COLLECTIVE GUILT FOR HARMING FUTURE INGROUP MEMBERS:
THE CASE OF AMERICAN IDENTITY AND GLOBAL WARMING

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Abstract

Three studies address whether people can experience collective guilt for present-day behavior that harms ingroup members in the future. In a correlational study, collective guilt mediated the relationship between perceived harm to future ingroup members on willingness to engage in behaviors that mitigate global warming. An experimental study extended these results by showing similar effects for actual behavior and pro-environmental attitudes. A final experiment extended the other studies by showing similar effects on political conservativism, particularly when global warming was seen as having only a minor impact. These studies suggest that shifting the emphasis from collective for past harm to collective guilt for future harm has important implications for research on collective emotions and pro-environmental behavior.

Introduction

Over the last decade, collective emotions research has proliferated in social

psychology. Building upon self-categorization theory (Turner, 1999) and appraisal

theories of emotion (Scherer, Shorr, & Johnstone, 2001), collective emotions research

argues that a salient social identity shifts the way that people appraise and respond to

emotionally-relevant events (Smith & Mackie, 2008). That is, a salient social identity

elicits appraisals of events based on their relevance for the ingroup, rather than for

individuals themselves (Smith, 1993). Furthermore, a salient social identity elicits

responses to events that regulate collective behaviors, rather than individual behaviors

(Maitner, Mackie, & Smith, 2007; Smith, Seger, & Mackie, 2007). The increased

emphasis on collective emotions provides a useful contribution to the psychology of

emotion, which has generally concentrated on individual determinants of emotional

experience and subsequent behavior (e.g., individual biology or appraisals; Oatley,

Jenkins, & Keltner, 2006).

One collective emotion that has received extensive attention is collective guilt

(see Branscombe & Doosje, 2004; Wohl, Branscombe, & Klar, 2006 for reviews).

Like personal guilt (see Lewis, 2008; Tracy & Robins, 2007b; Weiner, 2006 for

reviews), collective guilt is an aversive emotion that arises when people feel their self

is implicated in wrong-doing. However, unlike personal guilt, collective guilt arises in

response to events that are perceived as relevant for the collective self, rather than for

the personal self. Furthermore, unlike personal guilt, collective guilt fosters responses

aimed at regulating collective or group-based behavior (Maitner et al., 2007; Tajfel &

Turner, 1979), rather than personal behavior (Gross, 2007). Thus, what differentiates collective guilt from personal guilt is its basis in the collective self, as well as its role in strategies to manage the positivity of that self (e.g., Branscombe, Ellemers, Spears, & Doosje, 1999).

For instance, men can feel collective guilt for gender inequalities (Miron, Schmitt, & Branscombe, 2006) and White-Americans can feel collective guilt when considering their social privileges relative to Black-Americans (Powell, Branscombe, & Schmitt, 2005). Collective guilt occurs regardless of whether individuals have directly contributed to the inequalities themselves. Collective guilt also promotes behaviors to remedy the group's wrong-doing, such as apologizing or providing reparations to those harmed (Branscombe & Doosje, 2004)—even when these behaviors are relatively disconnected from relevant personal behaviors.

An important insight emerging from collective emotions research is that people's collective identities extend across time (Giner-Sorolla, Mackie, & Smith, 2007; Sani, 2008; see also Williams & Gilovich, 2008). People can feel collective emotions not only for present-day events, but also for events that occurred in other time periods (e.g., Wohl & Branscombe, 2005). This is particularly so for collective guilt—people can experience such guilt not only for their present ingroup's wrongs, but also for the past ingroup's wrongs. For instance, Dutch citizens reported increased collective guilt when their historical colonization of Indonesia was portrayed negatively (e.g., annexed land, abused/killed natives), than when it was portrayed positively (e.g., initiated laws, built schools; Doosje, Branscombe, Spears, &

Manstead, 1998). Given the flexible nature of self-categorization (Turner, Oakes, Haslam, & McGarty, 1994), collective identity forms a link between an ingroup's checkered past and its present-day members' emotional experiences (Adams, Biernat, Branscombe, Crandall, & Wrightsman, 2008).

Although collective emotions research has considered how collective identities extend into the past, it has not yet considered how collective identities extend into the future. This is not surprising, as emotions are typically considered as responses to events that have *already* occurred, rather than to events that have *not yet* occurred (e.g., Lewis, Haviland-Jones, & Barrett, 2008). Still, if collective identities do extend into the future, then it is plausible that people can feel collective emotions for events that are seen as likely to occur in the future. In the case of collective guilt, at least two categories of events could elicit this emotion: 1) considering the wrongs of future ingroup members or 2) considering the behavior of present-day ingroup members that become wrongs via their delayed or cumulative negative effects in the future. In both cases, collective guilt should motivate people to regulate collective behavior, such as attempting to forestall negative outcomes for future ingroup members.

The present research examines whether people can experience collective emotions in response to future ingroup wrongs. It focuses on collective guilt resulting from present-day ingroup behaviors that have negative outcomes in the future, and it does so in the context of American identity and global warming—the most pressing environmental concern of modern times (Oskamp, 2007). This research begins with a

discussion of collective guilt research, focusing on its primary findings and existing limitations, particularly in the context of global warming. This is next followed by a discussion of the connection between collective guilt and global warming. This will then be followed by a consideration of the controversy surrounding global warming, as well as the rationale behind collective guilt as a motivation for reducing global warming.

<div align="center">Previous Research on Collective Guilt</div>

Primary Empirical Findings

Several comprehensive overviews of the research on collective guilt already exist (Branscombe, 2004; Branscombe & Miron, 2004; Wohl et al., 2006). Given that such reviews exist, the present review will focus on the main theoretical premises derived from this empirical research. As in previous reviews, this review focuses on factors that elicit the experience of collective guilt, as well as the effects of collective guilt on relevant attitudes and behavior.

Previous research shows that two broad categories of factors are required to elicit collective guilt. The first broad category encompasses factors that promote the salience of one's social identity (or self-categorization as a member of a social group; Branscombe & Doosje, 2004). When social identity is salient, it shifts one's self-perception from the individual "I" to part of the collective "we," which makes the experience of collective guilt possible (see Turner et al., 1994). A number of factors can increase the salience of social identity (see Smith & Mackie, 2007 for a review). From the perspective of self-categorization theory (Turner et al., 1994), social identity

salience depends on two issues—the perceiver's *readiness* to self-categorize as a member of a social group, and the *fit* of a self-category to a particular social context. As a general rule, perceiver readiness is highest for people who strongly identify with a social group, and fit is highest in intergroup contexts in which social groups are behaving in a manner consistent with relevant group norms (Haslam, Powell, & Turner, 2000).

The second broad category of factors that elicit collective guilt encompass the degree of legitimacy associated with ingroup behavior (see Kelman, 2001; Tyler, 2006 for overviews on legitimacy). Since members of social groups are motivated to maintain a positive social identity (Tajfel & Turner, 1979; Turner et al., 1994), they generally perceive their ingroup's behavior as legitimate (i.e., right, valid, correct; Turner, 1991, 2005). Nevertheless, when group members perceive their ingroup's behavior as illegitimate (i.e., wrong, biased, error-prone), then they are motivated to resolve the "threat" to their social identity (Branscombe et al., 1999; Branscombe & Doosje, 2004; Branscombe, Doosje, & McGarty, 2002; Turner, 1991). Resolving social identity threats involves attempts to justify (legitimate) the group's behavior (Turner, 1991; see also Crandall & Eshleman, 2003; Stangor & Crandall, 2000). Whether collective guilt occurs and thus motivates regulation of collective behavior depends on whether the ingroup can sufficiently legitimize its guilt-worthy actions.

Research has shown that there are at least five methods for legitimizing the ingroup's behavior when faced with evidence of illegitimacy (Branscombe, 2004; Branscombe & Miron, 2004; Powell, Branscombe, & Schmitt, 2005; Schmitt, Miller,

Branscombe, & Brehm, 2008; Wohl et al., 2006). Two of these methods involve reaffirming the acceptability of ingroup behavior. First, ingroup members can deny the group's responsibility for any harm that has occurred. When the group is not responsible for the harm, then ingroup members have no basis for collective guilt. Second, ingroup members can explain that the group's behavior is legitimate—that it was grounded in sensible reasons. When the ingroup has behaved based on sound judgment, then ingroup members have no basis for collective guilt.

The other three methods involve reappraising events so as to make them seem more positive than they might otherwise. First, ingroup members can downplay the severity (and presumably the likelihood) of harm done by the group. When the amount of harm caused by the ingroup is minimal, then ingroup members have no basis for experiencing collective guilt. Second, ingroup members can focus on the benefits of ingroup behavior, rather than on its costs. When the ingroup has produced positive outcomes, then ingroup members have less basis for collective guilt. Third, ingroup members can suggest that the group is not capable of doing anything about the harm—repairing the damage is too difficult or would require excessive effort. These claims suggest that the group has little efficacy to repair the harms (Bandura, 2000; 2006), or the effort required outweighs its value (Schmitt et al., 2008). When the ingroup has limited resources (time, money, etc.) to address the outcomes of its behavior, this too can undermine the basis for collective guilt.

Although methods for reaffirming the acceptability of ingroup behavior might be straightforwardly related to legitimizing present-day behavior, it might be more

difficult to see how this is true for methods related to reappraising events to make them seem more positive. One might think that such appraisals are simply ways to *realistically* assess the threat to the ingroup—both degree of harm and the group's resources for dealing with it (e.g., Gross, 2007; Lazarus, 1999), and nothing more. This implies that people's views on what happened in other time periods are about what happened *then*, not about what is happening *now*.

For instance, if European Americans experience collective guilt for harm that occurred to Native Americans during the colonial period, then this guilt is about what happened during the colonial period. However, a subtly different but crucial point is argued here—the collective guilt that European Americans experience today would be largely mitigated if the group had previously taken sufficient steps to redress the harms that occurred in the past. Why? Because the ingroup would have resolved its residual sense of illegitimacy caused by failing to address its negative past treatment of Native Americans—in a sense, the two groups never reconciled. Thus, European Americans' present-day guilt is driven by present-day, illegitimate behavior—that is, their ingroup's ongoing failure to address the negative effects of its colonial past for Native Americans (Branscombe et al., 2002).

This point is essential when considering collective guilt and global warming. As discussed in detail later, many have denounced the evidence for global warming, preferring to represent the future as relatively unchanged from the present-day. These claims justify not changing present-day ingroup behaviors that harm the environment. Thus, what seems like realistic appraisals of events in other time periods are driven

by what ingroup members are doing (or not doing) *now*, not what happened (or will happen) *then* (see Halbwachs, 1992 or Moscovici, 2001 for similar arguments).

The distinction between types of legitimizations—reaffirming acceptability versus reinterpreting positivity—parallels the distinction between symbolic and realistic threats to the ingroup (Stephan & Stephan, 2000). Symbolic threats stem from threats to the ingroup's values and lifestyle, whereas realistic threats stem from threats to the ingroup's safety and well-being. Legitimizations that reaffirm ingroup acceptability seemingly resolve threats to the ingroup's values and lifestyle, whereas legitimizations that reinterpret positivity seemingly resolve threats to the ingroup's safety and well-being. As discussed in detail later, it is possible that these distinct types of legitimizations underlie distinct collective emotions. However, the present research conceptualizes "realistic threats" as legitimizations, and suggests that the distinction between symbolic and realistic threats might be problematic. Although perception is responsive to reality, it remains socially-mediated (Turner, 1991).

When ingroup members are unable to sufficiently legitimize their group's behavior, then they are likely to experience collective guilt (Branscombe & Doosje, 2004; Branscombe et al., 2002). Since collective guilt is aversive (Miron et al., 2006), people are motivated to engage in collective-level emotion regulation, in order to restore a positive social identity (e.g., Branscombe et al., 1999; Maiter et al., 2007; Mackie, & Smith, 2007; see also Gross, 2007). Such regulation may involve changes in one's attitudes toward the harmed group (e.g., reduced prejudice; Powell et al., 2005), as well as changes in behavior toward the harmed group (e.g., apologies,

reparations; Barkan, 2001; Doosje et al., 1998). More explicitly, given that one's collective self is implicated by ingroup harm-doing, people are motivated to adjust their collective attitudes and behavior in order to reduce collective guilt. Generally speaking, reductions in the legitimacy of harmful ingroup behavior can promote socially-beneficial changes in that behavior.

Limitations of Existing Research

Although research on collective guilt has made important contributions to our understanding of collective emotions, this work has three important limitations that are particularly relevant when thinking about collective guilt and global warming. The first limitation is that research has not considered the experience of collective guilt in the context of harms that occur in the future. A substantial body of research suggests that people's perspective on the future plays a significant role in how they regulate their present-day behavior (Higgins & Pittman, 2008; Liberman, Trope, & Stephan, 2007; Markus & Nurius, 1986; Molden & Dweck, 2006; Sanna & Chang, 2006). Nonetheless, it is important to point out that people can be *wrong* about how their present behavior will impact future events. While expediency might lead people to adopt favorable perspectives on how their behavior will impact future events (e.g., Todorov, Goren, & Trope, 2007), considering an unfavorable perspective on future events could elicit collective guilt. If so, then such guilt could elicit present-day changes in ingroup attitudes and behaviors that lead to a better future.

The second limitation of collective guilt research is that it has attended only to harm between groups, rather than harm within groups. The reason for this focus is

partly historical, as the social identity perspective developed out of research focused on intergroup conflict (e.g., Tajfel, Billig, Bundy, & Flament, 1971). Recent research based on the social identity perspective has ventured away from an exclusive concern with intergroup relations, to consideration of intragroup relations (Postmes & Jetten, 2006) and alternative topic domains (e.g., education, health; Haslam, Ellemers, Reicher, Reynolds, & Schmitt, in press). The reason for this focus is also partly due to the assumption that people are not motivated to, and do not, harm their own ingroup. Although this assumption might be generally true, it does not negate the fact that people's present behavior can have unintended consequences in the future (Merton, 1936). This holds even for the most well-meaning of present-day ingroup members. Accordingly, ingroup members could do substantial harm to their group by making poor decisions in the present, which might only come to be seen as such in hindsight. Indeed, it is plausible that future ingroup members might assign blame to present-day ingroup members based on the foreseeable effects of their conduct on the future (e.g., Lickel, Miller, Stenstrom, Denson, & Schmader, 2006; Page, 2006).

The third limitation of collective guilt research is that it focuses on a limited range of events that might provoke collective guilt—events that are sufficiently removed in time from the present or that are relatively rare among present-day group members (e.g., owning slaves, torturing natives, or murdering people based on their religious views). This limited range of events originates from the desire to provide firm evidence for the distinction between personal and collective emotions (Doosje et al., 1998). Such evidence is obtained by limiting research on collective emotions to

events or behaviors that people could not have engaged in themselves (e.g., Gordijn, Wigboldus, & Yzerbyt, 2001; Smith et al., 2007). People could not have possibly engaged in events before their own birth, and they are not likely to have engaged in events that are relatively infrequent among present group members. In both types of cases, people are not likely to have engaged in the behaviors, thereby substantiating the group-based nature of resulting emotional experiences. While researchers did not necessarily intend to limit the range of events that may elicit collective guilt (Doosje et al., 1998; see also Smith & Mackie, 2008), substantial empirical research differs from intentions and indeed focuses on such historical events—those that are severe, salient, and no longer occurring.

Nonetheless, limiting instances of collective emotion to only events or behaviors that lessen the potential for experiencing relevant personal emotions is potentially misleading, particularly when the events or behaviors under consideration are *commonly* performed by *present* ingroup members. This is so with Americans and global warming, where the vast majority of people personally do add to the problem. Notice that there is a difference between the quantity of vehicle emissions that one American produces and the quantity that three-hundred million Americans produce, though both collectively contribute to global warming. In order to distinguish between personal and collective guilt in this instance, it is important to consider that self-categorization transforms the meaning of "my" vehicle emissions as an individual into one small part of "our" pooled emissions as a social group (e.g., Tajfel, 1966; Turner et al., 1994). "Our" pooled emissions as a social group serve as

the basis for collective guilt, regardless of a given individual's contributions to global warming. Such transformation in the meaning of behavior occurs independent of the potential for experiencing relevant personal emotions.

<div align="center">*Connecting Collective Guilt and Global Warming*</div>

The Global Warming Controversy

Global warming refers to the gradual buildup of greenhouse gases in the Earth's atmosphere, which traps sunlight from space, thereby increasing atmospheric and oceanic temperatures (Dessler & Parson, 2006). According to the United Nation's Intergovernmental Panel on Climate Change (IPCC, 2007), if current warming trends follow their present course, then global warming will have detrimental effects on the planet. Such effects could include increased levels of drought, disease, flooding, and other harms. The public's increased recognition of global warming as an important social issue has been reflected in increased media coverage (National Geographic, 2008; Time, 2007), heated political discussion (Gore, 2007), and appeals for further research within psychology (Oskamp, 2007; Oskamp & Schultz, 2006; Reser, 2007).

Despite the strong evidence supporting the existence of global warming processes, people have been slow to respond. An important reason behind this failure to respond has been the strong doubt and uncertainty consistently fostered by those opposed to shifting present-day behaviors related to global warming (see Dessler & Parson, 2006 and Michaels, 2008 for lengthy discussions). These parties generate uncertainty about global warming by attacking the scientific evidence in several, inconsistent ways: claiming that the global climate is not changing in negative ways;

claiming that the global climate is changing in negative ways, but that this change is not caused by humans; claiming that the global climate is changing, but in positive not negative ways; or claiming that the global climate is changing in negative ways, but that repairing the damage is difficult or impossible at the present time (Dessler & Parson, 2006). Such doubts about global warming promote a conservative approach which, the existing evidence suggests, could be detrimental (IPCC, 2007).

