

Bridging the Divide between Positive and Negative: The Effectiveness of Hope and Fear Appeals in Climate Change Communication

Amy E. Chadwick
Ohio University ~ chadwick@ohio.edu

Abstract

The most effective type of emotional appeal for climate change communication is contested. Negative emotional appeals dominate, but have shown mixed effectiveness. Positive emotional appeals are less frequently used, but show promising effectiveness. As a step toward bridging the divide between scholars advocating for positive and negative appeals in climate change communication, this study compared the effectiveness of hope and fear appeals. 650 undergraduate students participated in a between-subject experiment with three study conditions: a hope appeal ($n = 218$), a fear appeal ($n = 216$), and a control message ($n = 216$). The message condition had a significant effect on interpersonal communication intention, $F(2, 648) = 3.02, p = .049$. The hope appeal led to greater interpersonal communication intention than the control message ($p = .018$) and approached significant difference from the fear appeal ($p = .084$). The fear appeal was not significantly different from the control message on communication intention. Participants in the hope appeal condition experienced significantly more post-message self-efficacy than did participants in the control condition ($p = .019$). The fear appeal condition was not significantly different from the hope appeal or control conditions on self-efficacy. The message condition also had a significant effect on anger, $F(2, 648) = 24.91, p < .001$. The fear appeal led to greater anger than either the hope appeal ($p < .001$) or the control message ($p < .001$). The hope appeal also led to greater anger than the control message ($p = .005$). Overall, hope appeals were equally as, or more effective than, fear appeals and created less reactance (anger). The results indicate that hope appeals may be a more effective approach than fear appeals for climate change communication; however, additional research should explore the effectiveness of both appeals for other outcomes, such as behavior.

Keywords: Emotion, Persuasion, Health Communication, Environmental Communication, Message Design, Climate Change, Cognition, Motivation, Hope, Fear

Bridging the Divide between Positive and Negative: The Effectiveness of Hope and Fear Appeals in Climate Change Communication

Climate change is one of the most serious and pervasive environmental challenges facing us today. Currently, regional climate changes, particularly temperature increases, are affecting every continent and most oceans (IPCC, 2013). Not only are current climate changes having effects, but future impacts will also affect humans and the climate systems upon which we depend. In the future, climate changes will affect freshwater resources, ecosystems, food and forest products, coastal and low-lying areas, industry and settlements, and human health (IPCC, 2013). These changes in the climate are the direct and indirect result of human actions.

Human behaviors are responsible for changing the climate, but human behaviors can also mitigate climate change (IPCC, 2013; Steg & Vlek, 2009). Mitigation involves efforts to slow, stabilize, or reverse climate change. Mitigation of climate change requires behavior change on local, national, and global levels by individuals, business, scientists, governments, non-government organizations, and other social and economic players. One important role for communication in mitigating climate change is using persuasive messages to change individual behavior and antecedents to behavior (Chadwick, in press).

Communicators often used emotional appeals to encourage cognitive, affective, and behavioral engagement with climate change mitigation. Although emotional appeals show promise for affecting climate engagement, which emotional appeals are effective is contested. Currently, negative emotional appeals (particularly fear appeals) and catastrophe narratives characterize much of climate change communication (Hulme, 2008; O'Neill & Nicholson-Cole, 2009). Although negative emotional appeals can have positive effects on behavior and antecedents to behavior (Bamberg & Möser, 2007; Meijnders, Midden, & Wilke, 2001a, 2001b), they can also have negative effects (O'Neill & Nicholson-Cole, 2009; Swim et al., 2009). Several researchers (e.g., Chadwick, 2015b; Moser, 2007; Pooley & O'Connor, 2000) have suggested that positive emotional appeals may be more effective than negative emotional appeals for encouraging climate change engagement. Positive appeals lead to more positive attitudes toward climate change mitigation than do negative appeals (Spence & Pidgeon, 2010). Similarly, positive message framing along with uncertainty about outcomes leads to greater intention to engage in mitigation behavior than does negative framing (Morton, Rabinovich, Marshall, & Bretschneider, 2011).

