. Substantively, therefore, the RPA categorization lends similar results to leaving the data continuous.

respective RPA groups and the reference group. Results for behavioral intentions will be discussed first, followed by results for legislative opinion.

3.2 Support for Hypothesis 1, RPA Groups and Behavioral Intentions

For behavioral intentions, the RPA group hierarchy was first tested with the personal RPA groups. It was found that as a whole, the personal behavioral RPA groups plus the control variables accounted for 37% of the total variance in behavioral intentions, Adjusted $R^2 = .374$, $F(11,683) = 30.563$, $p < .001$; with RPA groups uniquely explaining 27% of the variance in behavioral intentions, $\Delta R^2 = .272$, $F(3, 683) = 100.593$, $p < .001$. The regression formula was used to generate adjusted group means, and coefficient t-tests were used to statistically compare group differences. As expected, the personal behavioral responsive group had the highest adjusted mean for behavioral intentions ($M = 4.72$), followed by the personal behavioral proactive group ($M = 4.44$), the personal behavioral avoidance group ($M = 3.73$), and the personal behavioral indifferent group ($M = 3.30$). All differences between groups were significant (see Appendix B, Table 1 for differences).

The RPA group hierarchy was then tested with the collective RPA groups predicting behavioral intentions. It was found that as a whole, the collective RPA groups plus the control variables accounted for 38% of the total variance in behavioral intentions, Adjusted $R^2 = .381$, $F(11,678) = 37.849$, $p < .001$. The collective RPA groups uniquely explained 26% of the variance in behavioral intentions, $\Delta R^2 = .264$, $F(3,678) = 96.207$, $p < .001$. The regression formula was used to generate adjusted group means, and coefficient t-tests were used to statistically compare group differences. As expected, the collective behavioral responsive group had the highest adjusted mean for behavioral

intentions ($M = 4.66$), followed by the collective behavioral proactive group ($M = 4.46$), followed by the collective behavioral avoidance group ($M = 3.48$), and the collective behavioral indifferent group ($M = 3.38$). The only significant difference was between the proactive and avoidance groups (see Appendix B, Table 1 for differences).

3.3 Support for Hypothesis 2, RPA Groups and Legislative Opinion

Next, legislative opinion was predicted from the personal and collective RPA groups, again controlling for age, education, income, knowledge about global warming, and political party. It was found that as a whole, the personal legislative RPA groups plus the control variables accounted for 44% of the total variance in opinion towards global warming legislation, Adjusted $R^2 = .436$, $F(11,678) = 49.329$, $p < .001$; with RPA groups uniquely explaining 34% of the variance in legislative opinion, $\Delta R^2 = .342$, $F(3,678) = 139.257$, $p < .001$. The regression formula was used to generate adjusted group means, and coefficient t-tests were used to statistically compare group differences. As expected, the personal legislative responsive group had the highest adjusted mean for legislative opinion ($M = 4.71$), followed by the personal legislative proactive group ($M = 4.59$), the personal legislative avoidance group ($M = 3.60$), and the personal legislative indifferent group ($M = 3.20$). No significant difference was found between the responsive and proactive groups, although all other differences between groups were significant (see Appendix B, Table 1 for differences).

The RPA group hierarchy was then tested with the collective RPA groups predicting legislative opinion. It was found that as a whole, the collective RPA groups plus the control variables accounted for 45% of the total variance in legislative opinions, Adjusted $R^2 = .454$, $F(11,679) = 53.262$, $p < .001$. The collective RPA groups uniquely

explained 36% of the variance in legislative opinions, $\Delta R^2 = .356$, $F(3,679) = 150.242$, $p < .001$. The regression formula was used to generate adjusted group means, and coefficient t-tests were used to statistically compare group differences. As expected, the collective legislative responsive group had the highest adjusted mean for legislative opinion ($M = 4.04$), followed by the collective legislative proactive group ($M = 3.67$), the collective legislative avoidance group ($M = 2.90$), and the collective legislative indifferent group ($M = 2.36$). All differences were significant (see Appendix B, Table 1 for differences).

Finally, the hierarchy was tested with the combined RPA groups predicting legislative opinion. It was found that as a whole, the combined RPA groups plus the control variables accounted for 40% of the total variance in legislative opinions, Adjusted $R^2 = .401$, $F(11,657) = 41.577$, $p < .001$. The combined RPA groups uniquely explained 35% of the variance in legislative opinions, $\Delta R^2 = .302$, $F(3,657) = 112.044$, $p < .001$. The regression formula was used to generate adjusted group means, and coefficient t-tests were used to statistically compare group differences. No significant difference was found between the combined legislative responsive group ($M = 4.35$) and the combined legislative proactive group ($M = 4.90$) or between the combined legislative avoidance group ($M = 2.75$) and the combined legislative indifferent group ($M = 2.42$). However, the difference between the proactive and avoidance group was significant (see Appendix B, Table 1 for differences).