It is important to recognize that these claims made by parties opposed to the validity of global warming resemble the methods for legitimizing ingroup behavior used to ward off collective guilt. If the evidence for global warming is portrayed as unsubstantiated or benign, then this legitimization reduces collective guilt and its motivation for changing present-day ingroup behavior related to greenhouse gases. Thus, global warming is less about future reality than about restoring unquestioned legitimacy to present-day ingroup behavior—behavior supporting the interests of parties opposed to the existing evidence (often non-scientists; Michaels, 2008).

Motivations for Reducing Global Warming

Researchers from a variety of disciplines have emphasized the importance of motivation in changing present-day ingroup behavior related to global warming (see Gifford, 2007; Moser & Dilling, 2007 for reviews). Countless motivations for pro-environmental behavior have been noted, including personal attitudes and values (Archer, Pettigrew, & Aronson, 1992; Clayton & Opotow, 2003; Nilsson, von Borgstede, & Biel, 2004; Schultz & Zelezny, 1999); normative pressures (Cialdini, 2003; Goldstein, Griskevicius, & Cialdini, 2007; Schultz, Nolan, Cialdini, Goldstein,

& Griskevicius, 2007); social support (Osbaldiston & Sheldon, 2003; Villacorta, Koestner, & Lekes, 2003); intrinsic satisfaction (De Young, 2000); knowledge (Seguin, Pelletier, Hunsley, & 1999); altruism (Hopper & Nielsen, 1991; Milfont, Duckitt, & Cameron, 2006); and many others. These motivations resemble those commonly discussed in social psychology (such as understanding, belonging, etc.; Fiske, 2003; Higgins & Pittman, 2008; Pittman & Zeigler, 2007), and undeniably overlap and interact in important ways (Hoffman, Gillespie, Moore, Wade-Benzoni, Thompson, & Bazerman, 1999). The present research does not deny the important role that other motivations could play in promoting the reduction of global warming, but rather focuses on the specific, previously unexplored role of collective emotion.

Collective guilt represents a particularly plausible motivation for engaging in behaviors aimed at reducing global warming. The reason behind this surmise lies in the controversy around global warming. Several of the arguments against scientific evidence for global warming closely resemble the legitimizations examined in past collective guilt research. Such legitimizations have been shown to undermine guilt, thus diminishing the motivation to change ingroup behaviors (Wohl et al., 2006). It appears plausible that such arguments are employed in order to minimize potential ingroup changes driven by collective guilt. Moreover, research on feeling responsible for environmental problems predicts engagement in pro-environmental behavior (Hines, Hungerford, & Tomera, 1986; Kaiser, Ranney, Hartig, & Bowler, 1999; Kaiser & Shimoda, 1999). Such findings seem consistent with research showing that

group responsibility for harm fosters collective guilt and reparative behavior (Wohl et al., 2006).

Nonetheless, other collective emotions could also motivate behaviors aimed at reducing global warming. One distinct possibility stemming from the global warming controversy is collective anxiety—dread about harm to the ingroup. Popular writers have drawn upon collective anxiety as a key motivator of behavior aimed at reducing global warming. For instance, former Vice-President Al Gore (2007) describes global warming as a "planetary emergency," a threat to future generations.

The motivational role of collective anxiety also finds support in empirical research. Wohl and Branscombe (2008a; in press) examined feelings of collective "angst" as stemming from events that are perceived as threatening the future of the ingroup. For instance, in one study, these authors manipulated whether residents of university dormitories believed that the university planned to eliminate the unique cultures that presently existed in their buildings, versus a control condition in which they read about upcoming events in the dormitories. Participants in the dorm threat condition experienced greater collective angst and indicated greater willingness to participate in a protest against the elimination of their unique culture. Collective angst resembles collective anxiety. It could stem from the threat that is presented by global warming and its consequences for the future ingroup. To the extent that this occurs, it could motivate action aimed at mitigating the effects of global warming.

Despite such similarities, it is important to understand the differing reasons why collective guilt and collective anxiety might motivate attitudes and behaviors

supportive of reducing global warming. Collective guilt and anxiety seemingly differ in that collective guilt is aimed at promoting important gains (e.g., doing whatever is needed to create a healthy environment for future ingroup members), while collective anxiety is aimed at preventing important losses (e.g., avoiding the harsh consequences of global warming for future ingroup members). This seems consistent with Molden, Lee, and Higgins (2008) who suggest that sadness entails promotion concerns whereas anxiety entails prevention concerns. Sadness is comparable to guilt in that both involve upward counterfactuals—thoughts about how situations could turn out better or could be improved in the future (Mandel, 2003). Given that promotion and prevention focus can elicit persistence toward relevant goals (Markman, McMullen, Elizaga, & Mizogucki, 2006), collective guilt and anxiety could elicit actions aimed at reducing global warming, albeit for different reasons.

More specifically, collective guilt motivates changes in present-day ingroup attitudes and behaviors so as to generate a better future for ingroup members, via the restoration of the natural environment—they promote ingroup *change*. Thus, ingroup members will be likely to adopt attitudes that facilitate reductions in global warming, such as stronger pro-environmental and politically liberal attitudes (Gifford, 2007; Oskamp & Schultz, 2005). Ingroup members will also be likely to engage in acts that promote reducing global warming, such as curtailing vehicle emissions and conserving energy (e.g., Winter & Koger, 2004). In contrast, collective anxiety motivates shifts in present-day ingroup attitudes and behaviors in order to create stability for future ingroup members, to circumvent the harsh consequences of global

warming on the future ingroup—they prevent ingroup change, by promoting ingroup *stability*. This suggests that a key difference between collective guilt and collective anxiety is that the former focuses more on the solution (what can be done), whereas the latter focuses more on the problem (what will happen). Still, neither collective guilt nor collective anxiety would occur unless global warming was perceived as potentially harmful to future ingroup members. Without harm, there would be little need or impetus for attitude or behavior change (Brehm, 1999; Schmitt et al., 2008).

Given that collective guilt and collective anxiety are both plausible motivators of behavior aimed at reducing global warming, this research examines the role of both emotions. If the global warming debate is a controversy of legitimacy, then collective guilt should play an important role in promoting behaviors aimed at reducing global warming (e.g., lowering emissions, conserving energy). Furthermore, collective guilt should play an important role in adjusting attitudes towards reducing global warming (e.g., environmentalism, liberalism). In contrast, if the global warming debate is about realistic appraisal of threat to future ingroup members, then collective anxiety should play an important role in promoting attitudes and behaviors aimed at reducing global warming. Based on claims arising from the controversy over global warming, the primary focus in this research is on the role of collective guilt.

Overview of Empirical Studies

The present research includes three studies that address several issues. First, this research examines whether people can experience collective guilt for present-day behavior that harms future ingroup members. Since perceiving harm has often been

associated with collective guilt, this research examined harm as a precursor to guilt in each of the studies—whether the likelihood that harm will occur as a result of global warming, or the severity of the harm that will occur. These different ways of looking at harm roughly parallel the public controversy over global warming, in which parties argue that global warming is either unlikely to occur, or unlikely to cause substantial harm (Dessler & Parson, 2006).

Second, this research examines the legitimizations that have been found to diminish the intensity of collective guilt (e.g., collective responsibility, collective efficacy). It examines legitimizations as mediators of the relationship of perceived harm on collective guilt. Since the controversy over global warming is potentially about legitimization of present-day ingroup behavior, rather the realistic appraisals of the threat posed by global warming, the legitimizations closely tied to reaffirming the legitimacy of present ingroup behavior should represent the most potent mediators of the perceived harm-collective guilt relationship. This theoretical model is depicted in Figure 1 (secondary model).

Third, this research examines whether collective guilt for the ingroup's greenhouse gas emissions mediates the relationship between perceived harm and attitudes and behaviors associated with reducing global warming. It examines willingness to engage in five types of behaviors that are commonly considered to reduce global warming (e.g., lowering vehicle emissions, conserving energy), as well as actual engagement in relevant behaviors (i.e., requesting more information about global warming, taking a sticker supporting global warming reduction). This research

also examines changes in attitudes that are associated with reducing global warming (i.e., pro-environmental attitudes, political liberalism). Furthermore, this research considers collective anxiety as an alternative motivation for changes in attitudes and behaviors related to global warming. Collective guilt should continue to mediate the relationship between perceived harm and global warming-related attitudes and behavior, after accounting for collective anxiety. This theoretical model is depicted in Figure 1 (primary model).

Study 1

Study 1 employed a correlational design to examine the relationship among legitimizations, collective emotions, and pro-environmental attitudes and behavior. Participants were presented with scientific information about global warming. They then completed measures of legitimization (harm likelihood), collective emotions (guilt and anxiety), and attitudes (pro-environmental) and behaviors (willingness to engage in five types of behaviors) related to global warming.

Two predictions are made for Study 1. First, perceiving greater likelihood of harm to future ingroup members will be associated with greater willingness to engage in behaviors that reduce global warming, and stronger pro-environmental attitudes. Second, collective guilt will mediate this relationship, even when collective anxiety is taken into account.

Figure 1

Theoretical Models Examined

Primary Model (Studies 1-3)
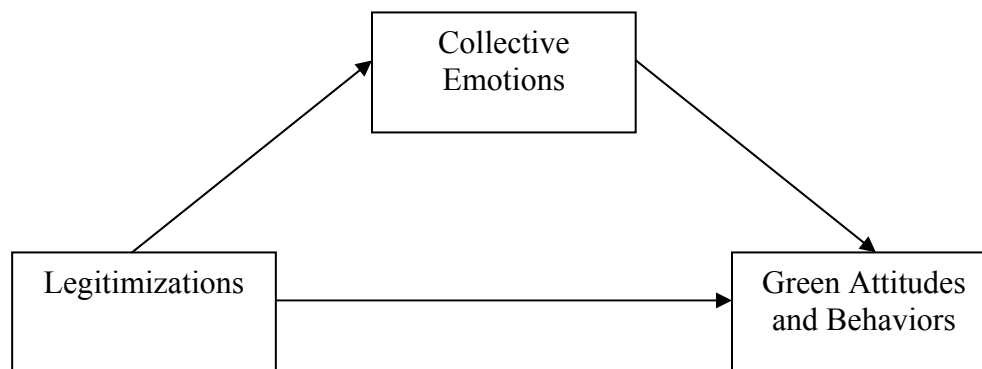
Secondary Model (Studies 2-3)
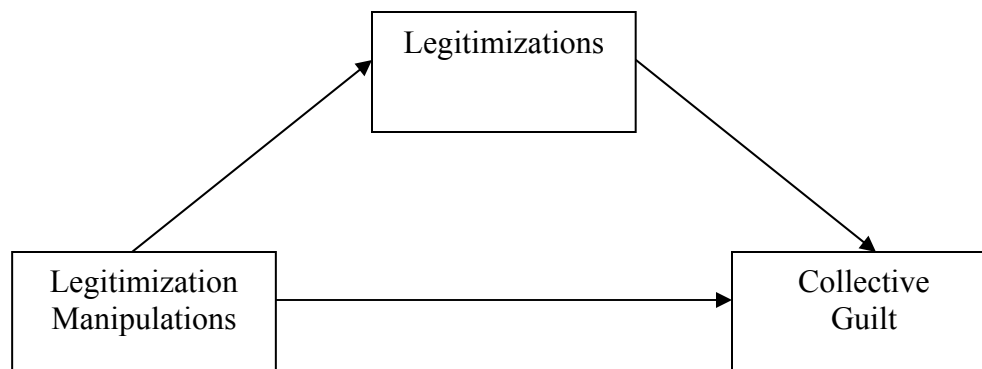
Note. Self-categorization is held constant throughout the studies.

Method

Participants and Procedure

Ninety-five college students (36 men and 56 women) participated in an internet-based survey in exchange for credit in their introductory psychology course. Participants indicated that they were American citizens in a prescreen questionnaire. The study booklet began with a half-page, factual summary of the scientific evidence on global warming and its expected impact on future Americans (IPCC, 2007). This summary suggested that humans are causing global warming, that global warming could negatively impact the lives of future Americans, and that the impact of global warming likely will be worse in the future. The summary is presented in Appendix A (p. 108). Instructions within the booklet clarified the meaning of "future Americans" as "Americans born 50 years from now." Participants then completed the dependent measures. Both the summary and the dependent measures maintained the salience of participants' social identity by repeatedly mentioning "American" in the text.

Dependent Measures

Participants first completed a measure of the likelihood of harm to future ingroup members. This measure consisted of six questions ($\alpha = .94$), such as "What is the likelihood that global warming will lead to suffering for Americans in the future?" Participants responded on scales ranging from 1 (not at all likely) to 5 (extremely likely). The complete list of questions is presented in Appendix C (p. 111).

Participants next completed measures of collective emotions adapted from previous research (Branscombe, Slugoski, & Kappen, 2004). They first completed a

measure of collective anxiety. This measure consisted of four questions ($\alpha = .86$), such as "To what extent do you feel nervous about the impact of global warming on Americans in the future?" They then completed a measure of collective guilt. This measure consisted of four questions ($\alpha = .87$), such as "To what extent do you, as an American, feel guilty for your contributions to global warming?" Participants responded to both measures on scales ranging from 1 (strongly disagree) to 7 (strongly agree). The complete list of questions is presented in Appendix C (p. 111).

Participants then completed measures of willingness to engage in five types of green practices: reducing vehicle emissions, conserving energy, engaging in green household activities, paying higher taxes to support global warming reduction, and participating in environmental advocacy. These measures were comprised of questions adapted from numerous internet sources addressing global warming (e.g., media and education-based public opinion polls, environmental lobby groups, federal agencies). Questions were placed into green practice measures based on their specific contribution to reducing global warming (e.g., behaviors in the emission questions reduce global warming through their impact on vehicle emissions). The green practice questions were prefaced by the statement, "In order to reduce the impact of global warming on future Americans, to what extent would you be willing to…" This clarified the reason for participants' willingness to engage in green practices.

The composition of the green practice measures are as follows. The emissions measure consisted of six questions ($\alpha = .81$), such as "To what extent would you be willing to increase the number of times that you carpool with friends or coworkers

(vs. drive) each week?" The energy measure consisted of ten questions ($\alpha = .82$), such as "To what extent would you be willing to adjust the thermostat in your residence so that it is a little warmer than you like it during the summer?" The household measure consisted of seven questions ($\alpha = .81$), such as "To what extent would you be willing to reduce your consumption of meat and dairy products?" The environmental tax measure consisted of six questions ($\alpha = .88$), such as "To what extent would you be willing to support a 20¢ per gallon gasoline tax, designed to encourage people to use less gasoline or obtain more fuel efficient vehicles?" The environmental advocacy measure consisted of twelve questions ($\alpha = .94$), such as "To what extent would you be willing to give a short presentation in an elementary school about global warming and how to reduce it?" Participants responded to all measures on scales ranging from 1 (not at all willing) to 5 (extremely willing). The complete list of questions is presented in Appendix E (p. 114).

Participants then completed a measure of environmental attitudes. This measure consisted of two questions ($\alpha = .70$), including "To what extent is the issue of global warming personally important to you?" and "How frequently have you personally taken steps to reduce global warming?" Participants responded to the first question on a scale ranging from 1 (not at all important) to 5 (extremely important), and to the second question on a scale ranging from 1 (never) to 5 (always).

Results

Analytic Strategy

The primary purpose of Study 1 is to examine whether either or both collective guilt and collective anxiety mediate the effects of perceived harm likelihood on green attitudes and practices. In order to accomplish this task, a series of multiple mediation analyses (with collective guilt and collective anxiety entered simultaneously) were estimated using the SPSS macro developed by Preacher and Hayes (2008). The Preacher and Hayes method differs from existing methods (e.g., Baron & Kenny, 1986) in two important ways. First, this method does not evaluate the significance of mediated effects using standard methods (Sobel, 1982) as they are unreliable in the context of modest sample and effect sizes. Instead, the macro employs a bootstrapping approach, calculating 95% bias-corrected confidence intervals for the significance of indirect effects. When the intervals do not contain zero, then a given mediated effect is significant. Five-thousand bootstrapped resamples were computed in all mediation analyses.

Second, the Preacher and Hayes method does not require the significance of each component beta coefficient (i.e., a_1 and $b_1 \ldots a_x$ and b_x) in order to consider a mediated effect significant. The significance of each beta coefficient is not considered evidence for mediation. Mathematically, a mediated effect *is* computed in a mediation analysis (i.e., $a_1 \times b_1 \ldots a_x \times b_x$) and this product might differ from what is implied by the significance of individual coefficients (e.g., $a_1 \times b_1$ might be significant when a_1 and b_1 are not or vice versa; K. J. Preacher, personal communication, June 10, 2008).

Thus, conventional approaches to mediation can elicit misleading results, particularly when using small samples. The present research includes individual beta coefficients, but confidence intervals are considered definitive for determining the significance of mediated effects.

In order to simplify the presentation of results for Study 1, two tables have been included. Table 1 presents descriptive statistics for the green attitude and practice measures, while Table 2 presents standardized beta coefficients for the mediation analyses. In addition, the correlations among legitimizations, collective emotions, and green attitudes and practices can be found in Appendix G (p. 118).

Vehicle Emissions

The relationship between perceived harm likelihood and willingness to reduce vehicle emissions was examined first. Participants who perceived higher harm likelihood were more willing to reduce vehicle emissions, $\beta = .40, p < .001$. However, when collective guilt and anxiety were included as mediators in the equation, harm likelihood was no longer related to willingness to reduce vehicle emissions, $\beta = .20, p = .18$.