Among positive emotional appeals, hope appeals are particularly promising for encouraging climate change engagement (Chadwick, 2015b; Swim et al., 2009). Hope appeals increase attention to messages about climate change and feelings of hope increase interest in climate change protection (Chadwick, 2015b). Feelings of hope and efficacy are correlated with pro-environmental behaviors and support for climate change policies (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007). Hope also increases the probability that individuals will adopt climate protection beliefs and behaviors (Markowitz & Shariff, 2012; Swim et al., 2009).

Thus, the goals of this study are (a) to better understand hope's potential as a persuasive strategy for affecting behavioral antecedents and (b) to compare the effects of hope appeals with fear appeals. Specifically, this study examines the ability of the two emotional appeals to affect self-efficacy for addressing climate change, intention to communicate about climate protection, information seeking intention, and behavioral intention.

Behavioral Antecedents to Mitigation

Although many individuals and organizations will need to change their behavior to mitigate climate change, young adults are an important target audience for climate change communication. Early adulthood is the time when individuals are most open and susceptible to change (Alwin, 1994; Alwin & McCammon, 2003). Research with U.S. college students and adults 18 to 35 indicate that they are likely to believe in climate change and be somewhat concerned about it, but are unlikely to take any mitigation action and have many misconceptions about the causes and consequences of climate change (Cordero, Todd, & Abellera, 2008; Feldman, Nisbet, Leiserowitz, & Maibach, 2010; Wachholz, Artz, & Chene, 2014). Therefore, young adults are an important audience within which to promote behavior change and engagement with climate change mitigation.

Behavior change and engagement necessary to help mitigate climate change requires cognitive (e.g., knowledge and self-efficacy), affective (e.g., emotions and interest), and behavioral (e.g., information seeking, communication, and behavior) components (Lorenzoni et al., 2007). Engagement is important for individual behavior change as well as for creating public demand for climate change regulation (Ockwell, Whitmarsh, & O'Neill, 2009). Engagement with climate change includes believing that we are capable of addressing climate change (self-efficacy), communicating with others about climate protection, having the motivation to seek information to learn about mitigation, and intending to and actually engaging in mitigation behavior.

Self-Efficacy

People often feel hopelessness regarding climate change and a sense of powerlessness in the face of this global issue (Chadwick, 2010). Lack of self-efficacy and feelings of hopelessness are particularly concerning because they result in a tendency to ignore climate change or to rationalize inaction (Norgaard, 2011). On a specific level, self-efficacy is the degree to which receivers believe that they are able to successfully perform a particular behavior (e.g., a mitigation behavior). On a global level, self-efficacy is the degree to which individuals think they are capable of addressing a problem generally (e.g., climate change). Numerous models of behavior indicate the importance of self-efficacy for developing behavioral intention and engaging in behavior. These theories include the theory of planned behavior (Ajzen, 1991), the health belief model (Rosenstock, 1974), and the integrated model of behavior change (Fishbein & Capella, 2006). According to these theories, stronger self-efficacy is associated with greater behavioral intention and behavior.

Interpersonal Communication

Interpersonal communication is a key aspect of engagement, particularly to create social movements and demand for policy changes (Ockwell et al., 2009). To create a mass movement for change, individuals need to communicate with each other as well as policy makers about climate change and climate protection. It is particularly important to galvanize communication by opinion leaders who can foster individual behavior change as well as encourage citizen demand for regulation (Nisbet & Kotcher, 2009). In addition, communication about global warming is positively associated with information seeking (Mead et al., 2012).

Information Seeking

Despite substantial media coverage of climate change (Boykoff & Boykoff, 2007), many people in the U.S. lack basic information about climate change, have many misconceptions, and are unlikely to take any mitigation action (Feldman et al., 2010; Leiserowitz, 2005). Information seeking is a strong

predictor of knowledge about global warming (Kahlor & Rosenthal, 2009). In addition, information seeking is an effective way of coping with uncertainty (Afifi & Weiner, 2004; Brashers, 2001), which is prevalent in discussions of climatic change. Thus, seeking information is an important part of engagement with climate change.