3.4 Support for Hypothesis 3, Knowledge Mediation

Additionally, it was of interest to examine the effect of knowledge about the causes of global warming on the outcomes of behavioral intentions and legislative

opinion. Specifically, it was predicted that knowledge about global warming would indirectly affect the outcomes (behavioral intentions and legislative opinion) through increased risk and increased efficacy. In order to test this hypothesis, the indirect effect of knowledge on the respective outcomes through risk was bootstrapped (e.g. Preacher & Hayes, 2004; Preacher & Hayes, in review). Bootstrapping randomly re-samples the original data with replacement to essentially create 1,000 datasets. This approach considers each case in the dataset as representative of other similar cases in the population. Therefore, randomly re-sampling this dataset as a proxy population allows an analysis of the bootstrapped sampling distribution of the indirect effect, which can be converted into confidence intervals for the true indirect effect. In this study, the analysis was run with personal, collective, and combined perceptions while controlling for gender, age, education, income, and party identification testing for the specific indirect effects of knowledge through risk and efficacy perceptions.

For personal behavioral perceptions, the estimate of the total effect of knowledge on behavioral intentions was .1374, with the true effect estimated to lie between .0738 and .2082 with 95% confidence. The specific indirect effect of knowledge on behavioral intentions through risk was estimated at .0015, not significantly different from zero, 95% CI = {-.0026, .0`11}. However, the estimate of the specific indirect effect of knowledge through efficacy on behavioral intentions was .1359, and the true specific indirect effect is estimated to lie between .0742 and .2063 with 95% confidence. It seems, therefore, that the effect of knowledge on behavior intentions is almost completely mediated by efficacy (see Appendix B, Table 2 for all estimates and confidence intervals).

For collective behavioral perceptions, the estimate of the total effect of knowledge on behavioral intentions was .1633, and the true effect is predicted to lie between .0952 and .2278 with 95% confidence. The specific indirect effect of knowledge on behavioral intentions through risk was estimated at .0014, not significantly different from zero, 95% CI = {-.0031, .0105}. However, the estimate of the specific indirect effect of knowledge through efficacy on behavioral intentions was .1299, and is between .0539 and .2064 with 95% confidence. It seems, therefore, that with the collective behavioral perceptions, again the effect of knowledge on behavior intentions is almost completely mediated by efficacy.

Next, the mediation hypothesis was tested with the legislative opinions outcome. First, personal legislative perceptions were tested. The estimate of the total effect of knowledge on legislative opinions was .1312, and the true effect is predicted to lie between .0517 and .2087 with 95% confidence. The specific indirect effect of knowledge through risk on legislative opinions was estimated at .0012, not statistically different from zeron, 95% CI = {-.0029, .0086}. The specific indirect effect of knowledge through efficacy, however, was estimated at .1299, statistically different from zero, 95% CI = {.0539, .2064}. The effect of knowledge on legislative opinions was again almost completely mediated through collective efficacy.

Collective legislative perceptions were tested next. The estimate of the total effect of knowledge on legislative opinions was .1141, and the true effect was estimated to lie between .0383 and .1855 with 95% confidence. The specific indirect effect of knowledge through risk on legislative opinions was estimated at .0103, with the true effect predicted to lie between .0002 and .0276 with 95% confidence. Therefore, in this context, it seems

that the effect knowledge is partially mediated by risk perceptions, although the specific indirect effect is small. The specific indirect effect of knowledge through efficacy was estimated to be .1038, with a 95% confidence interval of .0348 to .1689. Again, the effect of knowledge on the outcome of legislative opinion was almost completely mediated by efficacy, with only a small indirect effect through risk.

Finally, the mediation hypothesis was tested with combined personal, collective, and legislative perceptions. The estimate of the total effect of knowledge on legislative opinions was .1340, and the true effect was estimated to lie between .0631 and .2098 with 95% confidence. The estimate of the specific indirect effect of knowledge through risk on legislative opinions was .0039, however, that is not significantly significant from zero as the 95% confidence interval includes zero, 95% CI = {-.0002, .0169}. The specific indirect effect of knowledge through efficacy, however, was significant, estimated to be .1301 with a 95% confidence interval of .0625 to .2058. The effect of knowledge on legislative opinions was again almost completely mediated through collective efficacy.