Whether collective guilt and anxiety mediated the relationship between perceived harm likelihood and willingness to reduce vehicle emissions was examined next. First, collective guilt was a significant mediator, $CI_{.95} = (.08, .46)$. Participants who perceived higher harm likelihood experienced more collective guilt for their contributions as an American to global warming, $\beta = .65, p < .001$. Participants who experienced more collective guilt were more willing to reduce vehicle emissions, $\beta =$

Table 1

*Descriptive Statistics for Legitimizations, Collective Emotions,
and Green Attitudes and Practices*

	M	SD
Harm Likelihood	3.29	0.96
Collective Guilt	4.49	1.46
Collective Anxiety	4.79	1.59
Vehicle Emissions	3.54	0.79
Energy Conservation	3.30	0.67
Green Household Practices	3.73	0.73
Environmental Taxes	2.28	0.99
Environmental Advocacy	2.95	1.00
Environmental Attitudes	2.93	0.87

.37, $p < .01$. Second, collective anxiety was not a significant mediator, $CI_{.95} = (-.31,$

.24).

Energy Conservation

The relationship between perceived harm likelihood and willingness to

conserve energy was examined first. Participants who perceived higher harm

likelihood were more willing to conserve energy, $\beta = .48$, $p < .001$. However, when

collective guilt and anxiety were included as mediators in the equation, harm

likelihood was no longer related to willingness to conserve energy, $\beta = .12$, $p = .39$.

Table 2

Standardized Beta Coefficients for Mediations of Collective Emotions on Green Attitudes and Practices

	X→M	M→Y	X→Y₁	X→Y₂
Vehicle Emissions				
Collective Guilt	.65***	.37**	.40***	.20
Collective Anxiety	.77***	-.05	---	---
Energy Conservation				
Collective Guilt	---	.29*	.48***	.12
Collective Anxiety	---	.22	---	---
Green Household Practices				
Collective Guilt	---	.31*	.46***	.29*
Collective Anxiety	---	-.05	---	---
Environmental Taxes				
Collective Guilt	---	.32*	.34**	-.10
Collective Anxiety	---	.30	---	---
Environmental Advocacy				
Collective Guilt	---	.34**	.46*	-.02
Collective Anxiety	---	.33*	---	---
Environmental Attitudes				
Collective Guilt	---	.48***	.57***	.18
Collective Anxiety	---	.11	---	---

Note. X→M = harm likelihood on mediator; M→Y = mediator on green practice; X→Y₁ = harm likelihood on green practice excluding mediators; X→Y₂ = harm likelihood on green practice including mediators.

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

Whether collective guilt and anxiety mediated the relationship between perceived harm likelihood and willingness to conserve energy was examined next.

First, collective guilt was a significant mediator, $CI_{.95} = (.04, .36)$. Participants who perceived higher harm likelihood experienced more collective guilt for their contributions as an American to global warming, $\beta = .65$, $p < .001$. Participants who experienced more collective guilt were more willing to conserve energy, $\beta = .29$, $p < .05$. Second, collective anxiety was not a significant mediator, $CI_{.95} = (-.02, .37)$.

Green Household Practices

The relationship between perceived harm likelihood and willingness to engage in green household practices was examined first. Participants who perceived higher harm likelihood were more willing to engage in green household practices, $\beta = .46$, $p < .001$. However, when collective guilt and anxiety were included as mediators in the question, harm likelihood was no longer related to willingness to engage in green household practices, $\beta = .19$, $p = .18$.

Whether collective guilt and anxiety mediated the relationship between perceived harm likelihood and willingness to engage in green household practices was examined next. First, collective guilt was a significant mediator, $CI_{.95} = (.07, .38)$. Participants who perceived higher harm likelihood experienced more collective guilt for their contributions as an American to global warming, $\beta = .65$, $p < .001$. Participants who experienced more collective guilt were more willing to engage in green household practices, $\beta = .31$, $p < .05$. Second, collective anxiety was not a significant mediator, $CI_{.95} = (-.22, .15)$.

Environmental Taxes

The relationship between perceived harm likelihood and willingness to pay environmental taxes was examined first. Participants who perceived higher harm likelihood were more willing to pay environmental taxes, $\beta = .34$, $p < .001$. However, when collective guilt and anxiety were included as mediators in the equation, harm likelihood was no longer related to willingness to pay environmental taxes, $\beta = -.10$, $p = .48$.

Whether collective guilt and anxiety mediated the relationship between perceived harm likelihood and willingness to pay environmental taxes was examined next. First, collective guilt was a significant mediator, $CI_{.95} = (.05, .38)$. Participants who perceived higher harm likelihood experienced more collective guilt for their contributions as an American to global warming, $\beta = .65$, $p < .001$. Participants who experienced more collective guilt were more willing to pay environmental taxes, $\beta = .33$, $p < .05$. Second, collective anxiety was not a significant mediator, $CI_{.95} = (-.01, .49)$.

Environmental Advocacy

The relationship between perceived harm likelihood and willingness to engage in environmental advocacy was examined first. Participants who perceived higher harm likelihood were more willing to engage in environmental advocacy, $\beta = .46$, $p < .001$. However, when collective guilt and anxiety were included as mediators in the equation, harm likelihood was no longer related to willingness to engage in environmental advocacy, $\beta = -.14$, $p = .89$.

Whether collective guilt and anxiety mediated the relationship between perceived harm likelihood and willingness to engage in environmental advocacy was examined next. First, collective guilt was a significant mediator, $CI_{.95} = (.11, .37)$. Participants who perceived higher harm likelihood experienced more collective guilt for their contributions as an American to global warming, $\beta = .65, p < .001$. Participants who experienced more collective guilt were more willing to engage in environmental advocacy, $\beta = .34, p < .01$. Second, collective anxiety was also a significant mediator, $CI_{.95} = (.06, .50)$. Participants who perceived higher harm likelihood experienced more collective anxiety for harm done to future ingroup members, $\beta = .77, p < .001$. Participants who experienced more collective anxiety were more willing to engage in environmental advocacy, $\beta = .33, p < .05$.

Environmental Attitudes

The relationship between perceived harm likelihood and environmental attitudes was examined first. Participants who perceived higher harm likelihood expressed stronger pro-environmental attitudes, $\beta = .57, p < .001$. However, when collective guilt and anxiety were included as mediators in the equation, harm likelihood was no longer related to pro-environmental attitudes, $\beta = .18, p = .14$.

Whether collective guilt and anxiety mediated the relationship between perceived harm likelihood and pro-environmental attitudes was examined next. First, collective guilt was a significant mediator, $CI_{.95} = (.18, .47)$. Participants who perceived higher harm likelihood experienced more collective guilt for their contributions as an American to global warming, $\beta = .65, p < .001$. Participants who

experienced more collective guilt expressed stronger pro-environmental attitudes, $\beta =$ .48, $p < .001$. Second, collective anxiety was not a significant mediator, $CI_{.95} = (-.10, .27)$.

<div align="center">Discussion</div>

The results of Study 1 provide support for the notion that people can feel collective guilt in response to present-day behaviors that potentially harm future ingroup members. As expected, increased likelihood of harm to future ingroup members was associated with increased levels of collective guilt. This is consistent with previous research showing that increased severity of harm can elicit increased collective guilt, particularly when the harm occurs to those categorized as ingroup members (e.g., Branscombe & Miron, 2004). Feeling collective guilt for future harm is perhaps most common for harm stemming from the unintended consequences of present-day behaviors, which seems particularly likely to befall ingroup members.

Furthermore, increased likelihood of harm to future ingroup members was associated with increased willingness to engage in the behaviors aimed at reducing global warming and on environmental attitudes. Collective guilt mediated this relationship—for all five types of behaviors, as well as pro-environmental attitudes. This suggests that the perceived likelihood of harm to future ingroup members affects green attitudes and practices via collective guilt for the ingroup's contributions to greenhouse gas emissions. The mediating role of collective guilt held even when collective anxiety was accounted for in the analyses. In contrast, collective anxiety mediated the effects on only environmental advocacy. These results seem consistent

with past research on collective guilt showing that it motivates changes in behavior (e.g., apologies or reparations) and attitudes (e.g., reduced racism) in response to harm caused by the ingroup. This study also offers initial evidence that collective guilt might be useful in motivating attitudes and behaviors that promote reducing global warming.

The present study also provides some evidence against a negative state relief interpretation of the findings (see Batson, Ahmad, Powell, & Stocks, 2008 for a review). Given that collective guilt played a broader mediating role than collective anxiety, it is unlikely that participants simply experienced a general negative affective state (as it would presumably be reflected on *both* emotion measures) that elicited changes in global warming-related attitudes and behaviors. Differential emotion, rather than undifferentiated negativity, seemed to be primary in the present research.

Based on existing research, it is interesting that collective anxiety did not have a broader association with attitudes and behaviors related to reducing global warming. One potential explanation for the absence of this result is that collective anxiety is more likely to occur when the negative outcome is less psychologically distant in time (see Liberman, Trope, & Stephan, 2007 for a review). That is, the prevention focus implied in collective anxiety is to reduce impending harm to the future ingroup. However, in the present study, harm is defined as occurring to Americans in fifty years. This makes the harm less psychologically immediate than if the harm were to occur to Americans in twenty years. Although the relationships between prevention and promotion focus, collective emotions, and time as psychological distance are

beyond the purposes and scope of the present investigation, this research examined the issue in one small way. In Study 2, the definition of future Americans was changed from fifty to twenty years, which should bolster any effects of collective anxiety.

The results of Study 1 have at least three important limitations. The first limitation is the use of a correlational design. Although the hypotheses have a clear directional order, definitive conclusions about the direction of causality cannot be drawn given the nature of these data. It is certainly possible that alternative causal orders or potentially important variables need to be accounted for to fully understand the results. There are reasons to doubt some of these alternative interpretations on the basis of previous theory and measurement order, but the general point remains valid. Study 2 moves beyond this limitation by employing an experimental design.

The second limitation concerns the construct validity of the collective guilt measure. Although the measure was derived from previous research (Branscombe et al., 2004), it is possible that the measure did not actually capture collective guilt, but rather personal guilt. This potential issue stems from whether participants focused on the part of the measure that read "as an American" or "my contributions"—the former appears more collective, whereas the latter appears more individual. This potentially ambiguous wording is corrected in Study 2, where a new measure of collective guilt is employed.

The final limitation of Study 1 is that the green practice measures assess only *willingness* to engage in behavior, not *actual* behavior. Research has long shown that

there is a difference between experiencing the motivation to engage in behavior, and actual behavior (Kruglanski & Higgins, 2007). Moreover, researchers have repeatedly called for increased attention to measuring actual behavior, rather than simply using self-reports (Baumeister, Vohs, & Funder, 2007). Thus, the role of collective guilt in motivating green practices would seem more compelling if people engaged in bona fide behavior following this emotional experience. As a result, Study 2 includes two measures that move collective guilt research toward investigating actual behavior.

Study 2

Study 2 employed an experimental design to examine the effects of perceived ingroup stability and change. Recall that if the ingroup is likely to remain the same in the future (e.g., in terms of values, lifestyles, institutions; Sani, 2008) despite global warming, then this reduces the urgency for addressing global warming. The effects of perceived ingroup stability and change are examined for legitimizations, collective emotions, and attitudes and behaviors associated with global warming reduction.

Since the global warming debate involves a question about whether the lives of future ingroup members will be different with global warming, even when faced with clear evidence that they will be different, the present study manipulated general perceptions of ingroup stability and change before presenting the scientific evidence about global warming. These perceptions of stability and change were *not* explicitly connected to the effects of global warming, but rather were about the ingroup more generally. Participants then completed measures of legitimizations (likelihood of harm to the future ingroup, and collective legitimacy, responsibility, and efficacy),

collective emotions (guilt and anxiety), and green attitudes and practices (including an opportunity to request additional information about global warming, as well as to to take a sticker in support of reducing global warming).

Three predictions are made for Study 2. First, perceived ingroup stability will weaken willingness to engage in behaviors that mitigate global warming, engagement in such behaviors, and pro-environmental attitudes. When people see their ingroup's future as comparable to its present, this will lead them to discount the consequences of global warming for the future ingroup—that is, perceiving stability for the future ingroup legitimizes present-day ingroup behaviors that contribute to global warming. Second, collective guilt will mediate the effects of perceived ingroup stability and change on pro-environmental attitudes and behaviors, even when collective anxiety is accounted for. When the future is going to remain the same for the ingroup, then its present greenhouse gas emissions will seem legitimate, mitigating collective guilt.

Third, legitimizations tied to reaffirming the acceptability of present ingroup behavior (collective legitimacy, collective responsibility) will most strongly mediate the effects of perceived ingroup stability on collective guilt. This follows from the suggestion that the global warming controversy is more about the legitimization of present ingroup practices than it is about realistic appraisal of the threat that global warming poses for future ingroup members. If global warming debates are about legitimization rather than real threat, then increased perceptions of ingroup stability on reductions in green attitudes and practices will be mediated by decreased responsibility for the negative effects of global warming and increased legitimacy of

ingroup greenhouse emissions. That is, if the future is going to be largely the same, then there is little to feel responsible for, and polluting the planet's atmosphere is acceptable—the need and impetus for reducing global warming is diminished.

Method

Participants and Procedure

One-hundred and thirty-three college students (75 men and 58 women) participated in this study in exchange for course credit. Participants indicated their American citizenship in a prescreen questionnaire. They completed the study in groups of no more than twelve participants. A research assistant informed participants that the study was about "different aspects of American society" and handed them a printed booklet drawn from a previously randomized pile. The first page of the booklet manipulated perceptions of stability or change in the future ingroup. In the stability condition, participants were asked to describe three important similarities between present-day and future Americans. That is, they were asked to state how life will be the same for Americans in the future. In the change condition, participants were asked to describe three important differences. That is, they were asked to state how life will be different for Americans in the future. In a control condition, the booklets did not contain a manipulation page. The instructions specified the meaning of future Americans as "Americans in 20 years." Afterwards, participants completed a check on the manipulation.

Following the manipulation check on perceived ingroup stability and change, participants read the factual summary about global warming and its consequences for

future Americans from Study 1. Participants then completed the dependent measures.

As in Study 1, booklets maintained the salience of participants' social identity by

repeatedly mentioning "American" in the text. When participants completed their

booklets, they handed them to the research assistant. The assistant then administered

the behavioral measures. Participants received a debriefing statement as they left the

room. Three participants (two men and one woman) were excluded from the analyses

as they did not finish a significant portion of their booklets.

Dependent Measures

Participants first completed a manipulation check on perceived stability and

change. This measure consisted of two questions ($\alpha = .78$) that asked "How similar do

you think Americans today and Americans in the future will be to each other?" and

"How different do you think Americans today and Americans in the future will be to

each other?" The latter question was reverse-coded. Participants responded on scales

ranging from 1 (not at all) to 5 (extremely). They then completed the measure of

likelihood of harm to future ingroup members from Study 1 ($\alpha = .94$).

Participants then completed measures of collective emotions. They first

completed the measure of collective anxiety from Study 1 ($\alpha = .93$). Participants next

completed a new measure of collective guilt. This measure consisted of four

questions ($\alpha = .92$), such as "To what extent do you feel guilty that Americans today

contribute to greenhouse gas emissions (by driving automobiles, consuming

electricity, and in other ways)?" See Appendix D (p. 113) for the full collective guilt

measure. Participants responded on scales ranging from 1 (strongly disagree) to 7

(strongly agree). They then completed the five measures of willingness to engage in green practices from Study 1: vehicle emissions ($\alpha = .85$); energy conservation ($\alpha = .91$); green household practices ($\alpha = .87$); paying environmental taxes ($\alpha = .87$); and engaging in environmental advocacy ($\alpha = .94$).

Participants next completed three new legitimization measures. First, they completed a measure of collective responsibility. This measure consisted of three questions ($\alpha = .94$), such as "To what extent do you believe that Americans today are largely responsible for the effects of global warming?" Second, participants completed a measure of the legitimacy of ingroup behavior. This measure consisted of three questions ($\alpha = .90$), such as "To what extent do you believe it is wrong that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?" Third, participants completed a measure of collective efficacy. This measure consisted of four questions ($\alpha = .99$), such as "To what extent do you believe that if Americans today worked together, then they could reduce the impact of global warming on Americans in the future?" See Appendix C (p. 111) for a complete list of questions. Participants responded to these three measures on scales ranging from 1 (strongly disagree) to 7 (strongly agree). The legitimizations were measured after collective guilt, rather than before, due to concerns that they might foster reactivity or suspicion. Participants then completed the measure of environmental attitudes from Study 1 ($\alpha = .79$).

Once participants completed their booklets, they approached the research assistant sitting at a table in the front of the lab room. As each participant handed in

their booklet, the assistant asked the participant whether they were interested in taking a sticker to support reducing global warming. The sticker was two inches in diameter, in the shape of an octagon, with a dark green background and white letters. It simply read "Stop Global Warming!" The assistant subtly recorded the participant's behavioral choice—to take the sticker or not—on their booklet. After the participant made this choice, the assistant then asked if they were interested in signing up to receive an email from the researchers containing more information about global warming. Participants wrote their email addresses on a signup sheet that was later used to match emails to participants using the departmental research system. All email addresses provided were successfully matched to participants.

Results

Analytic Strategy

Study 2 was designed to examine whether collective emotions mediated the effects of perceived ingroup stability and change on green attitudes and behaviors, as well as whether legitimizations mediated the effects of ingroup stability and change on collective guilt. To examine these issues, analysis of variance was conducted on all measures except the behavioral measures (sticker and email), for which logistic regression was conducted. Afterwards, mediation analyses were conducted using the procedures outlined in Study 1, with one exception. The Preacher and Hayes (2008) macro cannot be used with dichotomous outcome measures. Thus, the mediations for the behavioral measures employ a different approach for obtaining the bootstrapped confidence intervals (MacKinnon & Dwyer, 1993; Selig & Preacher, 2008). For the

mediation analyses, the manipulation of ingroup stability and change was coded

stability = 0 and change = 1, while the behavioral measures were coded as did not

perform behavior = 0 and did perform behavior = 1.

In order to simplify the presentation of results for Study 2, two tables have

been included. Table 3 presents descriptive statistics for the green attitude and

practice measures, while Table 4 presents standardized beta coefficients for the

mediation analyses. In addition, the correlations among legitimizations, collective

emotions, and green attitudes and practices can be found in Appendices H-I (pp. 120-

122).