Behavioral Intention

A clear indicator of climate engagement is the performance of climate protection behaviors. Although not a perfect predictor, behavioral intention influences actual behavior (Ajzen, 1991; Fishbein & Capella, 2006). Thus, climate communication should attempt to influence both mitigation behavioral intention and actual mitigation behavior. One way to influence behavioral intention and climate engagement is through persuasive emotional appeals, including hope and fear appeals.

Hope Appeals

Hope is a discrete, positive emotion that involves appraisals of a future outcome as consistent with goals (*goal congruence*), possible but not certain (*possibility*), important (*importance*), and leading to a better future (*future expectation*) (Chadwick, 2015b). Together, the four appraisals create a perceived *opportunity* and the discrete emotion hope. The perception of an opportunity and the approach action tendency of hope motivate individuals to engage in behavior that allows them to capitalize on the opportunity and achieve a desired future outcome. Through persuasive messages, communicators can influence both perceptions of an opportunity as well as what behaviors individuals take to attain the opportunity.

Like other emotional appeals (e.g., fear appeals as discussed by Witte, 1992; Witte & Allen, 2000), hope appeals have two components – the evocation of the emotion and recommended actions. The two components of a hope appeal are (a) the inducement of hope through the presentation of an *opportunity* and (b) the presentation of *recommended actions* to take advantage of the opportunity and achieve the desired outcome (Chadwick, 2015b). To present an opportunity and induce hope, a message should emphasize that a future outcome (a) is possible, (b) is important, (c) is consistent with the receiver's goals, and (d) will create a more positive future. Because the action tendency of hope is an approach tendency, hope appeals capitalize on this action tendency by presenting *recommended actions* for taking advantage of the opportunity and achieving the desired outcome. The recommended actions component includes information designed to (a) increase the receivers' perception of their ability to perform the recommended action (self-efficacy) and (b) demonstrate the ability of the recommended action to achieve the desired outcome (response efficacy) (Chadwick, 2015b). Thus, a *hope appeal* is a message that (a) creates an opportunity by evoking the appraisals that constitute hope and (b) presents a way for receivers to take advantage of that opportunity (Chadwick, 2015b).

Research on the effects of hope and hope appeals is relatively nascent; however, hope and hope appeals show promise for encouraging climate engagement. Hope appeals increase attention to messages about climate change (Chadwick, 2015b) and increase mitigation behavioral intention and mitigation behavior (Chadwick, 2010). Hope appeals also increase global self-efficacy and interpersonal communication intention (Chadwick, 2015a). In addition, feelings of hope increase interest in climate change protection (Chadwick, 2015b) and are positively correlated with pro-environmental behaviors and support for climate change policies (Lorenzoni et al., 2007). However, positive affect (including hope) is associated with information avoidance, not information seeking (Yang & Kahlor, 2013). Overall, hope appeals and feelings of hope should positively affect antecedents to

climate change mitigation behavior. Therefore, the following hypothesis and research question were posed:

H1: Hope appeals lead to higher self-efficacy, interpersonal communication intention, and behavioral intention than control messages.

RQ1: What is the effect of hope appeals on information seeking intention?

Fear Appeals

Fear is a negatively-valenced emotion that arises from appraisals of a *threat* as significant and personally relevant (Ortony & Turner, 1990). Threat perceptions are a combination of perceived severity, how bad the negative outcome is, and perceived susceptibility, the likelihood that the individual will experience the negative outcome (Witte, 1992). The perception of a threat motivates individuals to engage in behavior that allows them to protect themselves from the threat. Unlike hope, which has an approach action tendency, fear can either result in approach or avoidance behaviors (Witte, 1992).