CHAPTER 4

DISCUSSION

The purpose of this study was to assess whether individuals' levels of risk and efficacy would influence peoples' behavioral intentions and opinions about legislative options regarding global warming. It was also designed to explore whether in both behavioral intentions and legislative opinions, and across personal, collective, and combined perceptions, the *responsive* group was the most likely to indicate behavioral intentions and favor policy, followed by the *pro-active* group, the *avoidant* group, and the *indifferent* group. Finally, it was of interest to see what role knowledge about the subject of global warming would play in the outcomes of behavioral intentions and legislative opinion. Results suggest support for the hypothesized relationships between risk perceptions, efficacy perceptions, and outcomes. Additionally, it was discovered that influence of knowledge was almost completely mediated through individual's efficacy perceptions. This chapter will discuss the interpretations of these findings, their implications for future research, limitations of the present study, and applications of these findings for political communicators.

4.1 Interpretation of Findings, Strengths, Limitations, and Future Avenues of Research

4.1.1 Interpretation of RPA Framework Findings. Broad support was found for the RPA framework. It was found that the *responsive* group, those with high risk and high efficacy

perceptions, had the highest adjusted mean across all perceptions and both outcomes in all except for one context[6], $Personal_{Behavioral} = 4.72$, $Collective_{Behavioral} = 4.66$, $Personal_{Legislative} = 4.71$, $Collective_{Legislative} = 4.04$, $Combined_{Legislative} = 4.35$. In summary, these average numbers of 4 and 5 indicate that the members of this group tended to give an average response between "somewhat agree" and "agree" to the various outcome questions. It can be concluded, therefore, that the members of the responsive group followed the danger control path of addressing the risk through specific behaviors and supporting legislative options.

The *pro-active* group, those with low risk and high efficacy perceptions, consistently had the second highest adjusted means across all perceptions and both outcomes, $Personal_{Behavioral} = 4.44$, $Collective_{Behavioral} = 4.46$, $Personal_{Legislative} = 4.59$, $Collective_{Legislative} = 3.67$, $Combined_{Legislative} = 4.90$. In summary, this average score of about 4 to 5 indicates that members of this group tended to give answers between "somewhat agree" and "agree" on the specific outcome questions. They were supportive of legislation, and tended to agree that they intended to act, but less so than members of the *responsive* group. Therefore, it seems that individuals in the group follow the RPA framework's prediction of favoring policy and intending to perform actions because they believe that they will work, even though they do not feel the risk is highly threatening.

The *avoidant* group, those with high risk and low efficacy perceptions ranked third in the hierarchy of adjusted means, $Personal_{Behavioral} = 3.73$, $Collective_{Behavioral} = 3.48$, $Personal_{Legislative} = 3.60$, $Collective_{Legislative} = 2.90$, $Combined_{Legislative} = 2.75$. The

[6] In the combined legislative context the *proactive group* had a higher adjusted mean than the *responsive group*, although the difference was not statistically significant. Additionally, although for the remainder of the contexts, the *responsive group* had the highest adjusted mean, the difference between the *responsive* and *proactive groups* wasn't statistically significant for the collective behavioral and the personal legislative contexts. See table 1 for a visual summary of differences.

average numbers between 3 and 4 indicate that this group tended to range between average responses of "somewhat disagree" and "somewhat agree." The avoidant group seemed to follow the fear control path proposed by the EPPM; they felt threatened by the risk (as evidenced by high risk perception), but felt a low ability to alleviate the threat (as evidenced by low efficacy perception), leading to low intentions to perform specific behaviors and low support for policy.

Finally, the *indifferent,* those with low risk and efficacy perceptions, group ranked fourth in the hierarchy for all contexts (with the exception of collective behavioral perceptions), $Personal_{Behavioral} = 3.30$, $Collective_{Behavioral} = 3.38$, $Personal_{Legislative} = 3.20$, $Collective_{Legislative} = 2.36$, $Combined_{Legislative} = 2.42$. Across contexts, members of this group tended to answer "disagree" or "somewhat disagree" to all outcomes. It seems that members of this group didn't feel highly threatened by the risk of global warming and also did not feel like the legislative and behavioral options would alleviate what little risk they felt. As a result, they were not supportive of legislative or of implementing specific behaviors in their life.