Manipulation Check

Analysis of variance. The effects of ingroup stability and change on the

manipulation check were examined using a one-way ANOVA. The main effect of

ingroup stability was significant, $F(2, 126) = 8.88$, $p < .001$. Participants in the

stability condition perceived more similarity between the present-day and future

ingroup ($M = 3.45$, $SD = 0.60$) than those in the control condition ($M = 2.91$, $SD =$

0.73), $p < .001$ or the change condition ($M = 3.04$, $SD = 0.57$), $p < .01$. Perceived

similarity between the present-day and future ingroup did not differ among

participants in the control and change conditions, $p = .35$. When the present and

future ingroup are similar, this suggests that the ingroup will remain largely the same

in the future.

The absence of a difference between the control and change conditions is not

surprising, as people are likely to assume that the future will be different than the

present (Perkins, 2001). Indeed, the control and change conditions did not differ on *any* of the dependent measures. Given these results, the control and change conditions were collapsed in order to examine their effects relative to the stability condition. The "change condition" will now refer to the collapsed control and change condition. As suggested earlier, when the ingroup's way of life will remain stable into the future, then there is little need for reducing global warming. However, when the ingroup's way of life will change in future, there is more need for reducing global warming.

Legitimizations for Present Ingroup Behavior

  Analysis of variance. The effects of ingroup stability and change on legitimizations for present-day ingroup behavior were examined using a one-way ANOVA. First, the legitimizations that attempt to reaffirm the acceptability of ingroup behavior were examined. For collective responsibility, the main effect of ingroup stability and change was significant, $F(1, 128) = 5.38, p < .05$. Participants in the change condition perceived more collective responsibility for the effects of global warming ($M = 4.57, SD = 1.48$) than those in the stability condition ($M = 3.92, SD = 1.56$). For legitimacy, the main effect of ingroup stability and change was significant, $F(1, 128) = 7.69, p < .01$. Participants in the change condition perceived that the ingroup's greenhouse gases were less legitimate ($M = 3.33, SD = 1.26$) than those in the stability condition ($M = 4.03, SD = 1.53$).

  Second, the legitimizations that involve portraying global warming in a positive manner were examined. For harm likelihood, the main effect of ingroup stability and change was significant, $F(1, 128) = 5.39, p < .05$. Participants in the

Table 3

Descriptive Statistics for Legitimizations, Collective Emotions, and Green Attitudes and Practices by Perceived Ingroup Stability and Change

	Ingroup Stability		Ingroup Change	
	M	*SD*	*M*	*SD*
Legitimizations				
Harm Likelihood	2.93$_a$	1.00	3.33$_b$	0.88
Collective Responsibility	3.92$_a$	1.56	4.57$_b$	1.48
Collective Legitimacy	4.03$_a$	1.53	3.33$_b$	1.26
Collective Efficacy	5.59$_a$	1.47	5.96$_a$	1.22
Collective Emotions				
Collective Guilt	3.75$_a$	1.52	4.56$_b$	1.47
Collective Anxiety	4.26$_a$	1.69	4.88$_b$	1.36
Green Attitudes and Practices				
Vehicle Emissions	3.20$_a$	0.96	3.56$_b$	0.84
Energy Conservation	3.04$_a$	0.84	3.36$_b$	0.87
Household Practices	3.31$_a$	0.93	3.64$_b$	0.77
Environmental Taxes	1.97$_a$	0.95	2.19$_a$	0.93
Environmental Advocacy	2.66$_a$	0.95	3.07$_b$	0.92
Environmental Attitudes	2.57$_a$	0.92	3.00$_b$	0.94

Note. Means in rows with different subscripts are significantly different at *p* < .05.

ingroup change condition perceived more harm likelihood (*M* = 3.33, *SD* = 0.88) than those in the stability condition, (*M* = 2.93, *SD* = 1.00). For collective efficacy, the main effect of ingroup stability and change was not significant, *F*(1, 128) = 2.35, *p* = .13.

Motivations for Reducing Global Warming

Analysis of variance. The effects of ingroup stability and change on collective

emotions were examined using a one-way ANOVA. For collective guilt, the main

effect of ingroup stability and change was significant, $F(1, 128) = 8.52, p < .01$.

Participants in the change condition experienced more collective guilt about

Americans' contributions to greenhouse gas emissions ($M = 4.56, SD = 1.47$) than

those in the stability condition ($M = 3.75, SD = 1.52$). For collective anxiety, the main

effect of ingroup stability and change was significant, $F(1, 128) = 5.12, p < .05$.

Participants in the change condition experienced more collective anxiety about future

ingroup harm ($M = 4.88, SD = 1.36$) than those on the stability condition ($M = 4.26$,

$SD = 1.69$).

Mediation analysis. The effects of perceived ingroup stability and change on

collective guilt were examined first. Participants in the ingroup change condition

experienced more collective guilt than those in the stability condition, $\beta = .53, p <$

.01. However, when the four legitimizations were included as mediators in the

equation, ingroup stability and change was no longer related to collective guilt, $\beta =$

$.16, p = .21$.

Whether legitimizations for present ingroup behavior mediated the effects of

ingroup stability and change on collective guilt was examined next. First, the

mediating role of legitimizations that reaffirm the acceptability of present ingroup

behavior was examined. Collective responsibility was a significant mediator, $CI_{.95} =$

(.02, .26). Participants in the ingroup change condition felt more collective

responsibility for the harm done to future ingroup members by global warming than those in the stability condition, β = .43, p < .05. Participants who felt more collective responsibility experienced more collective guilt, β = .26, p < .01. Legitimacy was also a significant mediator, $CI_{.95}$ = (.04, .34). Participants in the ingroup change condition perceived ingroup greenhouse gas emissions as less legitimate than those in the stability condition, β = -.50, p < .01. Participants who perceived ingroup greenhouse gas emissions as less legitimate experienced more collective guilt, β = .30, p < .001.

Second, the mediating role of legitimizations that portray global warming in a positive manner was examined. Harm likelihood was not a significant mediator, $CI_{.95}$ = (-.16, .01), nor was collective efficacy, $CI_{.95}$ = (-.19, .01).

Vehicle Emissions

Analysis of variance. The effects of ingroup stability and change on willingness to reduce vehicle emissions were examined using a one-way ANOVA. Participants in the ingroup change condition expressed greater willingness to reduce vehicle emissions (M = 3.56, SD = 0.85) than those in the stability condition (M = 3.20, SD = 0.96), $F(1, 128)$ = 4.94, p < .05.

Mediation analysis. The effects of perceived ingroup stability and change on willingness to reduce vehicle emissions were examined first. Participants in the ingroup change condition expressed greater willingness to reduce vehicle emissions than those in the stability condition, β = .37, p < .05. However, when collective guilt and anxiety were included as mediators in the equation, ingroup stability and change was no longer related to willingness to reduce vehicle emissions, β = -.13, p = .44.

Table 4

Standardized Beta Coefficients for Mediations of Collective Emotions on Green Attitudes and Practices

	X→M	M→Y	X→Y$_1$	X→Y$_2$
Vehicle Emissions				
Collective Guilt	.53**	.21	.37*	-.13
Collective Anxiety	.41*	.31**	---	---
Energy Conservation				
Collective Guilt	---	.27*	.37*	-.10
Collective Anxiety	---	.32**	---	---
Green Household Practices				
Collective Guilt	---	.22*	.39*	-.10
Collective Anxiety	---	.42***	---	---
Environmental Advocacy				
Collective Guilt	---	.25**	.43*	-.08
Collective Anxiety	---	.52***	---	---
Environmental Attitudes				
Collective Guilt	---	.27**	.45*	.11
Collective Anxiety	---	.50***	---	---

Note. X→M = harm likelihood on mediator; M→Y = mediator on green attitude or practice; X→Y$_1$ = harm likelihood on green attitude or practice excluding mediators; X→Y$_2$ = harm likelihood on green attitude or practice including mediators.

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

Whether collective guilt and anxiety mediated the effects of ingroup stability and change on willingness to reduce vehicle emissions was examined next. Collective guilt was a significant mediator, $CI_{.95}$ = (.02, .31). Participants in the ingroup change condition experienced more collective guilt for Americans' greenhouse gas emissions than those in the stability condition, β = .53, p < .01. Participants who experienced

more collective guilt did not report greater willingness to reduce vehicle emissions, β = .21, p = .07. Collective anxiety was also a significant mediator, $CI_{.95}$ = (.01, .33). Participants in the ingroup change condition experienced more collective anxiety about future ingroup harm than those in the stability condition, β = .41, $p < .05$. Participants who experienced more collective anxiety expressed greater willingness to reduce vehicle emissions, β = .31, $p < .01$.

Energy Conservation

Analysis of variance. The effects of ingroup stability and change on willingness to conserve energy were examined using a one-way ANOVA. Participants in the ingroup change condition expressed greater willingness to conserve energy (M = 3.36, SD = 0.87) than those in the stability condition (M = 3.04, SD = 0.84), $F(1, 128)$ = 4.17, $p < .05$.

Mediation analysis. The effects of perceived ingroup stability and change on willingness to conserve energy were examined first. Participants in the ingroup change condition expressed greater willingness to conserve energy than those in the stability condition, β = .37, $p < .05$. However, when collective guilt and anxiety were included as mediators in the equation, ingroup stability and change was no longer related to willingness to conserve energy, β = -.10, p = .53.

Whether collective guilt and anxiety mediated the effects of ingroup stability and change on willingness to conserve energy was examined next. Collective guilt was a significant mediator, $CI_{.95}$ = (.03, .36). Participants in the ingroup change condition experienced more collective guilt for Americans' greenhouse gas emissions

than those in the stability condition, $\beta = .53$, $p < .01$. Participants who experienced more collective guilt expressed greater willingness to conserve energy, $\beta = .27$, $p < .05$. Collective anxiety was also a significant mediator, $CI_{.95} = (.02, .35)$. Participants in the ingroup change condition experienced more collective anxiety about future ingroup harm than those in the stability condition, $\beta = .41$, $p < .05$. Participants who experienced more collective anxiety expressed greater willingness to reduce vehicle emissions, $\beta = .32$, $p < .01$.

Green Household Practices

Analysis of variance. The effects of ingroup stability and change on willingness to engage in green household practices were examined using a one-way ANOVA. Participants in the ingroup change condition expressed greater willingness to engage in green household practices ($M = 3.64$, $SD = 0.77$) than those in the stability condition ($M = 3.31$, $SD = 0.93$), $F(1, 127) = 4.49$, $p < .05$.

Mediation analysis. The effects of perceived ingroup stability and change on willingness to engage in green household practices were examined first. Participants in the ingroup change condition expressed greater willingness to engage in green household practices than those in the stability condition, $\beta = .39$, $p < .05$. However, when collective guilt and anxiety were included as mediators in the equation, ingroup stability and change was no longer related to willingness to engage in green household practices, $\beta = -.10$, $p = .51$.

Whether collective guilt and anxiety mediated the effects of ingroup stability and change on willingness to engage in green household practices was examined

next. Collective guilt was a significant mediator, $CI_{.95} = (.02, .30)$. Participants in the ingroup change condition experienced more collective guilt for Americans' greenhouse gas emissions than those in the stability condition, $\beta = .53$, $p < .01$. Participants who experienced more collective guilt expressed greater willingness to engage in green household practices, $\beta = .22$, $p < .05$. Collective anxiety was also a significant mediator, $CI_{.95} = (.03, .41)$. Participants in the ingroup change condition experienced more collective anxiety about future ingroup harm than those in the stability condition, $\beta = .41$, $p < .05$. Participants who experienced more collective anxiety expressed greater willingness to engage in green household practices, $\beta = .42$, $p < .001$.

Environmental Taxes

    Analysis of variance. The effects of ingroup stability and change on willingness to pay environmental taxes were examined using a one-way ANOVA. The main effect of ingroup stability and change was not significant, $F(1, 128) = 1.65$, $p = .20$. Participants in the ingroup change condition ($M = 2.19$, $SD = 0.93$) did not express greater willingness to pay environmental taxes than those in the stability condition ($M = 1.97$, $SD = 0.95$). For this reason, mediation analysis was not conducted for this measure.

Environmental Advocacy

    Analysis of variance. The effects of ingroup stability and change on willingness to engage in environmental advocacy were examined using a one-way ANOVA. Participants in the ingroup change condition expressed greater willingness

to engage in environmental advocacy ($M = 3.07$, $SD = 0.92$) than those in the stability condition ($M = 2.66$, $SD = 0.95$), $F(1, 128) = 5.67$, $p < .05$.

Mediation analysis. The effects of perceived ingroup stability and change on willingness to engage in environmental advocacy were examined first. Participants in the ingroup change condition expressed greater willingness to engage in environmental advocacy than those in the stability condition, $\beta = .43$, $p < .05$. However, when collective guilt and anxiety were included as mediators in the equation, ingroup stability and change was no longer related to willingness to engage in environmental advocacy, $\beta = -.08$, $p = .52$.

Whether collective guilt and anxiety mediated the effects of ingroup stability and change on willingness to engage in environmental advocacy was examined next. Collective guilt was a significant mediator, $CI_{.95} = (.04, .32)$. Participants in the ingroup change condition experienced more collective guilt for Americans' greenhouse gas emissions than those in the stability condition, $\beta = .53$, $p < .01$. Participants who experienced more collective guilt expressed greater willingness to engage in environmental advocacy, $\beta = .25$, $p < .01$. Collective anxiety was also a significant mediator, $CI_{.95} = (.03, .45)$. Participants in the ingroup change condition experienced more collective anxiety about future ingroup harm than those in the stability condition, $\beta = .41$, $p < .05$. Participants who experienced more collective anxiety expressed greater willingness to engage in environmental advocacy, $\beta = .52$, $p < .001$.

Sticker Preference

    Logistic regression analysis. The effects of ingroup stability and change on sticker preference were examined using logistic regression. The main effect of ingroup stability and change was not significant, Wald $\chi^2(1) = 0.01$, $p = .91$. Participants in the ingroup change condition were not more likely to take the sticker advocating global warming reduction ($f = 42.9\%$) than were those in the stability condition ($f = 41.9\%$). Thus, mediation analysis was not conducted for this measure.

Email Preference

    Logistic regression analysis. The effects of ingroup stability and change on email preference were examined using logistic regression. Participants in the ingroup change condition were more likely to sign-up for additional information about global warming ($f = 60.5\%$) than those in the stability condition ($f = 40.9\%$), Wald $\chi^2(1) = 4.40$, $p < .05$.

    Mediation analysis. The effects of perceived ingroup stability and change on email preference were examined first. Participants in the ingroup change condition were 19.0% more likely to sign-up for additional information about global warming than those in the stability condition, Wald $\chi^2(1) = 4.40$, $p < .05$. However, when collective guilt and anxiety were included as mediators in the equation, participants in the ingroup change were only 10.2% more likely to sign-up for additional information about global warming than those in the stability condition, Wald $\chi^2(1) = 1.01$, $p = .32$.

    Whether collective guilt and anxiety mediated the effects of ingroup stability and change on email preference was examined next. Collective guilt was a significant

mediator, $CI_{.95}$ = (-.83, -.04). Participants in the ingroup change condition felt more collective guilt for Americans' greenhouse gas emissions than those in the stability condition, β = .25, p < .01. For each unit change in collective guilt, participants were 11.2% more likely to sign-up for additional information about global warming, Wald $\chi^2(1)$ = 5.56, p < .05. However, collective anxiety was not a significant mediator, $CI_{.95}$ = (-.50, .07).

Environmental Attitudes

Analysis of variance. The effects of ingroup stability and change on pro-environmental attitudes were examined using a one-way ANOVA. Participants in the ingroup change condition expressed stronger pro-environmental attitudes (M = 3.00, SD = 0.94) than those in the stability condition (M = 2.57, SD = 0.92), $F(1, 127)$ = 6.23, p < .05.

Mediation analysis. The effects of perceived ingroup stability and change on pro-environmental attitudes were examined first. Participants in the ingroup change condition expressed stronger pro-environmental attitudes than those in the stability condition, β = .45, p < .05. However, when collective guilt and anxiety were included as mediators in the equation, ingroup stability and change was no longer related to pro-environmental attitudes, β = .11, p = .40.

Whether collective guilt and anxiety mediated the effects of ingroup stability and change on pro-environmental attitudes was then examined. Collective guilt was a significant mediator, $CI_{.95}$ = (.04, .32). Participants in the ingroup change condition experienced more collective guilt for Americans' greenhouse gas emissions than

those in the stability condition, $\beta = .53$, $p < .01$. Participants who experienced more collective guilt expressed stronger pro-environmental attitudes, $\beta = .27$, $p < .01$. Collective anxiety was also a significant mediator, $CI_{.95} = (.03, .43)$. Participants in the ingroup change condition experienced more collective anxiety about future ingroup harm than those in the stability condition, $\beta = .41$, $p < .05$. Participants who experienced more collective anxiety expressed stronger pro-environmental attitudes, $\beta = .50$, $p < .001$.

Discussion

The results of Study 2 provided additional support for the notion that people can experience collective guilt for present-day behaviors that harm future ingroup members. Heightened perceptions of ingroup stability diminished environmental attitudes, willingness to engage in behaviors aimed at lessening global warming, and providing one's email address to receive more information about global warming. When the world for future ingroup members will be largely the same as it is in the present, then there is less need or impetus to foster changes that help reduce global warming. In contrast, when the future ingroup's world will be different than it is in the present, then there is greater need to make changes to reduce global warming.

The relationship between ingroup stability and change on green attitudes and practices was mediated by collective guilt, even when collective anxiety was accounted for. That is, perceiving the present and future as similar reduces collective guilt for contributing to greenhouse gas emissions, even after exposure to scientific evidence connecting such emissions to global warming. These results are consistent

with previous research on collective guilt, which shows that collective guilt motivates attitudes and behavior related to promoting better future outcomes for the ingroup (e.g., repairing the harm done, reconciliation; Wohl, Branscombe, & Klar, 2006). They also provide further support for the value of collective guilt in motivating reductions in global warming.

