

The Effectiveness of Loss Framing and Fear Appeal in Motivating Climate Action

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Author Bio

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Abstract

Current climate change communication involves various forms of framing: outcome framing, attribute framing, and point-of-reference framing. The focus of this paper will be on loss framing, a type of outcome framing. Past research on loss framing, including fear appeals, generally agrees that loss framing leads to suppression and denial of climate change information. This study aimed to determine whether fear appeal, a type of loss framing, effectively motivates people indirectly affected by climate change to take action. This review paper analyzed the results of 11 papers found on August 26, 2023, on ScienceDirect, with the keywords “climate change,” “fear appeal,” and “media” filtered for research articles. The results indicated that the papers reviewed generally found that either loss framing is effective on its own, loss framing is effective with specific solutions, that the effectiveness of loss framing may vary, or that motivational framing is more effective. This paper concluded that, generally, loss frames are more effective than motivational frames, but the effectiveness depends on the specific situation and group. There is a gap in the research concerning the effectiveness of loss framing climate change media, specifically on people indirectly experiencing climate change.

Keywords: Fear appeal, climate change, message framing, loss framing, pro-environmental behavior, outcome framing, climate action, media

Introduction

Since the 1800s, climate change, referring to “long-term shifts in temperature and weather patterns” (United Nations, 2023), has become increasingly anthropogenic, fundamentally due to the burning of fossil fuels. When burned, fossil fuels release greenhouse gases covering the Earth, trapping inside heat and raising temperatures (United Nations, 2023). Rising temperatures intensify extreme weather events such as droughts, heat waves, and large storms (Environmental Protection Agency, 2023). There is also severe biodiversity loss as climate change has become the greatest threat to coral reef systems (Suess et al., 2024), leading to warming waters that cause coral bleaching and microorganism growth. Furthermore, hurricanes and storm surges can lead to widespread damage to the already weak reef systems - damages well beyond the level that coral reefs can recover from (Gouezo et al., 2019).

To mitigate the effects of climate change, 175 countries signed the Paris Agreement of the United Nations Framework Convention on Climate Change, which proposed to hold global temperatures 2°C above pre-industrial levels, with 1.5°C being optimal. However, even if every country that signed the Paris Agreement met its national goals, there would still be a much greater warming of 3.2°C above pre-industrial levels. The Intergovernmental Panel on Climate Change (IPCC) - the part of the United Nations dedicated to studying the science behind climate change - published in its Sixth Assessment Report in 2021 that global surface temperature had reached 1.1°C above 1850-1900 temperatures in 2011-2020 (Calvin et al., 2023). The problem is that climate change is a global, collective problem requiring everyone to take action (Kundzewicz et al., 2020). The uncertainty of it also requires effective communication to motivate people to cut down on emissions (Kundzewicz et al., 2018).

What has become increasingly important to cutting down emissions is the communication of climate action to the general public. The environment is advertised to the public through various forms of media: films, news articles, social media, and the internet. Such advertisements can potentially motivate climate and sustainable actions (VanDyke & Tedesco, 2016). Environmental media is particularly useful

in convincing the public to recognize and engage in environmental protection (Ketelsen et al., 2020). However, it is impossible to present information about climate change neutrally without any context, so the way information is framed is crucial; it can place greater emphasis on an issue so that the audience can easily identify why the issue matters to them (Spence & Pidgeon, 2010). The most cited definition of message framing is “selecting some aspects of a perceived reality and mak[ing] them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” (Entman, 1993). Combined with specific characteristics of the target audience, message framing can “substantially enhance adoption intentions for the advocated behavior” (Nab et al., 2020). This research was primarily concerned with investigating outcome framing, a type of message framing.