Effective, theoretically-driven fear appeals contain two parts, the evocation of fear through the presentation of a threat and recommended actions to avert the threat (Witte, 1992). In the threat portion of the appeal, the message presents impending physical, social, psychological, or other harm. The message attempts to make receivers feel that the threat is severe (perceived severity) and that they are vulnerable to the threat (perceived susceptibility). In the second part of a fear appeal, the message presents recommended actions that will alleviate the threat. The recommended actions part of a fear appeal should make receivers believe that the actions will successfully avert the threat (response efficacy) and that they can successfully perform the recommended actions (self-efficacy). However, low perceived efficacy can lead to maladaptive responses that might include denying the threat (e.g., climate change is a hoax) or believing that they are not vulnerable to the threat (e.g., it will not happen in my lifetime) (Witte, 1992).

Fear appeals are frequently used in persuasive communication, particularly in health communication (see Witte & Allen, 2000 for review). In the context of health, fear appeals can increase the salience of an issue, behavioral intention, and behavior (Witte & Allen, 2000). In the context of energy conservation, moderate and high levels of fear lead to positive attitudes toward energy-saving bulbs (Meijnders et al., 2001a). In addition, evoking fear also leads to systematic processing of risk information which results in more favorable attitudes toward energy conservation (Meijnders et al., 2001b). Perceived severity of climate change significantly predicts pro-environmental behavioral intention for both American and Korean students; however, perceived susceptibility to climate change does not (Kim, Jeong, & Hwang, 2013). Therefore the following hypothesis is posed:

H2: Fear appeals lead to higher self-efficacy, interpersonal communication intention, information seeking, and behavioral intention than control messages.

Both hope and fear appeals are expected to positively affect indicators of engagement with climate change. However, it is unclear how effective they will be in comparison to each other. Therefore, the following research question is posed.

RQ2: Which emotional appeal (hope or fear) is most effective at influencing self-efficacy, interpersonal communication intention, information seeking, and behavioral intention?

Despite the positive effects that fear appeals have, they can often be counterproductive, leading to maladaptive attitudes and behaviors such as denial, derogation of the message source, selective exposure, and paralysis (Swim et al., 2009; Witte, 1992). Messages that emphasize severe, catastrophic climate threats can decrease concern and increase hopelessness (Hart & Nisbet, 2012; O'Neill & Nicholson-Cole, 2009) and do not motivate engagement with climate change (O'Neill & Nicholson-Cole, 2009). This disempowerment can lead to less action because people are not likely to take action if they think it will make no difference (Moisander, 2007). Fear appeals can also lead to reactance, which is the tendency to try to restore threatened freedoms, often by doing the opposite of what is advocated for in messages (J. W. Brehm, 1966; S. S. Brehm & Brehm, 1981). Reactance has been operationalized and measured as a combination of anger and negative cognitions (Dillard & Shen, 2005). Based on the likelihood of fear appeals causing reactance, the following hypothesis was posed:

H3: Fear appeals lead to greater anger than control messages.

Because researchers (e.g., Chadwick, 2015b; Moser, 2007; Pooley & O'Connor, 2000; Swim et al., 2009) have called for more positive appeals and anticipated that positive appeals will avoid the negative effects of fear appeals, the following hypothesis is posed:

H4: Hope appeals lead to less anger than fear appeals.

Methods

This study examines and compares the ability of hope and fear appeals to affect self-efficacy for addressing climate change, intention to communicate interpersonally about climate protection, information seeking intention, and behavioral intention. The study was a between-subject experiment in which 650 undergraduate students responded online to questions before and after reading stimulus messages. Participants were randomly assigned to one of the three study conditions: a hope appeal ($n = 218$), a fear appeal ($n = 216$), or a control message ($n = 216$). Messages, methods, and measures were pilot tested prior to this study. Messages and measures are available from the author.