Nonetheless, it is not clear why collective guilt promoted only the request for more information about global warming, but not the taking of a sticker. One possible explanation is that participants did not believe that displaying a green sticker would be effective in helping to reduce global warming. Displaying a sticker might not make any difference, as others might simply ignore the sticker and continue to contribute to greenhouse gas emissions. However, more information might allow participants to learn about what changes they could make, or encourage others to make, in order to effectively reduce global warming. A second possibility is that publicly accepting and displaying a sticker in support of global warming reduction might not be perceived as socially desirable to other ingroup members, perhaps suggesting that participants held extreme views on the environment. This aversive self-categorization might lead them to opt for more private or easily justifiable behaviors, such as requesting information about global warming (e.g., Goffman, 1959).

Furthermore, it is interesting that collective anxiety served a broader mediating role in Study 2 than in Study 1. This could be due to the decreased psychological distance in time across the studies (20 years in Study 2 vs. 50 years in Study 1), but it could also be due to the different independent variable used in the

mediation analyses (ingroup stability vs. harm likelihood) as well as others factors (e.g., the newer measure of guilt, rising energy prices between the two studies). Even if harm is likely to happen, this might not matter as much if the future impact of the harm is diminished by the perception of future ingroup stability. Although it is not possible to adjudicate between the different explanations for the stronger presence of collective anxiety in Study 2 (nor did this work attempt to do so), the issue of harm severity was examined in more depth in Study 3.

The results of Study 2 also provide some support for the notion that the effects of perceived ingroup stability and change on collective guilt are channeled through the legitimizations closely tied to reaffirming the legitimacy of present-day ingroup behavior (collective responsibility and collective legitimacy), rather than through those closely tied to realistic appraisals of the harm and the group's potential to cope with it (harm likelihood and collective efficacy). That is, perceived ingroup stability reduces collective guilt by increasing the legitimacy of present-day ingroup greenhouse gas emissions, and denying responsibility for the effects of global warming—rather than via the perceived harm likelihood or collective efficacy. If the future is going to be the same as today, then it is okay to produce greenhouse gases and our group is not responsible for global warming. This seems consistent with the view that the global warming debate is mainly a controversy of legitimacy over present-day group action, rather than an attempt to assess the veracity and effects of global warming. However, the stronger mediating role of collective anxiety in Study 2 provides some evidence against this view, as collective anxiety is about preventing

future harm arising from global warming (Molden et al., 2008). Such prevention would apparently arise from realistic appraisals of the impending threat.

One potential issue that arises from Study 2 concerns the nature of the manipulation. It could be that the manipulation is confounded by the content that participants wrote for the manipulation of stability and change. For instance, it could be that in the change condition, participants overwhelmingly wrote about increased environmental awareness in the future, resulting in stronger green attitudes and practices in that condition. Indeed, there is evidence that participants wrote more about greater environmental awareness in the change condition than they did in the stability condition. This issue was mentioned at least 15 times by participants in the change condition, more than any other difference between present and future ingroup members. Nevertheless, this difference in participants' text responses cannot explain why there was no difference between the initial control and change conditions. If the greater attention drawn to increased environmental awareness produced the findings on green attitudes and practices, then one would have expected to see differences between the control and change conditions. There were none. It seems that the key difference is between the ingroup stability condition and the other two conditions.

Study 2 has one important limitation that should be considered. This concerns measurement order. Most of the legitimizations were measured after collective guilt, rather than before it, because of concerns about potential reactivity and suspicion. However, this raises potential interpretive issues, particularly for the mediation of ingroup stability and change on collective guilt via legitimizations. If one wants to

substantiate the causal relationships between ingroup stability, legitimizations, and collective guilt, then it seems appropriate to measure the variables in the order of the predicted sequence of effects. In Study 3, the dependent measures were reordered to remedy this limitation, with one exception. Collective efficacy was still measured after collective guilt based on concerns about reactivity (Schmitt et al., 2008).

Study 3

Study 3 employed an experimental design to examine the effects of perceived global warming impact and cause on legitimizations, collective emotions, and green attitudes and practices. Recall that Study 2 manipulated perceived ingroup stability and change—the degree to which the future ingroup would be perceived as the same as the present-day ingroup. This perception of stability was general; it was grounded in participants' perceptions of similarity between the cultural activities or beliefs of present and future ingroup members. The perception of stability was not specific to the consequences of global warming on future ingroup members; it was not focused on the harmful changes produced by global warming.

Study 3 directly manipulates the degree of ingroup stability by varying the perceived impact that global warming will have on future ingroup members—a minor impact (relative ingroup stability) or a major impact (relative ingroup change). When people downplay the harm from global warming, they are likewise suggesting that the future ingroup will be relatively stable in response to global warming, which reduces adherence to green attitudes and practices. In contrast, when people cannot deny the negative consequences of global warming, they are conceding that the ingroup will

experience change, presumably relative to the degree of impact. Therefore, the manipulation of global warming impact seemingly focuses on more than harm severity—it focuses on ingroup stability and change directly resulting from the consequences of global warming on future ingroup members.

Study 3 also employed a manipulation of global warming cause. Recall that legitimizations that reaffirm the acceptability of ingroup greenhouse gas emissions mediated the effects of perceived harm likelihood on collective guilt in Study 2— collective responsibility and collective legitimacy. If collective responsibility is a legitimization, then reducing responsibility for global warming should reduce the ingroup's sense of *illegitimacy*—thus, undermining members' impetus to adopt attitudes and practices that mitigate global warming (Wohl et al., 2006).

This apparently underlies the controversy surrounding what causes global warming—whether it is caused by human action (e.g., human-produced greenhouse gas emissions) or natural processes (e.g., increased solar activity or recovery from a previous ice age). When nature is perceived to cause global warming, this legitimizes the ingroup's greenhouse gas emissions, undermining the motivation to adopt green attitudes and practices. Conversely, when humans are perceived to cause global warming, this delegitimizes the ingroup's greenhouse gas emissions, promoting the motivation to adopt green attitudes and practices. Accordingly, Study 3 manipulates the cause of global warming, whether it is caused by natural versus human processes.

These two legitimizations—perceived global warming impact and cause— should interact in interesting ways. First, when global warming is perceived to have

only a minor impact on the future ingroup and natural processes cause global

warming, then this provides a particularly high degree of legitimization for present

greenhouse gas emissions. When global warming is a natural process that will not

harm the future ingroup, then there is little impetus to espouse green attitudes and

behaviors. Second, when global warming is perceived to have a major impact on the

future ingroup and human processes cause global warming, then this provides a

particularly low degree of legitimization for present greenhouse gas emissions. When

global warming is a human-caused process that will harm the future ingroup, then

there is greater impetus to espouse green attitudes and behaviors, so as to reduce

global warming.

Three predictions are made for Study 3. First, a global warming cause by

global warming impact interaction is expected on legitimizations, collective

emotions, and green attitudes and behaviors. Legitimizations will be strongest in the

natural cause/minor impact condition, and weakest in the human cause/major impact

condition. In the former case, stronger legitimization (lower harm severity, collective

responsibility, and collective efficacy, as well as higher collective legitimacy),

weaker collective guilt, and weaker green attitudes (higher political conservativism)

and behaviors (willingness to pay environmental taxes) will be elicited, relative to all

other conditions. In the latter case, weaker legitimization, stronger collective guilt,

and stronger attitudes and behaviors supportive of reducing global warming will be

elicited.

Method

Participants and Procedure

Seventy-seven participants (32 men and 45 women) participated in the study on a volunteer basis. All participants indicated that they were American citizens and had not previously completed a questionnaire on global warming. Participants were approached by a research assistant at university eateries and asked if they would consider participating in a public opinion poll on global warming, ostensibly conducted by the university climate research center.

Upon agreeing to participate, the assistant handed the participant a two-page, single-sheet survey from a pile that had been randomized earlier and told them to begin by reading the information at the top of the first page. This information said that scientists have substantial evidence that global warming is real, but much less evidence about the causes of global warming or its effects on future Americans. The university climate research center had purportedly conducted a landmark study to examine these issues, and was now conducting a poll to get public reactions to their findings.

The information that followed manipulated the cause of global warming (human vs. nature) and the severity of harm to the future ingroup (minor vs. major impact)—Americans in the next fifty years (comparable to Study 1). For instance, participants in the minor impact/natural cause condition read that "…the study provided strong evidence that global warming is primarily caused by natural processes, such as increases in solar and volcanic activity; further, the study provided

strong evidence that global warming will have only a minor impact on the United

States in the future, confined mostly to occasional hot days or some localized

flooding" (see Appendix B, p. 109 for complete manipulation text). After reading this

information, participants completed the dependent measures. The manipulation and

dependent measures maintained participants' social identity salience by repeatedly

mentioning "American" throughout the text. After completing the survey, participants

were given a debriefing sheet and thanked for their participation (see Appendix F, p.

117 for the debriefing information)

Dependent Measures

The dependent measures for Study 3 generally represent a sampling of those

used in Study 2. First, participants completed measures of legitimizations—harm

severity, collective responsibility, and collective legitimacy. They first completed a

measure of harm severity. This measure consisted of three questions ($\alpha = .92$), such as

"How much harm do you think global warming will cause to Americans in the

future?" Participants responded on scales ranging from 1 (none at all) to 5 (a whole

lot). They next completed a measure of collective responsibility. This measure

consisted of three questions ($\alpha = .90$), such as "To what extent do you believe that

Americans today are largely responsible for the effects of global warming?" They

then completed a measure of legitimacy. This measure consisted of three questions (α

$= .77$), such as "To what extent do you believe it is wrong that Americans today

contribute to greenhouse gas emissions (by driving automobiles, consuming energy,

and in other ways)?" One legitimacy question (the "not okay" item) was omitted from

subsequent analyses because it significantly reduced the reliability of the composite

measure. Participants responded to these two measures on scales ranging from 1 (not

at all) to 5 (extremely).

Second, participants completed measures of collective emotions. They

completed a measure of collective anxiety. This measure consisted of three questions

($\alpha = .90$), such as "To what extent do you feel nervous about the impact of global

warming on Americans in the future?" They next completed a measure of collective

guilt. This measure consisted of three questions ($\alpha = .89$), such as "To what extent do

you feel guilty that Americans today contribute to greenhouse gas emissions (by

driving automobiles, consuming electricity, and in other ways)?" Participants then

completed a measure of collective efficacy. This measure consisted of three questions

($\alpha = .98$), such as "To what extent do you believe that if Americans today worked

together, then they could reduce the impact of global warming on Americans in the

future?" Participants responded to these three measures on scales ranging from 1 (not

at all) to 5 (extremely).

Third, participants completed measures of green attitudes and practices. They

completed a measure of willingness to pay environmental taxes. This measure

consisted of three questions ($\alpha = .85$), such as "To what extent would you willing to

support a 20¢ per gallon gasoline tax, designed to encourage people to use less

gasoline or obtain a more fuel efficient vehicle?" Participants responded on scales

ranging from 1 (not at all) to 5 (extremely). They then indicated their political

attitudes. This measure consisted of one question, which read "What best captures

your political views?" Participants responded by circling Republican, Democrat, or neither.

Results

Analytic Strategy

Study 3 examines whether collective emotions mediate the effects of global warming cause type on pro-environmental attitudes and behaviors. The potential mediating role of legitimizations on collective guilt was also examined. To examine these issues, analysis of variance was conducted on all measures, including the measure of political attitudes. Despite its constrained variability, the underlying distribution of the political attitudes measure is continuous. This measure was thus coded to reflect the underlying distribution (1 = Democrat, 2 = Neither, 3 = Republican). It is important to point out that analysis of variance is reasonably robust to deviations of normality in dependent measures, even in severe cases (e.g., Myers & Wells, 2003). Afterwards, mediation analyses were conducted using the procedures outlined in Study 1. For these analyses, the manipulation of global warming cause type was coded natural = 0 and human = 1.

As will be seen in subsequent analyses, the human cause/major impact component of the predictions did not reach significance for any of the dependent measures. More commentary on why this occurred will be provided in the discussion. Nonetheless, the natural cause/minor impact component of the predictions did reach significance for most dependent measures. The manipulation of global warming cause type seemed to account for the results of the dependent measures with the minor

impact condition (not vice versa); this is consistent with the suggestions that the global warming controversy is more about legitimization than it is about realistic appraisal. Accordingly, planned comparisons were conducted on significant ANOVA interaction effects to examine the difference between the natural cause/minor impact condition and the other three conditions. Mediation analyses were also conducted using global warming cause as a predictor to examine its effects on dependent measures in the minor impact condition. This approach seemed to be the most sensible way of testing the predicted results given the obtained findings.

In order to simplify the presentation of results for Study 3, two tables have been presented. Table 5 presents the descriptive statistics for green attitude and practice measures, while Table 6 presents standardized beta coefficients for the mediation analyses. In addition, the correlations among legitimizations, collective emotions, and green attitudes and practices can be found in Appendices J-M (pp. 124-127).

Legitimizations for Present Ingroup Behavior

Analysis of variance. The effects of global warming cause and harm severity on legitimizations for present ingroup behavior were examined using a 2 (cause: nature, human) x 2 (severity: minor, major) ANOVA. The legitimizations that attempt to reaffirm the acceptability of ingroup behavior were examined first. For collective responsibility, the main effect of global warming cause was significant, $F(1, 73) = 9.79, p < .01$. Participants in the human cause condition perceived more collective

Table 5

Descriptive Statistics for Legitimizations, Collective Emotions, and Green Attitudes and Practices by Global Warming Cause and Harm Severity

		Minor		Major	
		Nature	Human	Nature	Human
Harm Severity	*M*	2.51	3.87	3.54	3.91
	SD	1.34	0.83	0.94	0.97
Collective Responsibility	*M*	2.94	3.78	3.38	3.95
	SD	1.40	0.67	0.98	0.76
Collective Legitimacy	M	3.38	2.50	3.24	2.55
	SD	1.05	0.94	1.33	0.98
Collective Efficacy	*M*	3.49	4.06	3.86	3.98
	SD	1.59	1.18	1.21	1.15
Collective Guilt	*M*	2.35	3.65	2.87	3.09
	SD	1.08	0.84	1.12	1.01
Collective Anxiety	*M*	2.43	3.65	3.32	3.51
	SD	1.33	0.78	1.20	1.10
Environmental Taxes	*M*	2.00	2.93	2.17	2.65
	SD	1.18	1.10	1.26	1.15
Political Conservativism	*M*	2.12	1.44	1.61	1.64
	SD	0.78	0.62	0.72	0.75

responsibility for global warming (*M* = 3.87, *SD* = 1.18) than those in the natural cause condition (*M* = 3.19, *SD* = 0.71). This supports the validity of the global warming cause manipulation, as natural causes would presumably entail lower human

responsibility. For legitimacy, the main effect of global warming cause was significant, $F(1, 73) = 9.58$, $p < .01$. Participants in the human cause condition perceived that ingroup greenhouse gas emissions were less legitimate ($M = 2.53$, $SD = 0.95$) than those in the natural cause condition ($M = 3.30$, $SD = 1.21$).

Second, the legitimizations that involve portraying global warming in a positive manner were examined. For harm severity, the main effect of impact condition was significant, $F(1, 73) = 5.17$, $p < .05$. Participants in the major impact condition perceived more harm severity ($M = 3.71$, $SD = 0.96$) than those in the minor impact condition ($M = 3.21$, $SD = 1.29$), ($M = 2.93$, $SD = 1.00$). This supports the validity of the manipulation of harm severity. The main effect of global warming cause was also significant, $F(1, 73) = 13.65$, $p < .001$. Participants in the human cause condition reported that global warming would be more harmful ($M = 3.89$, $SD = 0.89$) than those in the natural cause condition ($M = 3.10$, $SD = 1.22$). These main effects were qualified by a global warming cause by impact condition interaction, $F(1, 73) = 4.39$, $p < .05$. Participants in the minor impact/natural cause condition reported that global warming would be less harmful ($M = 2.51$, $SD = 1.34$) than those in the other conditions ($M = 3.76$, $SD = 0.92$), $t(73) = -4.48$, $p < .001$. For collective efficacy, no effects were obtained.

Motivations for Reducing Global Warming

Analysis of variance. The effects of global warming cause and harm severity on collective emotions were examined using a 2 (cause: nature, human) x 2 (severity: minor, major) ANOVA. For collective guilt, the main effect of global warming cause

was significant, $F(1, 73) = 10.38$, $p < .01$. Participants in the human cause condition ($M = 3.36$, $SD = 0.96$) reported more collective guilt for Americans' greenhouse gas emissions than those in the natural cause condition ($M = 2.65$, $SD = 1.12$). This main effect was qualified by a global warming cause by harm severity interaction, $F(1, 73) = 5.26$, $p < .05$. Participants in the minor impact/natural cause condition reported less collective guilt ($M = 2.35$, $SD = 1.08$) than those in the other conditions ($M = 2.51$, $SD = 1.34$), $t(73) = -3.01$, $p < .01$.

For collective anxiety, the main effect of global warming cause was significant, $F(1, 73) = 7.46$, $p < .01$. Participants in the human cause condition ($M = 3.58$, $SD = 0.95$) reported more collective anxiety for the harm done to future ingroup members than those in the natural cause condition ($M = 2.94$, $SD = 1.32$). This main effect was qualified by a global warming cause by harm severity interaction, $F(1, 73) = 3.97$, $p < .05$. Participants in the minor impact/natural cause condition reported less collective anxiety about harm to the future ingroup ($M = 2.00$, $SD = 1.18$) than those in the other conditions ($M = 2.55$, $SD = 1.20$), $t(73) = -3.43$, $p < .01$.