Outcome Framing

In outcome framing, the goal of the message is framed in terms of gains or losses. However, there are two different proposed explanations and effects of outcome framing. In the context of Amos Tversky and Daniel Kahneman’s prospect theory, the effectiveness of either gain or loss framing depends on how risky it is to behave that way (Levin et al., 1998). When a behavior is risky, using a loss frame is more effective, whereas if the behavior is seen as safe or less risky, using a gain frame is more effective (Levin et al., 1998). Segev et al. found that under the assumption that pro-environmental behavior (PEB) is a preventive behavior, using a gain frame is more effective, which is in congruence with prospect theory. The other explanation is based on negativity bias, which asserts that negative messages are more impactful than equally positive messages (Spence & Pidgeon, 2010). Based on negativity bias, loss frames would be more effective. Fear appeals are a type of loss framing because they emphasize negative consequences (Tannenbaum et al., 2015). These appeals emphasize a threat to produce an “extreme emotional response” (Wilson et al., 1988). In the context of climate change media, fear appeals are warning-based, environmentally shocking, and past-oriented, depicting disastrous outcomes due to past unsustainable actions (Shen et al., 2020). Experimental evidence from psychology suggests that fear framing

is effective in causing many different behavioral changes. The greater the level of fear, the greater the behavioral change (Spence & Pidgeon, 2010). Another study (Groenendyk & Banks, 2014) argues that fear increases cognitive vigilance, which helps individuals adapt to threats. However, this behavior is dropped if the threat cannot be resolved. Even though fear fuels individuals to think about a problem, this does not lead to enough collective action to tackle climate change. Some have even argued that fear-inducing messaging does not lead to any action but the suppression and denial of climate change information (Janković & Schultz, 2017). When the stressor is portrayed as uncontrollable, as in the case of fear appeals, it can lead to maladaptive coping, such as denial and giving up (Folkman et al., 1986), and it can harm the credibility of the message (Bults et al., 2011). The view that fear appeal leads to suppression of climate change information aligns with findings from evolutionary and psychological research, which state that suppression is a way to cope with uncertainty, a fear that would otherwise obstruct daily activities (Schaller & Crandall, 2004). Stennet (Stennett, 1957) suggests that there might be an optimal level of fear to motivate climate action.

The current research tried to investigate primarily 1) the effectiveness of loss framing, especially fear appeal, in eliciting pro-environmental behaviors in people indirectly affected by climate change and 2) if there are other factors, in addition to outcome frames, that affect climate change messages.

Methodology

The papers reviewed in this study were collected on August 26th, 2023, through ScienceDirect, a peer-reviewed journal article database. They were filtered to include only research articles with the keywords “climate change,” “fear appeal,” and “media.” The search yielded 51 research articles, 40 of which were discarded because of irrelevancy to this study: their research primarily focused on investigating the impact of message framing on people directly affected by climate change, renewable or sustainable energy, risk communication about COVID-19, or had no mentions of the media’s role in motivating climate action. All the papers were summarized. The main results on fear appeal were analyzed and grouped into four categories based on

their position on the effectiveness of fear appeal.

Results

This review found that out of the 11 papers analyzed, the most common findings were that 1) loss frames, including fear appeals, are effective in motivating climate action (27.27%) 2) loss frames paired with specific solutions to climate change are effective (27.27%) 3) there are situations when loss frames are more effective than gain frames and vice versa (18.18%) 4) motivational messaging is more successful than fear appeal framing (18.18%).

Loss frames are effective on their own

A study conducted by Howell (2011) measured viewers’ responses to the film *The Age of Stupid*, which presents a dystopian future devastated by climate change and highlights the problems with current fossil fuel dependency. The film uses a fear appeal narrative and does not explicitly give viewers answers on how to respond to issues raised in the film or how to lobby politicians. The study utilized a pre/post-test approach where a questionnaire was given to viewers to obtain their initial opinions before they watched the film. After, two post-test questionnaires were sent out: one immediately after the film and one 10-14 weeks after to test whether the film had lasting effects and inspired viewers to take action. In the second questionnaire, the study asked participants whether their concern had increased: 17.4% replied “No”, 30.3% ticked “Yes, a bit” and 52.3% stated “Yes, a lot” (Howell, 2011). On the last questionnaire, participants demonstrated more action: 4.4% more people had donated money to a climate change organization in the past year. However, these actions required less effort, money, or time. Despite popular views that fear appeal media leaves people overwhelmed, this study found that respondents left the film with increased motivation to take action and felt more empowered to do so. The results could be argued to show the considerable success of fear appeal films, as 11.7% of respondents reported cutting down on driving and 8.6% on reducing their meat consumption (Howell, 2011). However, this could just reflect changes in social norms. The findings also cannot be generalized to the public as the participants represent a group highly concerned with climate change who took action even before the study.