The predictions made by the RPA framework were clearly borne out in the present study. It seems that the communication climate of fear appeals surrounding global warming has produced varying responses in the American public according to their perceptions of the threat of global warming and their perceptions of the efficaciousness of behaviors and legislation that would address the problem. This study has taken a theoretical perspective and literature that has mainly been utilized and examined in a personal, behavioral health context and extended it to a more macro, collective behavioral and public opinion, political context. If, as Altheide (2002), stipulates, fear is

progressively becoming a more dominant public perspective and frame through which we interpret political and social events, it is clear that this theoretical framework will have increasing utility in explaining the public's response to issues and legislation.

This study has argued and empirically demonstrated that the RPA framework is a useful tool for predicting behavioral intentions and legislative opinion and can extend beyond the personal, behavioral health context for which the theory was developed. However, bridging the context from the health arena to the political arena does offer several differences. One such difference is that according to the RPA framework, those with low risk perceptions and low efficacy perceptions are categorized as having an indifferent perspective – they are presumed to just not really care about the issue. While this interpretation makes sense in the health context that the RPA framework was developed for, it seems that when considering political issues it may be that individuals with low risk and low efficacy perceptions aren't just indifferent – they may be opposed to specific policy options and behavioral recommendations. In the specific context addressed in this study, it may be that individuals feel that global warming is only low to moderately threatening, and that furthermore, nothing can really be done about this low threat. This attitude could be characteristic of indifference. However, it may also be that individuals are convinced global warming is NOT occurring, and that, not only would proposed actions and policies not be efficacious, but completely unnecessary. This attitude would be more characteristic of opposition. This attitude of opposition is not inherent to the issue of global warming. It is probable that other political contexts that are couched in fearful terms (i.e. terrorism policy, illegal immigration policy, social security reform, etc.) would also have people with both indifferent and oppositional attitudes.

Future research that teased out the distinction between *indifferent* and *oppositional* attitudes of individuals who have low risk and efficacy perceptions may be helpful.

Another difference between personal health behaviors and macro political collective action and legislation is the relevance of collective perceptions. The contexts for which the EPPM and RPA framework were first developed focused on micro-health behaviors such as applying sun screen, practicing safe sex, and utilizing tractor safety, all of which are primarily limited to personal perceptions and ramifications. Political contexts, however, usually have a more macro-level perspective, and as a result, it becomes important to understand not only personal perceptions of risk and efficacy, but also perceptions of collective risk and efficacy. A key strength of this study is that it looks at both collective and personal-levels of risk and efficacy. By examining both personal and collective-level risk perceptions, the applications of EPPM and the RPA framework can be extended. Additionally, this approach is investigating these theoretical perspectives in a way that is more consistent with the recommendations found in the risk perception literature. Furthermore, by looking personal and societal-level perceptions of efficacy, this study reintroduces to the study of fear appeals the important concept of collective efficacy, which although present in early fear appeal research (e.g. Powell, 1965), appears to have been largely ignored by contemporary research in this area.

4.1.2 Interpretation of Findings about the Role of Knowledge. In addition to examining the relationship of risk and efficacy with the outcomes, this study investigated the relationship of knowledge about global warming to behavioral intentions and legislative opinion. Other authors (e.g. Kahlor, Dunwoody, Griffin, & Neuwirth, 2006; O'Connor, Bord, & Fisher, 1999) have theorized and found that increased knowledge about the

environment leads to increased risk perceptions, increased information seeking, and increased intentions to perform pro-environmental behaviors (these studies did not examine efficacy). Therefore, it was hypothesized that increased knowledge would lead to increased risk and efficacy perceptions, which would, in turn lead to increased behavioral intentions and legislative opinion. However, the expected indirect effects of knowledge through risk and efficacy were confirmed only for the specific indirect effect through efficacy. It seems that the ability to correctly identify causes of global warning is related to individual's beliefs about the efficaciousness of recommended actions and legislative options. In turn, efficacy perceptions directly related to the specified outcomes. In fact, across all contexts the effect of knowledge was almost completely mediated through efficacy perceptions, showing that knowledge had little direct effect on the outcomes.

The specific indirect effect through risk, conversely, was not confirmed. It may be, however, that this finding is an artifact of how knowledge about global warming was measured. Knowledge was measured using a scale that focused on identifying causes of global warming, not about scientist's predictions for the effects of global warming. Additionally, no items tapped into political knowledge about the issue (i.e. True/False "The United States has agreed to participation in the Kyoto treaty."). This scale was chosen because it has previously been used as a valid and reliable measure of knowledge about global warming (e.g. O'Connor, Bord, & Fisher, 1999). However, for the purposes of this study, it would have been advantageous to include a more comprehensive measure for knowledge. Future research that more fully tested for the relationship of knowledge to

risk perceptions, efficacy perceptions, and the outcomes of behavioral intentions and legislative opinion would be informative.