Mediation analysis. The effects of global warming cause on collective guilt were examined first. Participants in the human cause condition experienced more collective guilt for Americans' greenhouse gas emissions than those in the natural cause condition, $\beta = .60$, $p < .001$. However, when the legitimizations were included as mediators in the equation, global warming cause was no longer related to collective guilt, $\beta = .23$, $p = .07$.

Whether legitimizations for present ingroup behavior mediated the effects of global warming cause on collective guilt within the minor impact condition was then examined. First, the mediating role of legitimizations that reaffirm the acceptability of present ingroup behavior was examined. Collective responsibility was not a significant mediator, $CI_{.95} = (-.05, .17)$. However, legitimacy was a significant mediator, $CI_{.95} = (.05, .36)$. Participants in the human cause condition perceived ingroup greenhouse gas emissions as less legitimate than those in the natural cause condition, $\beta = -.39$, $p < .05$. Participants who perceived ingroup greenhouse gas emissions as less legitimate experienced more collective guilt, $\beta = .39$, $p < .01$.

Second, the mediating role of legitimizations that reappraise global warming in a positive manner was examined. Harm severity was not a significant mediator, $CI_{.95} = (-.04, .40)$, nor was collective efficacy, $CI_{.95} = (-.03, .23)$.

Environmental Taxes

Analysis of variance. The effects of global warming cause and harm severity on willingness to pay environmental taxes were examined using a 2 (cause: nature, human) x 2 (severity: minor, major) ANOVA. The main effect of global warming cause was significant, $F(1, 73) = 6.69$, $p < .05$. Participants in the human cause condition expressed greater willingness to pay environmental taxes ($M = 2.78$, $SD = 1.12$) than those in the natural cause condition ($M = 2.10$, $SD = 1.22$).

Mediation analysis. The effects of global warming cause on willingness to pay environmental taxes were examined first. Participants in the human cause condition expressed more willingness to pay environmental taxes than those in the natural cause

Table 6

Standardized Beta Coefficients for Mediations of Collective Emotions on Green Attitudes and Practices

	$X \rightarrow M$	$M \rightarrow Y$	$X \rightarrow Y_1$	$X \rightarrow Y_2$
Environmental Taxes				
Collective Guilt	.60***	.52*	.39*	.05
Collective Anxiety	.52**	.05	---	---
Political Conservativism				
Collective Guilt	---	.43	.46**	.14
Collective Anxiety	---	.12	---	---

Note. $X \rightarrow M$ = harm likelihood on mediator; $M \rightarrow Y$ = mediator on green practice; $X \rightarrow Y_1$ = harm likelihood on green practice excluding mediators; $X \rightarrow Y_2$ = harm likelihood on green practice including mediators.

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

condition, β = .39, p < .05. However, when collective guilt and anxiety were included as mediators in the equation, global warming cause was no longer related to willingness to pay environmental taxes, β = .05, p = .80.

Whether collective guilt and anxiety mediated the effects of global warming cause on willingness to pay environmental taxes within the minor impact condition was examined next. Collective guilt was a significant mediator, $CI_{.95}$ = (.09, .64). Participants in the human cause condition experienced more collective guilt for Americans' greenhouse gas emissions than those in the natural cause condition, β = .60, p < .001. Participants who experienced more collective guilt expressed greater

willingness to pay environmental taxes, β = .52, p < .05. However, collective anxiety

was not a significant mediator, $CI_{.95}$ = (-.27, .34).

Political Attitudes

 Analysis of variance. The effects of global warming cause and harm severity

on political attitudes were examined using a 2 (cause: nature, human) x 2 (severity:

minor, major) ANOVA. A global warming cause by harm severity interaction was

obtained, $F(1, 73)$ = 5.14, p < .05. Participants in the minor impact/natural cause

condition reported stronger conservative attitudes (M = 2.42, SD = 0.70) than those in

the other conditions (M = 1.88, SD = 0.78), $t(73)$ = -2.72, p < .01.

 Mediation analysis. The effects of global warming cause on political attitudes

were examined first. Participants in the natural cause condition expressed stronger

conservative attitudes than those in the human cause condition, β = .46, p < .01.

However, when collective guilt and anxiety were included as mediators in the

equation, global warming cause was no longer related to political attitudes, β = .14, p

= .44.

 Whether collective guilt and anxiety mediated the effects of global warming

cause on political attitudes within the minor impact condition was examined next.

Collective guilt was a significant mediator, $CI_{.95}$ = (.03, .64). Participants in the

human cause condition experienced more collective guilt for Americans' greenhouse

gas emissions than those in the natural cause condition, β = .60, p < .001. Participants

who experienced more collective guilt did not express stronger liberal attitudes, β =

.43, p = .06. However, collective anxiety was not a significant mediator, $CI_{.95}$ = (-.09,

.44).

Discussion

The results of Study 3 provide further evidence in support of the notion that

people can experience collective guilt for present-day behavior that harms future

ingroup members. The minor impact/natural cause condition generally produced a

stronger degree of legitimization for present-day ingroup behavior, which led to the

lowest levels of collective guilt, willingness to pay environmental taxes, and political

liberalism relative to the other conditions.

Relative to the minor impact/natural cause condition, the major impact/human

cause condition did not produce a weaker degree of legitimization for present-day

ingroup behavior. Nor did this condition elicit higher levels of collective guilt,

willingness to pay environmental taxes, and political liberalism. One possibility is

that it is easier to reduce collective guilt than it is to increase collective guilt—thus,

the predicted effects were found in the minor impact/natural cause condition, but not

the major impact/human cause condition. Another possibility is that responsibility for

the harm done to future ingroup members will matter most in conditions of minimal

harm. It is plausible that in conditions of maximal harm, eliminating negative impacts

becomes the overriding concern. This is consistent with research on risk perception

demonstrating that high impact threats are related to lower perceived controllability,

rendering responsibility less relevant to resulting feelings, thoughts, and behaviors

(Breakwell, 2008; Reicher, Podpadex, Macnaghton, Brown, & Eiser, 1993). A final

possibility is that the human cause/major impact survey was less believable than the surveys in the other conditions, thus not eliciting increased collective guilt.

The latter possibility can be taken a step further to understand the mediation analyses in earlier studies. Given that the mediation analyses in Study 3 worked only within the minor impact condition, and the mediation analyses worked in previous studies without directly manipulating impact, then it stands to reason that the results obtained from Studies 1 and 2 reflected people's general expectation that global warming will produce only a minor impact in the future. When major impact was manipulated, the predicted effects on collective emotions, as well as green attitudes and practices, are no longer reliable. Of course, one should view this interpretation carefully, as the key predictor variables across the three studies differ in meaningful ways. Nonetheless, all three studies share a key commonality—their predictors generally focus on future ingroup stability and change, despite using different operationalizations.

The results of Study 3 also showed that collective anxiety represented a much weaker mediator than in Study 2. It is difficult to know why collective anxiety did not have a broader mediating role. There are at least two possibilities. One is that collective anxiety is not as relevant in the minor impact condition. That is, when the harm is not as imposing, then people do not feel compelled to prevent the harm that might occur. Another possibility is that psychological distance in time (50 years in Study 1 and 3 versus 20 years in Study 2) lowered the relevance of collective anxiety

for adopting pro-environmental attitudes and behaviors. In this case, only collective guilt would be useful in promoting the reduction of global warming.

Additionally, only legitimacy mediated the effects of global warming cause on collective guilt within the minor impact condition. This provides some support for the notion that the global warming controversy is primarily about legitimization of the present ingroup's behavior than it is about appraisals of the realistic threat posed by global warming. Nevertheless, it remains possible that the immediacy of the threat affects the tendency to generate realistic appraisals of the threat versus legitimize present ingroup behavior.

The results of Study 3 must be interpreted in the context of its key limitations. One limitation is measurement order. Although Study 3 is improved in this manner over Study 2, collective efficacy was still measured after collective guilt because of concerns about suspicion—that directly asking about whether Americans could do something about global warming would suggest that our study focused on this topic, thereby eliciting questionable effects on subsequent measures. Another limitation is that the dependent measures are comprised of a relatively small number of items, as low as one item in the case of political attitudes. Single item scales can be unreliable, unless they are straightforward (e.g., Robins, Hendlin, & Trzesniewski, 2001). Other scales had three items, so as to pragmatically fit the manipulations and measures on a single sheet of paper. Nonetheless, such limitations should presumably work against the predicted effects, which were still obtained on most dependent measures.

General Discussion

The results of these three studies support the notion that people can experience collective guilt for present-day behavior that will harm future ingroup members. The results of Study 1 show that collective guilt mediates the relationship between the likelihood of harm to future ingroup members and willingness to engage in five types of behaviors aimed at reducing global warming. Collective guilt also mediates the relationship between harm likelihood on pro-environmental attitudes. Collective anxiety only mediates the relationship between harm likelihood and willingness to engage in one behavior, environmental advocacy.

The results of Study 2 show that increases in perceived ingroup stability can diminish the need and impetus for reducing global warming. First, it can increase legitimization by reducing the perceived likelihood of harm from global warming and collective responsibility for global warming, as well as increasing legitimacy. Second, this increase in legitimization is reflected in a decrease in collective emotions, both collective guilt and collective anxiety. This increased legitimization is also reflected in a decrease in willingness to engage in four-of-the-five types of behaviors aimed at reducing global warming (excluding paying environmental taxes), as well as a lower frequency of providing one's email address in order to receive further information about global warming. Increased legitimization is also reflected in weaker pro-environmental attitudes.

The results of Study 2 also show that collective guilt and collective anxiety mediated the effects on green attitudes and practices. Increased ingroup stability led

to diminished willingness to engage in green attitudes and practices via diminished collective emotions. Moreover, legitimizations related to affirming the acceptability of present-day ingroup behavior mediated the relationship between perceived harm likelihood and collective guilt. Legitimizations related to assessing the realistic threat posed by global warming failed to mediate this relationship.

The results of Study 3 show that the legitimization provided by perceiving the impact of global warming as minor and stemming from natural causes diminished the motivation to reduce global warming. This enhanced degree of legitimization led to reduced collective guilt and collective anxiety, as well as reduced willingness to pay environmental taxes, relative to all other conditions. It also led to increased political conservativism. Furthermore, when the impact of global warming is perceived as minor, collective guilt mediated the relationship between global warming cause and green attitudes and practices.

Taken together, the results of these three studies lend support to two general conclusions. First, people can experience collective guilt for present-day behavior that harms future ingroup members. Such guilt was found in response to the perceived likelihood that harm would occur, as well as to the perceived severity of harm that would occur. This suggests that perceived harm can play a role in the legitimization of present-day ingroup behaviors that contribute to global warming. As in previous research on collective guilt, downplaying the harm from global warming can lower guilt and willingness to engage in behaviors to remedy ingroup harm-doing.

Second, legitimizations closely tied to reaffirming the acceptability of present-day ingroup behavior channel the effects of perceived harm on collective guilt. This suggests that the controversy over global warming is primarily about the legitimacy of present-day ingroup behavior, rather than determining whether global warming is a genuine threat to future ingroup members. It further calls into question whether there is a firm distinction between realistic and symbolic threats to social identity (Stephan & Stephan, 2000). Perception is responsive to reality, but socially-mediated (Turner, 1991). Accordingly, what seems like realistic perception might derive more from the prevailing consensus than from the bona fide features of reality.

Third, collective guilt represents a valuable motivation in efforts to reduce global warming. In all three of the studies, collective guilt mediated the relationship between perceived harm and green attitudes and practices. These effects held even once collective anxiety, another plausible motivation for reducing global warming, had been accounted for. In general, the results do not support a negative state affect interpretation. If the collective emotion measures captured only a negative affective state, then collective anxiety and collective guilt should have yielded similar results across studies. They did not. Differential emotion, rather than undifferentiated affect, better accounts for the findings across studies. Thus, the present research suggests that collective emotions, such as collective guilt, play a unique role in supporting green attitudes and practices—above and beyond negative affective states.

The results of these studies do suggest a more nuanced picture of the role that collective emotions play in motivating pro-environmental behavior. For instance, in

Study 2, collective guilt motivated the request for further information about global warming, but collective anxiety did not. And neither collective emotion motivated willingness to pay environmental taxes or accepting a sticker that promotes global warming reduction. One possible explanation for these findings is that participants thought that paying taxes and displaying a sticker would be ineffective at reducing global warming. If so, then collective emotions should have less to do with these behaviors than with other, more effective behaviors.

Even so, this does not explain why the request for more information about global warming was associated with collective guilt, but not collective anxiety. It seems plausible that the act of requesting more information about global warming psychologically replaces substantive behavior to reduce global warming—thereby discharging any collective guilt participants might have experienced. This appears consistent with research showing that being better informed about global warming can paradoxically reduce feelings of responsibility (Kellstedt, Zahran, & Vedlitz, 2008). Generally speaking, the act of learning can diminish the impetus for doing, perhaps because it leads people to feel that they have already acted to reduce the negative effects of global warming, when they have not (Moser & Dilling, 2007).

The mediating role of collective guilt in Study 3 was limited to perceptions of minor impact, rather than also extending to major impact. One way to explain this finding is by suggesting that collective guilt is easier to decrease than it is to increase. Providing people with legitimizations (e.g., global warming will only lead to minor harm in the future, it is caused by natural processes) might lower collective guilt, but

actually increasing guilt requires undermining the numerous ways that people have for justifying their present-day ingroup behavior (Wohl et al., 2006).

Another way to explain this finding is that responsibility might play a lesser role when ingroups are faced with certain major harm. For instance, risk perception research has shown that events perceived as catastrophically harmful are also less likely to be seen as controllable (Breakwell, 2008; Slovic, 2000). Some researchers have suggested that controllability is important for the experience of guilt (Roseman, 2004; Tracy & Robins, 2007b; Weiner, 2006). Although human-caused events might be perceived as having catastrophic consequences (Reicher et al., 1993), they might concomitantly reduce the weight of responsibility for tackling those consequences. This is consistent with the notion that realistic appraisals of harm events might be more important when ingroup members have prior expectations that harm might actually occur (Turner, 1991).

<div align="center">Implications of Results for Existing Research</div>

Social Identity

The phenomenon of collective emotions is premised on the salience of social identity and its consequences for appraising emotion-relevant events. This research has suggested that collective emotions can motivate change in present-day behavior that contributes to global warming. This is consistent with research on environmental identity, which shows that when individuals self-categorize as part of nature (rather than as separate from it), they express more willingness to engage in green practices (Clayton & Opotow, 2003). Self-categorization as a part of a group that supports

global warming reduction could be useful in advancing positive environmental outcomes.

In addition, this research has suggested that perceptions of future events can serve to legitimize present-day ingroup actions, as well as alternative actions in the future. This is consistent with research on social identity and collective action (see Sturmer & Simon, 2004 for a review). For instance, Sturmer, Simon, Loewy, and Jorger (2003) found that the relationship between identification with an organized social movement and willingness to participate in movement activities was fully mediated by a sense of inner obligation. This inner obligation derives from ingroup norms, which legitimize or delegitimize particular ingroup behaviors. Feeling such an obligation suggests that participation in the group's activities is considered legitimate, whereas other activities are considered illegitimate. However, perceptions of future events, such as considering that movement activities would be ineffective, could delegitimize engagement in them—thus, eliminating the inner obligation.

Although a question remains about whether the inner obligation in Sturmer et al. (2003) reflected legitimate group activities or *other* illegitimate activities, it seems plausible that collective emotions played an important role. For instance, it could be that participants felt collective pride in response to their anticipated engagement in the group's legitimate activities (e.g., "I'll feel proud to be at the protest"). However, it could also be that participants felt collective guilt for recalling their part in another group's activities in the past, which go against the present group's efforts (e.g., "We shouldn't have done that back then, but going to this protest can assuage this guilt").

In either case, it seems that collective emotions grounded in perceived future events plays a key role in the willingness to engage in collective action. This is consistent with the present results, which show that collective emotion mediates the effects of legitimization on willingness to engage in environmental advocacy.

Collective Emotions

The present research has implications for research on collective emotions. It has been suggested that such research generally examines a limited range of emotion-related events—events that are temporally removed from and relatively uncommon among present-day ingroup members. This emphasis stems from attempts to demonstrate discrepancies between personal and collective emotions via the implausibility of experiencing relevant personal emotions. This is unnecessary, even inconsistent with self-categorization theory and its focus on transformations in the meaning of behavior. Accordingly, by emphasizing the transformation of meaning over the impossibility of experiencing personal emotions, research on collective emotions can examine a broader range of emotionally-relevant events.

The present research also has implications for research on collective guilt. One implication is that people can feel collective guilt for harms that will occur in the future, as well as harms that occurred in the past. Similar to research focusing on past harms, research focusing on future harms suggests that social identity makes harm to future group members relevant to the present ingroup (Wohl et al., 2006). Likewise, as with research on past harms, research on future harms suggests that legitimization plays an important role in mitigating collective guilt. The importance of denial and

justification in the resolution of negative states has a long history in psychology (Allport, 1954; Crandall & Eshleman, 2003; Festinger, 1957; Freud, 1937; Tarvis & Aronson, 2007; Wicklund & Brehm, 1976). This is no less true with collective guilt. It is plausible that denying the existence of global warming in the face of definitive evidence to the contrary has similar psychological underpinnings to denying an ingroup's role in historical tragedies—the Jewish Holocaust, the Native-American Holocaust, the Armenian genocide, and numerous others.

Another implication that the present research has for existing research on collective guilt is to question the assumption that harm-doing results from intentional behavior. In existing research, collective guilt stems from harm that ingroups inflict on outgroups (e.g., colonization, genocide), which seemingly stem from intentional behavior. In contrast, the present research focuses on a harm that ingroups inflict on themselves, which did not require intentionality. It is possible that even the most well-meaning ingroup members will misjudge how their actions will affect future events. The potential for unintentional consequences to generate collective guilt seem particularly poignant when harm occurs in the future—but, this does not exclude the possibility that ingroup-outgroup distinctions might not *only* reflect intentional harm-related behavior.