Participants

Participants were a convenience sample of 650 undergraduate students recruited through a subject pool. For inclusion, participants had to be at least 18 years old. Participants ranged in age from 18 to 34 years old with 97.3% of respondents falling between the ages of 18 and 22 ($M = 19.4$, $SD = 1.36$). Half the participants were female ($n = 325$, 50.0%) and half were male ($n = 321$, 49.4%). Most participants identified as Caucasian-American or White ($n = 569$, 87.5%). When asked whether they considered themselves to be environmentalists, 8.5% ($n = 55$) agreed or strongly agreed with this identity.

Stimulus Messages

The stimulus messages were two emotional appeals (hope and fear) and an attention control message. As mentioned previously, emotional appeals contain two parts (a) the evocation of the emotion and (b) the presentation of recommended actions that capitalize on the emotion. For the two emotional appeals, the recommended actions portion of the message was identical and only the evocation of the emotion varied between conditions. For both emotional appeals, the evocation of the emotion was four paragraphs long. The length, readability, and format were consistent across the messages.

Hope Appeal

Hope appeals evoke hope through the presentation of an opportunity. The evocation of hope portion of the message had four paragraphs, each one designed to evoke one of the four appraisals associated with hope. The importance paragraph connected the climate to health and finances, two issues that formative research (Chadwick, 2010) found were relevant to college students. The goal congruence paragraph connected protecting the climate to saving money. The future expectation paragraph described how much better the future would be if we protected the climate. The possibility paragraph stated that it is likely that people can make the climate better. Because climate change is a global issue that requires the effort of numerous actors, this paragraph connected likelihood to many people around the world who are already taking action to protect the climate.

Fear Appeal

Fear appeals evoke fear through the presentation of a threat. The first paragraph of the message threatened participants with extreme weather events that could destroy their homes and hurt or kill them or those they care about. The second paragraph focused on negative health effects that are likely to arise due to climate change. The third paragraph focused on how climate change will cost money and decrease quality of life. The fourth paragraph focused on susceptibility, indicating that the participants were likely to experience negative effects of climate change.

Recommended Actions

The recommended actions portion of the message was the same for both of the emotional appeals and presented four behaviors that could help mitigate climate change. Formative research (Chadwick, 2010) guided choices for the recommended behaviors in the message, identifying behaviors that students can perform regardless of their living situation. The four mitigation behaviors included two behaviors that focused on reducing energy use (turning off computers when they are not in use and unplugging cell phone chargers when they are not in use) and two behaviors that focused on reducing the use of plastic (bringing a reusable bag to the grocery store and using a reusable water bottle rather than plastic bottles). To increase response efficacy, the message included information about how each behavior could help mitigate climate change. To increase self-efficacy, the behaviors were described as simple and easy.

Attention Control

The attention control message was about bookbinding, a topic that is unlikely to induce emotional reactions. The attention control message was equivalent to the experimental messages in length, readability, and appearance. Unlike a no-message condition, the control message controlled for the effects on the dependent variables of participant expectancy and the attention given to the experimental group (Bootzin, 1985; Gross, 2005).

Procedures and Survey Instrument

After reading and agreeing to an IRB-approved consent form, participants completed the survey entirely online. Participants first completed measures of their current climate protection behaviors and self-efficacy for preventing climate change. Then participants read one of the emotional appeals or the control message. After reading the message, participants provided their emotions and completed measures of message clarity. Then, they indicated their self-efficacy, information seeking intention, communication intention, behavioral intention, and environmental identity. Analyses showed the items and scales to be normally distributed, internally consistent, and unidimensional.

Environmental Identity

Participants indicated their environmental identity by responding to five, seven-point Likert-type items. Four items measured identification with the general environmental movement (e.g., I consider myself to be an environmentalist) and one item measured identification with the climate protection movement. The items were averaged to form a unidimensional, internally consistent scale ($M = 4.39$, $SD = 1.06$, $\alpha = .84$).