4.1.3 Limitations and Strengths. As with any attempt at empirical investigation, this study had several limitations, including the aforementioned knowledge subscale. Another limitation of this study was the measurement of collective efficacy perceptions. Factor analysis revealed that personal and collective efficacy perceptions loaded on the same factor, indicating that psychometrically, the measurement of these constructs did not adequately differentiate between personal and collective efficacy perceptions. Future work which specifically focuses on the measurement of collective efficacy is needed, specifically in contexts larger than small groups (e.g. Fernandez-Ballesteros, et al., 2002 for a discussion of the measurement of collective efficacy in small groups).

Additionally, this study used a non-experimental, cross-sectional questionnaire design. As a result, it is not possible to assess or assert causality between variables. While the theoretical justification for this study suggests that knowledge and risk and efficacy perceptions cause people to respond in varying manners to the atmosphere of fear surrounding the issue of global warming, it is not possible to empirically assess the causal nature of these relationships. Further work using experimental designs would allow for a more specific test of the nature of the causality.

However, this study also had a number of strengths. A key strength of this study is the range of participants. Although the sample was not random, participants were recruited from a national sample. Post-hoc analysis of the sample indicates that there was a wide range in all demographic categories. This sample renders the findings more credence and generalizability. An additional strength of this study is that it successfully

transferred a theory developed in the health context to show its usefulness in the political and public opinion context as well. Finally, this study extended the parameters of the RPA framework by demonstrating that the framework was applicable for personal, collective, and legislative perceptions.

4.1.4 Broader Implications and Applications for Political Communication. One of the strongest findings of this study was that efficacy perceptions had a sizable effect on behavioral intentions and support for policy. Therefore, the findings of this study seem to warrant an emphasis on the efficacy components of a message in public communication about political issues. That is, when respondents have high efficacy, they tend to hold more favorable opinions toward public policy than when they have low efficacy. However, the findings for risk perceptions do not parallel those of efficacy perceptions. Across all perceptions and contexts, the effect for efficacy was much stronger than of that for risk. In fact, in certain contexts (personal and collective behavioral), risk did not make a significant difference. Additionally, it was discovered that even when individuals perceive a risk to be low, they may still favor public policy if their efficacy perception is high. However, individuals who perceive the situation to be risky, but feel that nothing can be done about it (avoidant group), on average say that they disagree with statements that indicate support for public policy. As a result, it would seem that emphasizing efficacy components of the message may be wiser than emphasizing risk components.

Additionally, it was shown that the RPA hierarchy is a useful tool for predicting the political outcomes of individual behavioral intentions and support for policy. The hierarchy was useful in both outcomes for personal, collective, and combined perceptions. Furthermore, it may be that these RPA groups are useful categories for

audience segmentation and targeting. If a policy proponent is aware of the risk perceptions and efficacy perceptions that the intended recipients of the message hold, he or she is able to predict which groups will be most likely to favor the policy. Additionally, messages can be designed to emphasize different aspects of either the threat or the solution in an attempt to address the concerns most relevant to the audience. Rimal and Real (2003) note that future research could examine whether targeting messages results in resonance or compensation – that is, do audience members pay more attention to those messages with which they already identify, or do they pay more attention to those messages in areas where they lack (i.e. a person with low efficacy perceptions would pay more attention to a message with high efficacy components).

Overall, this study has contributed to an understanding of how the public reacts to an issue that is predominantly couched in fearful terms. The findings demonstrate that knowledge, risk perceptions, and efficacy perceptions all have relationships with behavioral intentions and opinion about legislation. Furthermore, this study has demonstrated that these perceptions can be measured for the personal, collective, and legislative perceptions.