Reducing Global Warming

The present research has implications for psychological research on reducing global warming. One implication is for research on the role of information in helping to promote pro-environmental behavior. Increased knowledge about global warming

has been found to predict pro-environmental behavior (Gifford, 2007). Nonetheless, many researchers have suggested that increased knowledge might actually diminish pro-environmental actions (e.g., Kellstedt et al., 2008; Moser & Dilling, 2007). For instance, many airlines offer passengers the opportunity to purchase carbon credits to help offset global warming. It is possible that carbon credits and other "low cost" behaviors do little to offset global warming, but rather help to discharge passengers' collective guilt for greenhouse gas emissions stemming from air travel. Indeed, it is interesting that advocates of environmental education also advocate for cultivating feelings of responsibility (Gifford, 2007).

Another implication of the present research is for models that examine the attitude-behavior consistency in social and environmental psychology (see Azjen & Fishbein, 2005; Gifford, 2007; Oskamp & Schultz, 2005 for noteworthy reviews). Researchers have long known that people with stronger pro-environmental attitudes do not necessarily perform more pro-environmental behaviors than do other people. Indeed, correlations between attitudes and behaviors vary across studies, with the lowest correlations coming from studies with measures of real behaviors (Gifford, 2007). Models of attitude-behavior consistency provide explanations for the gaps between related attitudes and behaviors.

Two attitude-behavior consistency models are particularly prominent in explaining pro-environmental behavior—the Theory of Planned Behavior (TPB; Ajzen & Fishbein, 2005) and the Value-Belief-Norm Model (VBN; Stern, 2000). TPB suggests that positive evaluations of, perceived social pressures to engage in,

and perceived ability to perform pro-environmental behaviors elicits intentions to engage in such behavior. Such intentions then elicit pro-environmental behaviors. VBN suggests that pro-environmental values lead to the belief that certain actions produce adverse environmental consequences, and that people will act to mitigate such consequences to the extent that they feel both responsible and able to do so. These two models are similar in that they emphasize how relevant attitudes and values can elicit pro-environmental behavior, when people perceive that they are sufficiently efficacious.

The present research is both similar to and different from TPB and VBN. As for similarities, the present research is also concerned with how affect, social norms, and efficacy influence pro-environmental behavior. As for differences, three warrant mention. The first difference is that the present research distinguishes between undifferentiated attitudes and differentiated emotions. The present research shows that collective guilt mediated the relationship between perceived harm and pro-environmental behavior, not collective anxiety—even though the valence of both emotions is negative. The difference between the emotions is not affective valence, but the meaning that such emotions have for ingroup members. Accordingly, TPB and VBN models might be improved by examining differential emotions, rather than undifferentiated affect.

The second difference is that the present research examines a different causal sequence derived from research on collective guilt. It suggests that self-categorization as a group member provides the contextual frame for affective responses (Kahneman

& Tversky, 2000; Turner et al., 1994), that social norms stem from the salient group membership, and that inconsistency with social norms (i.e., illegitimacy) can provoke collective guilt. This sequence differs from TPB and VBN in that norms/values and affect are seen as the outcome of a dynamic process of self-categorization, rather than as preexisting causes for pro-environmental behavior. Therefore, shifting one's self-categorization in a particular situation should elicit different norms/values, as well as different behaviors. The apparent indifference of TPB and VBN to understanding the cause of attitudes is a limitation only insofar as their empirical instantiations do not elicit a variety of self-categorizations across participants. This would presumably undermine the predicted attitude-behavior relationship in any given application.

The third difference is that the present research explains efficacy differently than TPB and VBN. In these models, efficacy seems to reflect the real world barriers that exist between wanting to and performing pro-environmental acts. However, the present research suggests that the perception of such barriers is socially-mediated (Turner, 1991). This means that what counts as evidence for efficacy will stem from ingroup norms, rather than solely from realistic assessments of the individual's own capability in the situation. Furthermore, since the perception of efficacy is socially-mediated, it is likely to lend justification to social practices that define the ingroup. There at least two ways that efficacy serves a legitimization function—by increasing justification for the existing social practices (such as suggesting that there are no real alternatives to fossil fuel engines) or by decreasing justification for alternative social practices (such as suggesting that steps to reduce global warming are futile because

China and India are not also trying to reduce it). However efficacy is conceptualized, it can provide justification for or against social practices that reduce global warming, irrespective of the reality of people's capacity for making a difference.

Limitations of the Present Research

The present research has two important limitations that should be addressed. The first limitation involves the passage about global warming presented in Study 2. This passage differed from similar passages in other studies in that future Americans were defined as twenty years in the future, rather than fifty years in the future. This could explain why the mediational role of collective anxiety on green attitudes and practices was stronger in Study 2 than it was in the other studies. Nevertheless, it is also possible that different predictor variables, dependent measures, and real world events (record spikes in energy prices) played a notable role. Thus, the findings for collective anxiety must be interpreted with caution. This seems less troublesome in the case of collective guilt, as its central findings replicate across the studies.

Nonetheless, it is important to not overstate the role of temporal distance in examining collective emotions for future harm. For instance, one might think that lowering temporal distance blurs the line between the present and future ingroup, thereby eliciting personal rather than collective emotions. As mentioned earlier, temporal distance does not adjudicate between personal and collective emotions; likewise, temporal distance does not adjudicate between present-day and future ingroups. It is no more appropriate to assume group continuity across time than to assume discontinuity. Social groups continually change as existing members leave or

simply grow older, and as new members join the ranks. What binds social groups together is a shared social identity and its implications for group members.

The second limitation involves the generalizability of the results. Participants in this research are college students. Sears (1986) has suggested that college students are distinct in important ways from other populations—students are more compliant, readily change their attitudes, and often behave inconsistent with them. Furthermore, college students are probably also less likely to own energy-consuming houses, drive vehicles that emit substantial levels of greenhouse gases, or have children to shuffle from location to location, than are other populations. Given that college students are distinct in these ways, it is plausible that collective emotions would be less likely to motivate attitude and behavior change in other populations, those that may contribute more to global warming. Although generalizability is beyond the theoretical purpose of the present research—to examine collective guilt for future harm—this issue has noteworthy practical consequences.

<center>*Future Directions for Collective Guilt Research*</center>

Social Identity

Future research on collective guilt for future harm should more closely examine the role of social identity salience. There are two ways to approach this task. The first would be to examine the role of group identification. According to self-categorization theory, those who are more highly-identified with a particular social group will be more likely to self-categorize as members of the group. This suggests that highly-identified group members should be more likely to experience collective

guilt. Nonetheless, this prediction does not necessarily hold. Ingroup members have access to a wide variety of strategies for legitimizing their group's behavior. This is likely to be particularly true for the social practices that are central to everyday life as an ingroup member. Accordingly, future research on collective guilt for future harm should examine the role of group identification in generating such guilt with this issue in mind. It is possible that this role will be different for ingroup harm than it is for the instances of outgroup harm examined in previous research (Branscombe, 2004).

The second way to approach this task is to manipulate personal versus social identity salience. In the present studies, social identity salience was maintained by mentioning "American" throughout the text. However, it would be interesting to see whether collective guilt responses would be as strong when personal identity was salient, rather than social identity. It is likely that collective guilt would differ for many reasons. One reason is that collective emotions are premised on a salient social identity; shifting the relative balance of salience to personal identity should diminish the potential for collective guilt. Another reason is that a salient personal identity should make personal identity concerns more salient than social identity concerns, thereby diminishing the relevance of harms to future group members. This should diminish collective guilt. Any examination of personal and social identity must be mindful of the possibility that personal and social identity might interact in many important ways (Postmes & Jetten, 2006; Reynolds & Turner, 2006).

Future research on collective guilt for future harm should also more closely examine the role of intragroup dynamics. As mentioned earlier, it is plausible that

people could experience collective guilt for harm that ingroup members are likely to inflict in the future. This possibility is particularly likely because social norms shift across time—in order to justify changing social practices (e.g., Crandall, Eshleman, & O'Brien, 2002; Diekman & Eagly, 2000; Newcomb, 1957). From the perspective of present-day social norms, future ingroup actions might seem quite harmful. Imagine how colonial Americans would evaluate present-day beliefs about religion or social equality. A similar situation might occur for some present-day Americans if future Americans were to overwhelmingly support a constitutional amendment legalizing gay marriage. It is possible that linking present and future Americans via a shared social identity could elicit collective guilt for the harms that future group members will perpetuate, as the groups are likely hold different standards for legitimization.

Furthermore, it seems plausible that future ingroup members might assign collective guilt to present-day ingroup members for behaviors that harm the future. For instance, future Americans might assign collective guilt to present Americans for the negative consequences of global warming. It would be interesting to see whether the salience of this possibility would elicit collective guilt or change motivation for engaging in green practices. These considerations are consistent with research on intergenerational justice, which examines conflicts of interests between different ingroup generations (Barry, 1999; Wade-Benzoni, Hernandez, Medvec, & Messick, 2008). These considerations are also consistent with research on collective guilt assignment, which addresses how harm-doers respond to calls for responsibility from

their victims (Wohl & Branscombe, 2005). Such calls would seem more convincing when coming from other ingroup members (Turner, 1991).

Future research on collective guilt for future harm should also more closely examine the role of intergroup dynamics. There are two ways to address this issue. One way is to focus on the cause of global warming and its harmful consequences. For instance, ingroup members might hold a higher standard for evidence that proves global warming is actually occurring or poses an important risk, when focusing on ingroup greenhouse gas emissions than when focusing on outgroup emissions. Consequently, the higher standard mitigates collective guilt. This view is consistent with research on shifting standards of justice, which shows that ingroups require greater evidence to confirm ingroup injustice when the victimized group is seen as an outgroup than when they are seen as an ingroup (Miron & Branscombe, 2008; Miron, Branscombe, & Biernat, 2008). The standards for deciding whether global warming exists and poses a real threat are within-group standards that shift with salience of group interests (Turner, 1991).

Additionally, ingroup members might be more likely to see greenhouse gas emissions as illegitimate when focusing on an outgroup's emissions than when focusing on the ingroup's emissions. When focusing on an outgroup's emissions, ingroup members might denounce the behavior of the outgroup, but feel reduced collective guilt for ingroup greenhouse gas emissions. However, when focusing on ingroup emissions, members might diffuse ingroup responsibility by suggesting that ingroup members cannot reduce global warming without the help of the outgroup,

thus undermining collective guilt for ingroup inaction. But, ingroup members might feel more collective guilt if the outgroup was taking effective steps to reduce global warming, whereas the ingroup was not. Therefore, an outgroup might be a useful tool in dispelling collective guilt—via legitimizing present ingroup practices—unless the outgroup behaved otherwise.

The second way to examine the role of intergroup dynamics would be to focus on the harmful consequences of global warming. For instance, ingroup greenhouse gas emissions might be seen as more legitimate when global warming is likely to harm an outgroup in the future than when it is likely to harm the ingroup. This might be true for Americans who believed that global warming would harm only distant islanders, such as Indonesians. This would reduce collective guilt. However, if they believed that global warming was likely to harm Hawaiians, then ingroup emissions might be seen as less legitimate and thereby elicit collective guilt. Additionally, if Americans categorized Indonesians within a superordinate human category, then they might also see their greenhouse emissions as illegitimate and feel collective guilt.

Furthermore, the perceived efficacy of strategies to reduce global warming might depend on who is likely to be harmed by global warming in the future. For instance, if the outgroup is likely to be harmed by global warming, then everyday strategies to reduce global warming might be perceived as less effective at reducing global warming than if the ingroup is likely to be harmed by global warming. So long as ingroup interests are protected from global warming, then there is little reason for

changing present-day behavior related to greenhouse gas emissions. However, when ingroup interests are shaken by global warming, then there is more need for change.

Collective Emotion

Several suggestions have been made about collective emotions that warrant further examination. One suggestion is that emotions other than collective guilt might play a role in motivating reductions in global warming. This research examined collective anxiety, but not in depth. Other emotions might also play a role, including collective pride (Tracy & Robins, 2007a) or collective resentment (Iyer, Schamder, & Lickel, 2007). Another suggestion is that collective guilt and collective anxiety are promotion- and prevention-focused emotions, respectively. The role of regulatory-focus in collective emotions is consistent with research addressing the regulatory implications of collective emotions (Maitner et al., 2007; Smith & Mackie, 2008).

Furthermore, future research might examine the role of temporal distance in the experience of collective emotions. According to construal level theory (Liberman et al., 2007), temporally distant events should be represented in an abstract manner, whereas temporally close events should be represented in a detailed manner. It could be that reducing the temporal distance of the harm done by global warming increases the detail that people use in understanding the harm. Thus, when global warming will harm the ingroup in 20 years, people graphically portray the damage and suffering of other ingroup members. However, when global warming will harm the ingroup in 50 years, people have only a vague idea about the harm that global warming will cause. Different representations of the harm done by global warming could have important

implications for collective emotions, such as which emotions are more prominent in motivating pro-environmental behavior. For instance, collective anxiety might elicit more pro-environmental behavior when the harm from global warming is coming in the near future, rather than when it is far off in the distant future. Future research is well-advised to consider this possibility.

Another important avenue for collective emotions research would be to create a coherent account of collective emotion regulation. Although research on personal emotion regulation is well-developed (Gross, 2007), research on collective emotion regulation has a rather piecemeal character. From a self-categorization view, people will engage in collective emotion regulation to manage the positivity of their social identity. The impetus at the heart of threats to social identity is indeed likely to be collective emotion. A close examination of research on strategies to manage social identity might reveal strategies that regulate collective emotion (Branscombe et al., 1999; Ellemers, Spears, & Doosje, 2002; Tajfel & Turner, 1979). For instance, it is conceivable that social mobility (Tajfel & Turner, 1979) regulates collective guilt, whereas social promotion (Cialdini, Borden, Thorne, Walker, Freeman, & Sloan, 1976) regulates collective pride. With a clearer perspective on collective emotion regulation, researchers will have a richer view on intergroup relations, buttressed from the unfortunate misnomer that social identity is primarily a cognitive notion (Haslam et al., in press; Turner & Reynolds, 2001).

However, developing a coherent account of collective emotion regulation will undoubtedly be a complex undertaking. One possible way to organize the account is

to focus on the distinction between strategies that are mostly stability-oriented, and strategies that are mostly change-oriented. Research on personal emotion regulation will be instructive. For instance, many strategies that people use to regulate emotion seem geared toward maintaining the stability of their present situation. For instance, several researchers have discussed justification and its role in preserving the status quo (e.g., Freud, 1937; Festinger, 1957; Crandall & Eshleman, 2003). Moreover, several researchers have discussed cognitive reappraisal and its role in promoting important change (e.g., Guiliani & Gross, in press; Folkman & Moskowitz, 2004; Ray, Wilhelm, & Gross, 2008). Accordingly, it appears possible that strategies for regulating emotion reflect deeper motivations for promoting or preventing change (Molden et al., 2008).

Assuming that such motivations also underlie collective emotion regulation strategies, it appears plausible that different collective emotions shape the selection of emotion regulation strategies. For instance, should collective guilt entail promotion-focused motivation, then people who feel collective guilt would be more likely to select strategies aimed at ingroup change. This seems consistent with work showing that collective guilt leads to changes in attitudes toward victimized groups (Powell et al., 2005). Conversely, if collective anxiety entails prevention-focused motivation, then people who feel collective anxiety would be more likely to select strategies aimed at ingroup stability. Although little research exists on which emotion regulation strategies will be chosen in a particular situation (Gross, 2007), it seems reasonable that which emotion is operating will play a prime role in the selection.

Reducing Global Warming

Future research focused on reducing global warming could focus on the way that communications about global warming are framed (Moser & Dilling, 2006). For instance, framing inequalities as White privilege, rather than Black disadvantage, lowers modern racism among White-Americans (Powell et al., 2005). Similarly, framing reductions of global warming in terms of future ingroup gains rather than present ingroup losses, should elicit greater willingness to help reduce global warming. In addition, when primed with promotion-focused motivation, people should be more willing to help reduce global warming when such behaviors are framed as promoting ingroup change, than they are framed as preventing ingroup instability. Framing the desired action in terms of predominate motivations should promote greater willingness to engage in behaviors that reduce global warming (e.g., Wohl & Branscombe, 2008a).

Another potential avenue for future research would be to closely examine how self-categorization impacts environmentally-relevant attitudes and values. In attitude-behavior consistency models, these attitudes and values are seen as key motivators of action related to the environment. However, these models do not explain the sources of the attitudes. Self-categorization research suggests that shifts in self-categorization will produce corresponding shifts in environmentally-relevant attitudes toward group norms (e.g., Branscombe, Schmitt, & Schiffhauer, 2007; Lehmiller & Schmitt, 2007; Reynolds & Turner, 2006; Schmitt, Lehmiller, & Walsh, 2007; see also Mischel, 2004 on the contextual sources of stability for internal psychological constructs).

For example, research has shown that political liberalism is related to stronger pro-environmental attitudes (Gifford, 2007; Oskamp & Schultz, 2005). It has likewise shown that Black-Americans are more likely to hold stronger liberal attitudes than White-Americans, and women are more likely to hold stronger liberal attitudes than males. Therefore, self-categorization theory would suggest that Black males who self-categorize as Black would express stronger liberal attitudes than Black males who self-categorize as male. If so, then it is possible that self-categorizing as Black might elicit stronger pro-environmental attitudes and behavior. This seems consistent with research proposing that attitudes are not inherently fixed causes, but rather that they are contextually malleable effects (e.g., Schwarz & Bohner, 2001; Tesser, 1978; Wade-Benzoni, Li, Thompson, & Bazerman, 2007).

Conclusion

Global warming is one of the most significant social concerns of our present times (Oskamp, 2007). Like our predecessors who contributed to the improvement of intergroup relations, present-day researchers are well-positioned to contribute to the reduction of global warming by understanding its underlying social psychology. As with any human-derived problem, global warming has a human dimension that our discipline can illuminate, lending support to broader efforts to find solutions. The present research on collective guilt for future ingroup harm is a small step in this direction. Future researchers have an opportunity to contribute to the reduction of global warming for future generations.