Behavior

Participants reported the frequency of their current climate protection behaviors by responding to eight items measured on a seven-point scale. Participants reported their behavior in the past 30 days on the four target behaviors as well as four additional behaviors. These items were not intended to form a unidimensional scale, but rather are an index of behavior ($M = 3.38$, $SD = 1.09$, $\alpha = .69$).

Message clarity

After reading the message, participants indicated the perceived clarity of the message using five seven-point semantic differential items. Each item followed the stem, "The message I read was..." Example items included *very clear/very unclear*, *very easy to read/very hard to read*, and *very complicated/very straightforward*. The items were averaged to form a unidimensional, internally consistent scale ($M = 5.27$, $SD = 1.09$, $\alpha = .89$).

Global Self-Efficacy

Participants indicated their overall confidence in their ability to protect the climate by answering seven seven-point Likert scale items. For example, participants responded to the statement, "I can very easily help protect the climate." The items were averaged to form a unidimensional scale (pre-message: $M = 4.51$, $SD = 1.00$, $\alpha = .82$; post-message: $M = 4.57$, $SD = 1.00$, $\alpha = .81$).

Emotion

Participants indicated their subjective feelings of hope, fear, and anger by responding to nine seven-point Likert scale items. All the items followed the stem, "When I read this message, I felt" The three subjective feeling scales were *hope* (hopeful, optimistic, encouraged; $M = 4.12$, $SD = 1.23$, $\alpha = .86$), *fear* (fearful, worried, afraid, anxious; $M = 3.74$, $SD = 1.31$, $\alpha = .90$), and *anger* (angry, mad; $M = 3.43$, $SD = 1.42$, $\alpha = .90$).

Interpersonal Communication Intention

Participants indicated how likely they were in the next 30 days to communicate about climate change and climate protection with friends or family members. For example, participants indicated agreed or disagreed with the statement, "In the next 30 days, I am likely to initiate a conversation about climate change with a friend." The 10 items were measured on a seven-point Likert scale. The items formed a unidimensional scale ($M = 3.74$, $SD = 1.47$, $\alpha = .97$).

Information Seeking Intention

Six seven-point Likert scale items measured how likely participants were in the next 30 days to seek information about climate change and climate protection. For example, one item stated, "In the next 30 days, I am likely to search for more information about ways to protect the climate." The items were averaged to form a unidimensional scale ($M = 3.87$, $SD = 1.54$, $\alpha = .96$).

Behavioral Intention

Participants indicated how likely they were to engage in the four target behaviors in the next 30 days. The stem “In the next 30 days, I intend to...” was followed by the four behaviors (turning off computers, unplugging cell phone chargers, using reusable grocery bags, and using a reusable water bottle). The response options were a seven-point Likert scale. The items were intended to be an index of behavior intention, not a unidimensional scale ($M = 5.12$, $SD = 1.26$, $\alpha = .80$).

Results

Preliminary Analyses

Equivalency of Groups

A MANOVA assessed the equivalency of the groups on pre-message appraisals, length of time spent reading the message, message clarity, and pre-message self-efficacy. There were no significant differences between the message conditions on any of the four pre-message appraisals (importance, goal congruence, future expectation, and possibility) nor were there significant differences in terms of time spent reading the message or self-efficacy. However, there was an unintended significant difference in perceived message clarity between the emotional appeals and the control message, $F(2, 647) = 33.53$, $p < .001$, partial $\eta^2 = .09$. The hope appeal ($M = 5.61$, $SE = .07$) and the fear appeal ($M = 5.38$, $SE = .07$) were perceived to be clearer than the control message ($M = 4.81$, $SE = .07$), but did not significantly differ from each other. Given the unintended difference, message clarity was a covariate for all analyses that assessed the effects of the message conditions.