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APPENDIX A

ILLUSTRATIONS OF GLOBAL WARMING FEAR APPEALS

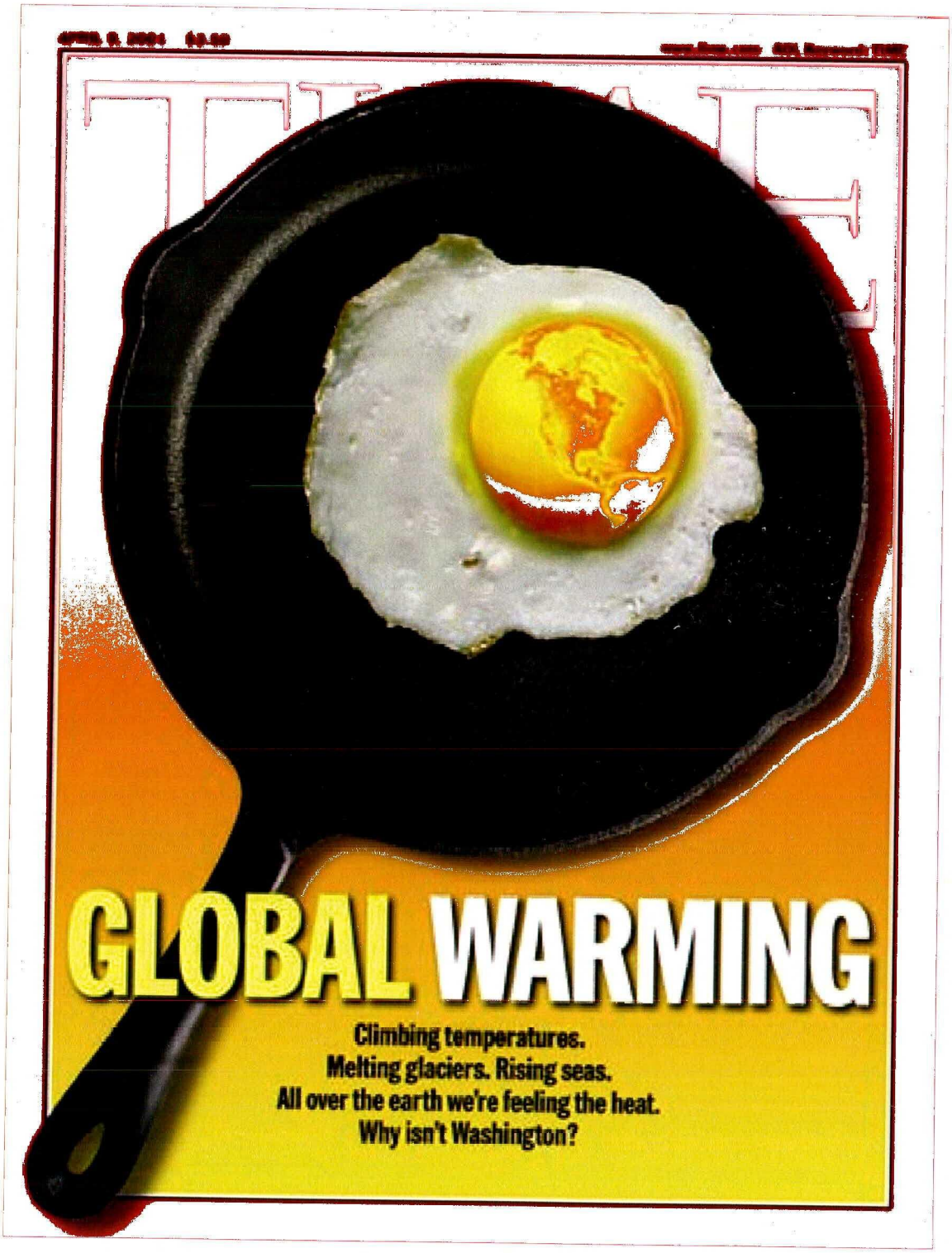

Figure 3. Time magazine cover for April 9, 2001.

Figure 4. Time magazine cover for April 3, 2006.

Figure 5. This Ad Council Campaign Commercial funded by the Environmental Defense Fund portrays global warming as a train headed for future generations.

APPENDIX B

TABLES OF RESULTS

Variables	*b*	*S.E.*	*t*(df)	*p*
Personal Behavioral Intentions				
Responsive Group vs. Pro-active Group	.274**	.103	2.668(683)	.008
Pro-active Group vs. Avoidant Group	.718***	.117	6.138(683)	.000
Avoidant Group vs. Indifferent Group	.431***	.103	4.176(683)	.000
Collective Behavioral Intentions				
Responsive Group vs. Pro-active Group	.203	.111	1.827(678)	.068
Pro-active Group vs. Avoidant Group	.979***	.137	7.161(678)	.000
Avoidant Group vs. Indifferent Group	.099	.114	.868(678)	.385
Personal Legislative Intentions				
Responsive Group vs. Pro-active Group	.120	.091	1.319(678)	.188
Pro-active Group vs. Avoidant Group	.985***	.109	9/005(678)	.000
Avoidant Group vs. Indifferent Group	.401***	.101	3.959(678)	.000
Collective Legislative Intentions				
Responsive Group vs. Pro-active Group	.372***	.096	3.897(679)	.000
Pro-active Group vs. Avoidant Group	.766***	.105	7.307(679)	.000
Avoidant Group vs. Indifferent Group	.537***	.093	5.767(679)	.000
Combined Legislative Intentions				
Responsive Group vs. Pro-active Group	.552	.428	1.260(657)	.208
Pro-active Group vs. Avoidant Group	2.147***	.484	4.435(657)	.000
Avoidant Group vs. Indifferent Group	.334	.237	1.409(657)	.159