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Appendix A

Scientific Information about Global Warming

Levels of carbon dioxide and other greenhouse gases in the Earth's atmosphere have increased about 70% in recent decades. The vast majority of scientists agree that this increase is largely caused by emissions released during the burning of fossil fuels (such as gasoline, coal, and natural gas). The United States currently releases more emissions than any other country in the world—and the most emissions per person.

High levels of greenhouse gases inside the Earth's atmosphere trap sunlight from space, causing increasingly warmer air and ocean temperatures. This process is called global warming. Warmer temperatures can affect people and nature in many ways, such as—increased extreme weather events (such as storms, heat waves, drought), increased food and water shortages, increased flooding of coastal and river areas (where people work and live), increased pest infestations and disease, and extinction of many plant and animal species. Such impacts of global warming are likely to intensify as the Earth's temperatures continue to rise over time. Further greenhouse gas emissions will likely accelerate global warming and its impacts.

Based on the available scientific evidence, Americans in the future are likely to be confronted by the impacts of global warming during their lifetimes. Studies suggest that Americans' efforts to reduce greenhouse gas emissions over the next several years could reduce at least some of the impacts of global warming on the lives of Americans in the future.

Note. Information presented in Studies 1-2.

Appendix B

Manipulated Information about Global Warming

All conditions

Scientists have long had substantial evidence that the buildup of greenhouse gases in the Earth's atmosphere produces warmer air and ocean temperatures, a process known as global warming. However, scientists have had less evidence about the causes of global warming and its possible impacts on the United States. Recently, scientists from Kansas University's Climate Research Institute (CRI) completed a landmark study examining these issues.

Minor impact/natural cause condition

Using the most advanced climatological technologies available, the CRI study provided strong evidence that global warming is primarily caused by natural processes, such as increases in solar and volcanic activity. Further, the CRI study provided strong evidence that global warming will have only a minor impact on the United States in the future, confined mostly to occasional hot days or some localized flooding. According to top experts, the CRI results are a substantial contribution to climate science and will play an important role in social and political discussions on global warming.

Minor impact/human cause condition

Using the most advanced climatological technologies available, the CRI study provided strong evidence that global warming is primarily caused by human activities, such as the burning of fossil fuels and the consumption of electricity. Further, the CRI study provided strong evidence that global warming will have only a minor impact on the United States in the future, confined mostly to occasional hot days or some localized flooding. According to top experts, the CRI results are a substantial contribution to climate science and will likely play a key role in social and political discussions about global warming.

Major impact/natural cause condition

Using the most advanced climatological technologies available, the CRI study provided strong evidence that global warming is primarily caused by natural processes, such as increases in solar and volcanic activity. Further, the CRI study provided strong evidence that global warming will have a major impact on the United States in the future, due mostly to flooding, drought, or disease. According to top experts, the CRI results are a substantial contribution to climate science and will play an important role in social and political discussions on global warming.

Major impact/human cause condition

Using the most advanced climatological technologies available, the CRI study provided strong evidence that global warming is primarily caused by human activities, such as the burning of fossil fuels and the consumption of electricity. Further, the CRI study provided strong evidence that global warming will have a major impact on the United States in the future, due mostly to flooding, drought, or disease. According to top experts, the CRI results are a substantial contribution to climate science and will play an important role in social and political discussions on global warming.

Note. Information presented in Study 3.

Appendix C

Legitimization Measures

Harm Likelihood (Studies 1-2)

What is the likelihood that global warming will cause distress for Americans in the future?

What is the likelihood that global warming will disrupt the lives of Americans in the future?

What is the likelihood that global warming will make life harder for Americans in the future?

What is the likelihood that global warming will lead to suffering for Americans in the future?

What is the likelihood that global warming will cause harm to Americans in the future?

What is the likelihood that global warming will threaten the well-being of Americans in the future?

Harm Severity (Study 3)

How much suffering do you think global warming will cause for Americans in the future?

How much harm do you think global warming will cause to Americans in the future?

How much damage do you think global warming will cause for Americans in the future?

Collective Efficacy (Studies 2-3)

To what extent do you believe that if Americans today worked together, then they could reduce the impact of global warming on Americans in the future?

To what extent do you believe that if Americans today cooperated with each other, then they could reduce the impact of global warming on Americans in the future?

To what extent do you believe that if Americans today worked as a team, then they could reduce the impact of global warming on Americans in the future?*

To what extent do you believe that if Americans today combined forces, then they could reduce the impact of global warming on Americans in the future?

continued

Collective Responsibility (Studies 2-3)

To what extent do you believe that Americans today are largely responsible for the effects of global warming?

To what extent do you believe that Americans today are largely to blame for the effects of global warming?

To what extent do you believe that Americans today are largely at fault for the effects of global warming?

Collective Legitimacy (Studies 2-3)

To what extent do you believe it is wrong that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?

To what extent do you believe it is unacceptable that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?

To what extent do you believe it is not okay that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?

Note. Item marked with an asterisk did not appear in Study 3.

Appendix D

Collective Emotion Measures

Collective Guilt (Study 1)

To what extent do you, as an American, feel guilty for your contributions to global warming?

To what extent do you, as an American, feel regretful for your contributions to global warming?

To what extent do you, as an American, feel remorseful for your contributions to global warming?

To what extent do you, as an American, feel apologetic for your contributions to global warming?*

Collective Guilt (Studies 2-3)

To what extent do you feel guilty that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?

To what extent do you feel regretful that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?

To what extent do you feel remorseful that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?

To what extent do you feel apologetic that Americans today contribute to greenhouse gas emissions (by driving automobiles, consuming electricity, and in other ways)?*

Collective Anxiety (Studies 1-3)

To what extent do you feel nervous about the impact of global warming on Americans in the future?

To what extent do you feel worried about the impact of global warming on Americans in the future?

To what extent do you feel concerned about the impact of global warming on Americans in the future?*

To what extent do you feel apprehensive about the impact of global warming on Americans in the future?

Note. Items marked with an asterisk did not appear in Study 3.

Appendix E

Green Practices Measures

Vehicle Emissions (Studies 1-2)

To what extent would you be willing to increase the number of times that you carpool with friends or coworkers (vs. drive) each week?

To what extent would you be willing to increase the number of times that you use public transportation (vs. drive) each week, such as buses or commuter trains?

To what extent would you be willing to increase the number of times that you ride a bicycle (vs. drive) each week?

To what extent would you be willing to increase the number of times that you walk (vs. drive) each week?

To what extent would you be willing to reduce the number of miles that you drive each week by going to fewer places or combining trips?

To what extent would you be willing to consider obtaining a more fuel efficient vehicle, such as a hybrid (gasoline and electric) vehicle?

Energy Conservation (Studies 1-2)

To what extent would you be willing to adjust the thermostat in your residence so that it is a little warmer than you like it in the summer?

To what extent would you be willing to adjust the temperature in your residence so that it is a little cooler than you like it in the winter?

To what extent would you be willing to move into a residence that has less square footage than your present residence?

To what extent would you be willing to decrease the amount of time that you use products requiring electricity or batteries each week?

To what extent would you be willing to replace your regular light bulbs with energy-efficient compact fluorescent light bulbs (these are more expensive)?

To what extent would you be willing to adjust the lighting in your residence so that it is a little darker than you like it at night?

To what extent would you be willing to unplug household appliances and electronics with electric indicator lights or clocks when not in use?

To what extent would you be willing to decrease the amount of water that you use during baths and showers?

To what extent would you be willing to allow the temperate of your showers to be a little colder than you like them?

To what extent would you be willing to decrease the amount of time that you leave the water running when you shave or brush your teeth?

Green Household Practices (Study 1)

To what extent would you be willing to purchase more products made with recycled materials (such as paper or plastic)?

To what extent would you be willing to increase the frequency with which you recycle paper, glass, plastic, aluminum, and steel products?

To what extent would you be willing to minimize the amount of solid waste that you produce by using reusable products rather than disposable products (such as cups or napkins)?

To what extent would you be willing to be more minimalist by purchasing fewer products in general?

To what extent would you be willing to purchase more of your food products from local sources (such as Farmer's markets)?

To what extent would you be willing to purchase your own canvas grocery bags to use in place of the plastic bags provided by grocery stores?

To what extent would you be willing to reduce your consumption of meat and dairy products?

Environmental Taxes (Studies 1-3)

To what extent would you be willing to support a $50 per year federal income tax increase, designed to support scientific research on ways to reduce global warming?

To what extent would you be willing to support a $15 per month electricity tax, designed to encourage people to use less electricity?

To what extent would you be willing to support a $300 per year increase in property taxes for homes that fail to meet minimum energy efficiency standards, designed to promote energy efficient maintenance and construction?*

To what extent would you be willing to support a 20¢ per gallon gasoline tax, designed to encourage people to use less gasoline or obtain more fuel efficient vehicles?

To what extent would you be willing to support a $500 per unit tax on people who purchase vehicles that fail to meet minimum fuel efficiency standards, designed to promote the purchase of fuel efficient vehicles?*

To what extent would you be willing to support a 2¢ per mile annual pollution tax for every mile that a person drives, designed to reduce the number of miles that people drive?*

Environmental Advocacy (Studies 1-2)

To what extent would you be willing to learn more about global warming through reading, watching television, or surfing the internet?

To what extent would you be willing to add your name and email to the online global warming march?

To what extent would you be willing to encourage your family and friends to watch a documentary on global warming?

To what extent would you be willing to encourage your family and friends to reduce greenhouse gases and energy consumption?

To what extent would you be willing to join a student group on campus that promotes greater awareness of global warming?

To what extent would you be willing to give a short presentation in an elementary school about global warming and how to reduce it?

To what extent would you be willing to sign a petition encouraging the university to install solar panels on major buildings on campus, even if this would raise student fees by $30 per semester?

To what extent would you be willing to attend a peaceful campus demonstration to encourage the university to obtain at least 25% of their energy from renewable sources (such as wind or solar power), even if this would raise student fees by $50 per semester?

To what extent would you be willing to stop purchasing products from manufacturers or retailers that have poor environmental records?

To what extent would you be willing to make a $40 tax-deductible donation to environmental groups, who lobby politicians to reduce people's contributions to global warming?

To what extent would you be willing to send an email to government officials to encourage them to support policies that reduce global warming?

To what extent would you be willing to vote against politicians with a poor record of helping to protect citizens from global warming?

Note. Items marked with an asterisk did not appear in Study 3.

Appendix F

Debriefing Information Sheet

Thank you for completing the survey.

This research examines how people's beliefs about global warming influences their feelings and willingness to help reduce global warming. In the passage that you read, the information about causes of global warming and extent of its impact on the United States was varied, based on common perspectives in society. The survey said that this information came from a climate center on campus, but this center does not exist, nor are the researchers in this study experts on the causes and impacts of global warming. The researchers apologize for not telling you this earlier, but they needed people to think that the information about global warming was real, to see whether it would impact their feelings or willingness to help.

At this point, the study is over. If you would prefer to keep your survey, then you may do so. This would withdraw you from the study and the researchers could not use your responses in their analyses. If you would like to withdraw, then please take your survey with you when you leave. If you would not like to withdraw, then please give your booklet to the research assistant.

Whatever you choose, the researchers appreciate your time and effort. Thank you.

Note. This information was used in Study 3.

Appendix G

Correlations for Legitimizations, Collective Emotions,
and Green Attitudes and Practices in Study 1

Measure	1	2	3	4	5	6	7
1. Harm	---						
2. Guilt	.65***	---					
3. Anxiety	.77***	.69***	---				
4. Emissions	.40***	.47***	.36***	---			
5. Energy	.48***	.52***	.51***	.57***	---		
6. Household	.46***	.47***	.39***	.59***	.76***	---	
7. Taxes	.34**	.46***	.45***	.42***	.58***	.52***	---
8. Advocacy	.46***	.56***	.55***	.61***	.73***	.65***	.70***
9. Attitudes	.57***	.67***	.58***	.59***	.61***	.63***	.49***

Note. *p < .05. **p < .01. ***p < .001.

Measure	8
1. Harm	
2. Guilt	
3. Anxiety	
4. Emissions	
5. Energy	
6. Household	
7. Taxes	
8. Advocacy	---
9. Attitudes	.71***

Appendix H

Correlations for Legitimizations, Collective Emotions, and Green
Attitudes and Practices within Stability Condition in Study 2

Measure	1	2	3	4	5	6	7
1. Harm	---						
2. Efficacy	.48**	---					
3. Illegitimacy	.47**	.37*	---				
4. Responsibility	.65***	.64***	.68***	---			
5. Guilt	.63***	.56***	.61***	.59***	---		
6. Anxiety	.69***	.56***	.50**	.63***	.78***	---	
7. Emissions	.35*	.51***	.37*	.33*	.57***	.52***	---
8. Energy	.31*	.56***	.55***	.47**	.62***	.43**	.82***
9. Household	.32*	.55***	.55***	.43**	.57***	.51***	.85***
10. Taxes	.22	.36*	.27	.44**	.39**	.36*	.55***
11. Advocacy	.52***	.61***	.45**	.57***	.64***	.64***	.78***
12. Attitudes	.51***	.51***	.47**	.57***	.69***	.71***	.66***

*Note. *p < .05. **p < .01. ***p < .001.*

Measure	8	9	10	11
1. Harm				
2. Efficacy				
3. Legitimacy				
4. Responsibility				
5. Guilt				
6. Anxiety				
7. Emissions				
8. Energy	---			
9. Household	.89***	---		
10. Taxes	.61***	.60***	---	
11. Advocacy	.73***	.76***	.74***	---
12. Attitudes	.59***	.58***	.57***	.73***

Appendix I

Correlations for Legitimizations, Collective Emotions, and Green
SAttitudes and Practices within Change Condition in Study 2

Measure	1	2	3	4	5	6	7
1. Harm	---						
2. Efficacy	.41***	---					
3. Illegitimacy	.64***	.64***	---				
4. Responsibility	.56***	.62***	.57***	---			
5. Guilt	.48***	.64***	.66***	.68***	---		
6. Anxiety	.66***	.58***	.65***	.63***	.68***	---	
7. Emissions	.48***	.42***	.54***	.26*	.36**	.47***	---
8. Energy	.48***	.33**	.56***	.29**	.43***	.56***	.70***
9. Household	.44***	.41***	.53***	.37**	.48***	.62***	.66***
10. Taxes	.51***	.51***	.65***	.56***	.57***	.55***	.50***
11. Advocacy	.58***	.59***	.62***	.55***	.62***	.75***	.53***
12. Attitudes	.57***	.52***	.62***	.44**	.59***	.69***	.61***

Note. *p < .05. **p < .01. ***p < .001.

Measure	8	9	10	11
1. Harm				
2. Efficacy				
3. Legitimacy				
4. Responsibility				
5. Guilt				
6. Anxiety				
7. Emissions				
8. Energy	---			
9. Household	.78***	---		
10. Taxes	.59***	.58***	---	
11. Advocacy	.62***	.69***	.76***	---
12. Attitudes	.69***	.67***	.64***	.75***

Appendix J

Correlations for Legitimizations, Collective Emotions, and Green Attitudes
and Practices within Nature/Minor Condition in Study 3

Measure	1	2	3	4	5	6	7
1. Harm	---						
2. Efficacy	.54*	---					
3. Illegitimacy	.56*	.62**	---				
4. Responsibility	.70**	.31	.57*	---			
5. Guilt	.63**	.71**	.76***	.50*	---		
6. Anxiety	.46	.65**	.73**	.30	.88***	---	
7. Taxes	.65**	.54*	.43	.64**	.59*	.37	---
8. Liberalism	.66**	.74**	.70**	.47	.62**	.53*	.59*

Note. *p < .05. **p < .01. ***p < .001.

Appendix K

Correlations for Legitimizations, Collective Emotions, and Green Attitudes
and Practices within Nature/Major Condition in Study 3

Measure	1	2	3	4	5	6	7
1. Harm	---						
2. Efficacy	.04	---					
3. Illegitimacy	.19	.27	---				
4. Responsibility	.20	.42*	.57**	---			
5. Guilt	.36	.13	.73***	.70***	---		
6. Anxiety	.58**	.35	.16	.16	.23	---	
7. Taxes	.40	.43*	.61**	.50*	.50*	.16	---
8. Liberalism	.10	.29	.15	.47*	.22	-.01	.22

Note. *p < .05. **p < .01. ***p < .001.

Appendix L

Correlations for Legitimizations, Collective Emotions, and Green Attitudes
and Practices within Human/Minor Condition in Study 3

Measure	1	2	3	4	5	6	7
1. Harm	---						
2. Efficacy	.51*	---					
3. Illegitimacy	-.20	.17	---				
4. Responsibility	.43	.09	.09	---			
5. Guilt	.48*	.55*	.46	.47	---		
6. Anxiety	.13	.33	-.21	.21	.21	---	
7. Taxes	.29	.56*	.15	.23	.44	.40	---
8. Liberalism	.57*	.04	-.20	.22	.25	.06	.12

*Note. *p* < .05. **p* < .01. ***p* < .001.

Appendix M

Correlations for Legitimizations, Collective Emotions, and Green Attitudes
and Practices within Human/Major Condition in Study 3

Measure	1	2	3	4	5	6	7
1. Harm	---						
2. Efficacy	.08	---					
3. Illegitimacy	.61**	.24	---				
4. Responsibility	.07	.43	.30	---			
5. Guilt	.75***	.20	.68**	.06	---		
6. Anxiety	.81***	.29	.56*	.06	.74***	---	
7. Taxes	.60**	.05	.66**	.24	.67**	.63**	---
8. Liberalism	.32	.05	.51*	.16	.30	.38	.50*

Note. *$p < .05$. **$p < .01$. ***$p < .001$.