Manipulation Checks

Although the messages are defined by intrinsic factors as recommended by O’Keefe (2003) rather than by their effects, it was anticipated that the hope appeal would generate more hope than the fear appeal or control and the fear appeal would generate more fear than the hope appeal or control. A MANCOVA tested the effects of the messages with the message condition as the independent variable, feelings of hope and fear as the dependent variables, and message clarity as the covariate. The hope appeal generated significantly more hope ($M = 4.76$, $SE = .08$) than did either the fear appeal ($M = 3.89$, $SE = .08$) or the control message ($M = 3.69$, $SE = .08$), $F(2, 646) = 51.57$, $p < .001$, partial $\eta^2 = .14$. Similarly, the fear appeal generated significantly more fear ($M = 4.32$, $SE = .08$) than did either the hope appeal ($M = 3.78$, $SE = .08$) or the control message ($M = 3.12$, $SE = .09$), $F(2, 646) = 49.98$, $p < .001$, partial $\eta^2 = .13$.

Substantive Analyses

A between-subjects multivariate analysis of covariance on four behavioral antecedents tested the hypotheses and research questions. The independent variable was message condition (hope, fear, control) and the covariate was message clarity. The dependent variables were interpersonal communication intention, information seeking intention, self-efficacy, and behavior intention. Results of the evaluation of assumptions of normality, homogeneity of variance-covariance matrices, linearity, multicollinearity, and covariate reliability were satisfactory.

There was a statistically significant difference between the message conditions on the combined dependent variables, $F(9, 1282) = 6.43, p < .001$; Wilks' Lambda = .91; partial eta squared = .05. When the results for the dependent variables were considered separately, interpersonal communication intention, $F(2, 648) = 3.02, p = .049$, partial eta squared = .01 and anger, $F(2, 648) = 24.91, p < .001$, partial eta squared = .07 achieved statistical significance. Post-message self-efficacy approached, but did not achieve statistical significance, $F(2, 648) = 2.86, p = .058$, partial eta squared = .01. There were no significant differences between the message conditions on information seeking intention or behavior intention. See Table 1 for adjusted means and standard errors by condition.

The adjusted means indicate that people in the hope appeal condition experienced significantly greater interpersonal communication intention than did participants in the control condition ($p = .018$). The difference between the hope appeal and fear appeal conditions approached but did not achieve significance ($p = .084$). The fear appeal and control conditions were not significantly different ($p = .461$). Thus, hypothesis 1 was partially supported, but hypothesis 2 was not.

Participants in the hope appeal condition experienced significantly more post-message self-efficacy than did participants in the control condition ($p = .019$). The fear appeal condition was not significantly different from the hope appeal or control conditions. Thus, hypothesis 1 was partially supported, but hypothesis 2 was not.

Participants in the fear appeal condition experienced significantly more anger than did participants in the hope appeal ($p < .001$) and control conditions ($p < .001$). Participants in the hope appeal condition experienced significantly more anger than did participants in the control condition ($p = .005$). Thus, hypotheses 3 and 4 were supported.

Table 1

Adjusted Means and Standard Errors for the Dependent Variables by Condition

	Hope		Fear		Control	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Self-Efficacy	4.67 ^a	.07	4.59 ^{ab}	.06	4.44 ^b	.07
Interpersonal Communication Intention	3.94 ^a	.10	3.70 ^{ab}	.10	3.59 ^b	.10
Information Seeking Intention	4.02 ^a	.11	3.84 ^a	.11	3.77 ^a	.11
Behavioral Intention	5.20 ^a	.09	5.09 ^a	.09	5.08 ^a	.09
Anger	3.38 ^a	.09	3.93 ^b	.09	3.00 ^c	.10

Note. Means are adjusted for message clarity. Means with the same superscript are not significantly different. Those with different superscripts are significantly different at $p < .05$.

Discussion

As a step toward determining the most effective persuasive strategies for increasing engagement with climate change, this study explored and compared the ability of hope and fear appeals to affect behavioral antecedents and indicators of climate engagement. The results indicate that hope appeals may be a more effective approach than fear appeals for climate change communication. Although there is still much theoretical and empirical work needed to identify the most effective persuasive strategies for communicating about climate change, this study takes us one step closer to identifying the most effective methods.