Another study by Booyesen et al. (2019) investigated household behavioral responses to droughts communicated through official announcements on water restrictions and public mentions of the topic on social media. In 2017, Cape Cod became notorious for the prospect, “Day Zero,” that it would run out of municipal water. In response, from November 2016 to February 2018, the City of Cape Cod Town implemented six water restrictions from Level 3 to Level 6B (Booyesen et al., 2019). After the city publicly announced the disaster plan, there was a stream of alarmist articles in the media, voicing their distrust in the policy. Water usage fell for three weeks following the media surge. The usage then decreased during the second week of December, consistent with the slight increase in media coverage. Social media and search term analysis found that the three-phased disaster plan that warned of dire outcomes elicited the biggest response from users, not restrictions or tariffs. Although inciting fear was risky, the study argued it may have been “the single most successful intervention in effecting profound behavioral change amongst citizens” (Booyesen et al., 2019).

The final study by Shen et al. (2020) that found results in favor of fear appeals had the goal of researching how to make green advertising campaigns more effective. The study found that advertising appeal has a significant effect on attention. More attentional resources were used in processing warning-based appeals than vision-based ones, implying an advantage for warning-based appeals. They increase people’s environmental concerns and pro-environmental value orientation, potentially leading to pro-environmental behaviors (Shen et al., 2020).

Loss frames are effective when the audience is given specific solutions

The main objective of a study conducted by Suess et al. (2024) was to find the effect of fear-appeal media on participants’ emotions and following intention for pro-environmental behaviors. Three 2-4 minute fear-appeal video message treatments were used to measure participants’ intention to donate to coral reef restoration efforts. There were three conditions: Condition 1 included a high level of threat messaging and reassurance messaging, Condition 2 included a higher level of threat messaging with a lower level of reassurance messaging, and Condition 3 included a lower level of threat messaging and a high level of reassurance messaging.

Emotional responses were self-reported immediately after watching and measured using 11 items on 5-point bi-polar scales. The data was collected from the U.S. public from a panel on Qualtrics, which stores a database of over 30 million panelists who self-select to participate in different studies. Self-selection bias was minimized by sending out screening questions that randomly assigned participants to a survey without telling them the topic. The study found that the highest donations observed were in Condition 1 and 2, where higher proportions of threat messaging were included (Suess et al., 2024). Arousal, a salient driving force of donation intentions, also increased in Condition 1 and 2, but threat appraisal was only significantly associated with arousal in Condition 2 (Suess et al., 2024). Negative-affectivity (negative emotions) emotional responses were related to increased donation intentions among videos where the ratio of threat-messaging was higher. However, this relation was not found in fear-appeal videos with higher ratios of reassurance messaging. In contrast, coping appraisal was associated with arousal in all conditions: arousal was significantly higher in conditions that included solution-oriented messaging. Another interesting link was that participants who had vacationed in a coral reef destination showed high levels of stated donations, \$2.62 more in Condition 1 and \$1.66 more in Condition 3, than those who had never vacationed in a coral reef destination. The study concluded that video messaging should introduce threats before presenting solutions.

In another study, 1182 Australian residents sourced by Qualtrics responded to a survey that assessed a broad range of participants’ values, beliefs, and affective responses in the context of climate change. Participants were first presented with messages categorized based on the absence of six qualities, including direct reference to climate change, specific advice on taking action, and strong negative emotive content promoting adaptive responses to climate change in Australia. After viewing, participants were assessed on whether the messages led to perceptions of threat, efficacy, rejection, or intentions to adapt. The results indicated that there were three audience segments: alarmed (34.4%), which were people engaged in more adaptive behaviors and expressed the most support for climate change funding; uncommitted (45.2%), which were people engaged in more adaptive behaviors and were

more supportive for climate change funding than the dismissive group; and dismissive (20.3%) about climate change (Hine et al., 2016). The effect of the messages varied depending on whether the audience was alarmed, uncommitted, or dismissive about climate change; even subtle variations in messages lead to drastic differences in responses. However, consistent across all three audience segments was that providing specific adaptation advice and negative emotive content were “significantly associated” with more adaptation (Hine et al., 2016).