*Significant at $\alpha = .05$; **Significant at $\alpha = .01$; ***Significant at $\alpha = .001$

Table 1. Results of Tests for Differences between RPA Groups

	Product of Coefficients		Bootstrapped 95% CI Bias Corrected and Accelerated	
	Point Estimate	*SE*	Lower	Upper
Personal Behavioral Perceptions				
Risk	.0015	.0031	-.0026	.0111
Efficacy	.1359	.0322	.0742	.2063
TOTAL	.1374	.0335	.0738	.2082
Collective Behavioral Perceptions				
Risk	.0014	.0031	-.0031	.0105
Efficacy	.1619	.0337	.0919	.2265
TOTAL	.1633	.0340	.0952	.2278
Personal Legislative Perceptions				
Risk	.0012	.0026	-.0029	.0086
Efficacy	.1299	.0393	.0539	.2064
TOTAL	.1312	.0403	.0517	.2087
Collective Legislative Perceptions				
Risk	.0103	.0067	.0002	.0276
Efficacy	.1038	.0346	.0348	.1689
TOTAL	.1141	.0370	.0383	.1855
Combined Legislative Perceptions				
Risk	.0039	.0035	-.0002	.0169
Efficacy	.1301	.0373	.0625	.2058
TOTAL	.1340	.0385	.0631	.2098

Table 2. Multiple Mediation Tests of the Specific Indirect Effects of Knowledge through Risk and Efficacy

APPENDIX C

QUESTIONNAIRE

Knowledge Scale

First, let's focus on some possible causes of global warming. Regardless of whether you know much about global warming, please indicate whether you think each of the following *is a cause* of global warming or *not a cause at all.*

	Yes, this is a Cause	Not a Cause
The use of aerosol spray cans.	☐	☐
Pollution from businesses.	☐	☐
People driving their cars.	☐	☐
Nuclear power generation.	☐	☐
Depletion of ozone in the upper atmosphere.	☐	☐
People heating and cooling their homes.	☐	☐

Personal Susceptibility

Extreme weather events (e.g. tornados, hurricanes, droughts, floods, etc.) **resulting from global warming** may produce various consequence. Please indicate the likelihood that the each of the following consequences **of global warming** will affect you personally.

Loss of your Personal Possessions

Very Likely	Likely	Somewhat Likely	Somewhat Unlikely	Unlikely	Very Unlikely
☐	☐	☐	☐	☐	☐

Personal Injury

Very Likely	Likely	Somewhat Likely	Somewhat Unlikely	Unlikely	Very Unlikely
☐	☐	☐	☐	☐	☐

Financial Costs

Very Likely	Likely	Somewhat Likely	Somewhat Unlikely	Unlikely	Very Unlikely
☐	☐	☐	☐	☐	☐

Personal Severity

Now please rate how serious you believe each consequence **of global warming** would be to you personally.

Loss of your Personal Possessions

Extremely Serious	Serious	Somewhat Serious	Not At All Serious
☐	☐	☐	☐

Personal Injury

Extremely Serious	Serious	Somewhat Serious	Not At All Serious
☐	☐	☐	☐

Financial Costs

Extremely Serious	Serious	Somewhat Serious	Not At All Serious
☐	☐	☐	☐

Collective Susceptibility

Extreme weather events (e.g. tornados, hurricanes, droughts, floods, etc.) **resulting from global warming** may produce various consequence. Please indicate the likelihood of each consequence of **global warming** affecting residents of the United States as a whole.