Effects of Hope Appeals

The hope appeal led to interpersonal communication intention and self-efficacy for mitigating climate change. Previous research has shown that hope is a positive predictor of both interpersonal communication intention and self-efficacy. Thus, the mechanism through which hope appeals affect these outcomes is likely to be the degree of hope evoked. Future research should examine mediation and moderation models to determine the mechanisms behind the effects of hope appeals.

Although the hope appeal affected interpersonal communication intention and self-efficacy, it did not affect information seeking intention or behavioral intention. The lack of effect of the hope appeal on information seeking might be explained by research that indicates that positive affect (which included hope among other positive discrete emotions) is associated with information avoidance (Yang & Kahlor, 2013). The findings of this study also conflict with previous research which showed a positive effect of hope appeals on behavior and behavioral intention (Chadwick, 2010). However, previous research compared the hope appeals only to a control condition, not to fear appeals as well. Future research should continue to examine the effects of hope appeals and compare them to other emotional appeals, such as fear and guilt appeals, to determine the circumstances in which hope appeals do affect behavioral intention and behavior.

Effect of Fear Appeals

In this study, the fear appeal was ineffective or detrimental. This finding matches with previous research showing that fear appeals have no effect on interest in climate change, communication intention, information seeking intention, or behavioral intention (Chadwick, 2015a). However, the results are counter to findings that negative affect influences information seeking (Yang & Kahlor, 2013). Additional research should examine the mechanisms through which emotion affects information seeking to determine under what circumstances hope and fear appeals might be effective at evoking information seeking. The findings in this study also differ from previous research which indicates that fear and fear appeals increase behavioral intention (Kim et al., 2013; Witte & Allen, 2000). Overall, the results indicate that fear appeals are largely ineffective and by increasing anger can even be detrimental to engagement with climate change. This overall finding matches with previous findings and concerns about fear appeals in the context of climate change (e.g., Hart & Nisbet, 2012; Moisander, 2007; O'Neill & Nicholson-Cole, 2009).

Implications for Climate Change Communication

This study has implications for the development of climate change communication to increase engagement. Evoking hope is the superior method for increasing intention to communicate interpersonally about climate change and self-efficacy for mitigating climate change. Evoking fear is

ineffective or detrimental (anger). Therefore, communicators are encouraged to utilize hope appeals to evoke hope when trying to encourage climate engagement. Although fear appeals overall performed poorly, communicators should not necessarily avoid all negative emotional appeals as possible communication strategies. Guilt appeals, in particular, have shown promise as an effective method for increase climate change engagement (Chadwick, 2015a).

Effect Sizes

Under Cohen's (1988) guidelines for classifying effects as small, medium, or large, the effects reported in this study are "small." However, this does not mean that the effects lack practical significance. Considering that persuasion campaigns, such as those used in environmental and public health communication, use multiple messages and reach audiences of millions, a small effect from a single message translates into a substantial practical impact.

Strengths, Limitations, and Future Directions

The results from this research are contextualized by its strengths and limitations. The major strength of this study is the examination of two emotional appeals in the same experiment, enabling the comparison of the appeals, unlike the more common technique of comparing one emotional appeal to a control. This comparison enabled the identification of which appeal is most effective for which engagement outcome. Future research should continue to compare emotional appeals to each other to determine the most effective approaches to encouraging engagement with climate change.

Conclusion

Climate change is a serious and pervasive social issue that requires cognitive, affective, and behavioral engagement by numerous actors. Persuasive communication can encourage engagement with climate change as well as create demand for climate protective policies. The results from this study indicate that hope appeals have the potential to be an effective strategy for encouraging aspects of cognitive, affective, and behavioral engagement with climate protection. However, evoking fear was generally ineffective or detrimental. Although there is much more to be done to understand the effects and effectiveness of emotional appeals on climate engagement, this study took an important step toward determining the most effective persuasive strategies for increasing engagement with climate change.

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