Loss of Property and Possessions

Very Likely	Likely	Somewhat Likely	Somewhat Unlikely	Unlikely	Very Unlikely
☐	☐	☐	☐	☐	☐

Personal Injury

Very Likely	Likely	Somewhat Likely	Somewhat Unlikely	Unlikely	Very Unlikely
☐	☐	☐	☐	☐	☐

Financial Costs

Very Likely	Likely	Somewhat Likely	Somewhat Unlikely	Unlikely	Very Unlikely
☐	☐	☐	☐	☐	☐

Collective Severity

Now please rate how serious you believe each consequence **of global warming** would be to residents of the United States as a whole.

Loss of Property and Possessions

Extremely Serious	Serious	Somewhat Serious	Not At All Serious
☐	☐	☐	☐

Personal Injury

Extremely Serious	Serious	Somewhat Serious	Not At All Serious
☐	☐	☐	☐

Financial Costs

Extremely Serious	Serious	Somewhat Serious	Not At All Serious
☐	☐	☐	☐

Personal Behavioral Response Efficacy

If **I** would vote for candidates who support global warming legislation, **my vote** would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If **I** would replace older appliances with more energy efficient new models, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If **I** would use less air conditioning in the summer and less heat in the winter, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If **I** would car pool, drive less, or use public transportation more, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Collective Behavioral Response Efficacy

If most people in the United States would vote for candidates who support global warming legislation, **their votes** would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If **most people** in the United States would replace older appliances with more energy efficient new models, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If **most people** in the United States would use less air conditioning in the summer and less heat in the winter, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If **most people** in the United States would car pool, drive less, or use public transportation more, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Personal Legislative Self-Efficacy

I could support legislation that would require businesses to reduce their air pollution, **even if** it would likely raise the price of most things I buy, including food and clothing, by about 3% ($380 per year).

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I could support legislation that puts an extra tax on gasoline to encourage less driving, **even if** would cause the price per gallon to increase by 60 cents.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I could support governmental involvement in a new international organization that would enforce international treaties to reduce air pollution, **even if** it would cost the United State 100 million dollars per year.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Collective Legislative Self-Efficacy

I think most people in the United States could support legislation that would require businesses to reduce their air pollution, **even if** it would raise the average price of most things they buy, including food and clothing by approximately 3% ($380 per year).

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I think most people in the United States could favor legislation that puts an extra tax on gasoline to encourage less driving, **even if** it would cause the price per gallon to increase by 60 cents.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I think most people in the United States could support government involvement with a new international organization that would enforce international treaties to reduce air pollution, **even if** it cost the United States 100 million dollars per year.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Personal Legislative Self-Efficacy

My support of legislation that would require businesses to reduce their air pollution would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If I supported legislation that puts an extra tax on gasoline to encourage less driving, **my support** would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If I would support government involvement in a new international organization that would enforce international treaties to reduce air pollution, **my support** would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Collective Legislative Self-Efficacy

If most people supported legislation that would require businesses to reduce their air pollution, **their support** would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If most people in the United States supported legislation that would put an extra tax on gasoline, **their support** would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If most people in the United States were to support government involvement in a new international organization that would enforce international treaties to reduce air pollution, **their support** would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Legislative Efficacy

If legislation that would require businesses to reduce their air pollution were passed, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

If legislation were passed that put an extra tax on gasoline, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

If the government would become involved in a new international organization that would enforce international treaties to reduce air pollution, it would make a difference in combating global warming.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Behavioral Outcomes

I intend to vote for candidates who support global warming legislation.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I intend to use less air conditioning in the summer and less heat in the winter.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I intend to replace older appliances with more energy efficient new models.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I intend to car pool, drive less, or use public transportation more.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Legislative Opinion Outcomes

In general, I favor global warming legislation.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I favor legislation that would require businesses to reduce their air pollution.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I favor legislation that puts an extra tax on gasoline to encourage less driving.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

I favor government support for a new international organization that would enforce international treaties to reduce air pollution.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
☐	☐	☐	☐	☐	☐

Demographics

Please indicate your gender.

Male	Female
☐	☐

Please indicate your age in years.

Please indicate the highest level of education you have completed.

Less than a high school diploma	High school diploma or GED	Some college	Associates or technical degree	Bachelors degree	Some graduate school	Graduate degree
☐	☐	☐	☐	☐	☐	☐

Please indicate which category represents your family's income in 2006.

Less than $15,000	$15,000 - $24,999	$25,000 - $49,999	$50,000 - $74,999	$75,000 - $100,000	Over $100,000
☐	☐	☐	☐	☐	☐

General speaking, how would you identify yourself politically?

Strongly Republican	Somewhat Republican	Somewhat Democrat	Strongly Democrat	Other political party	No party affiliation
☐	☐	☐	☐	☐	☐