Effectiveness of Frames Vary

In a study focusing on attribute and outcome framing in the context of climate change, 161 psychology students completed a series of questions about climate change where they were presented information from IPCC’s (2007) fourth assessment report in terms of losses or gains and local or distant impacts. The results indicated that, directly, gain frames produced higher perceived severity of the impacts of climate change and more positive attitudes toward mitigation than loss frames (Spence & Pidgeon, 2010). Indirectly, loss frames produced more fear responses, increasing perceived severity and higher recall of information. This, in turn, led to a positive association with attitudes toward climate mitigation. Nonetheless, gain frames are more effective when fear responses and information recalled are controlled. There is a systematic advantage in presenting information in a gain frame, with results consistent with prospect theory (prevention behaviors are construed as low risk, so gain frames better prompt them).

(Nab et al., 2020) conducted a study that used outcome framing (emphasizing gain versus losses) and point-of-reference framing (emphasizing benefit for self versus. for the environment) to see whether they can positively influence, in both the short-term and the long-term, homeowners to use more sustainable energy solutions. In this study, environmentally significant behaviours were considered to be investing in insulation and alternative heating systems. The study found that short-term intention to invest in alternate energy is higher in a self/loss condition than in self/gain and higher when the message is presented in a gain frame to someone with a promotion focus. However, when the message is presented to someone with a preventative focus, loss frames yield higher

short-term intentions to invest (Nab et al., 2020). Neither the outcome frame nor the point of reference affected message effectiveness directly. This finding was consistent with the results found on long-term intention.

One article on adaptive coping, which are ways people can manage stress whilst still having good well-being (Mah et al., 2020), suggested that there is no right way to communicate climate change. Still, there are general rules that can be followed to have more effective communication. If messages want to incorporate fear appeals, they should also state the severity of the threat, the individual’s likelihood of being affected, and what they should do to mitigate it. Messages should embrace uncertainty; instead of focusing only on the worst-case scenario, messages should present multiple scenarios and their possible solutions. Interventions designed to increase people’s capacity to cope should be customized for a target audience because people have constant ways to cope that will impact how they deal with climate change stressors. There is no single way to effectively communicate adaptive coping, as no single climate change stressor impacts everyone to the same extent. Not only are there variable stressors, but also variable individual responses and coping. There must also be adaptive coping mechanisms designed for individuals and a collective group because individual, community, and ecosystem resilience are essential to the collective resilience to climate change. So, messages should not burden the individual but instead find ways that the community can adaptively cope.

Loss frames are less effective than motivational frames

The last predominant result was that motivational or gain framing is more effective than loss framing in promoting climate action. In a study measuring the influence of motivational or sacrifice framing on perceived “competence, engagement, and behavioral intentions” (Gifford & Comeau, 2011) for home and transportation-based mitigation behaviors, 1038 residents of Ontario, Canada, were recruited through a random sample purchased from a commercial polling organization. The results showed stronger perceived competence, climate change engagement, and intentions to change behavior over the next year with motivational framing (Gifford & Comeau, 2011). If messages cannot target a specific

population, there is more value in using motivational messages.

Another study specifically focused on *atmosfear*, which is the use of discursive practices to scare people into taking climate action that can influence decision-makers to be more likely to act in favor of mitigating climate change. The study concluded that the negative framing of *atmosfear* can be counterproductive in many ways (Kundzewicz et al., 2020). Negative framing overemphasizes extremes and does not inform people of the risks.

This research paper has presented the existing literature on the effect of fear appeal media about climate change on people indirectly affected by climate change. Fear appeal is effective to a certain extent in motivating pro-environmental behaviors indirectly. However, the extent to which they are effective needs to be studied more as they appear to vary depending on the targeted group, the form of media, with what variable they are studied in relation to (such as point-of-reference framing), and the type of climate action measured. There is more research done on the effect of message framing on people directly affected by climate change (flood risk communication, earthquake mitigation, et cetera) than on people indirectly affected. There is insufficient research on people indirectly affected by climate change (those who hear about it on the news or see campaigns about it) or specifically fear appeals. Our research has generally reached the same conclusion as existing wider literature on the effects of fear appeals in the media on motivating climate action.

Discussion

The literature reviewed reveals that, in general, loss frames, including fear appeals, are effective in motivating climate action. However, the extent to which they are effective depends on the target audience. If fear appeals were to be used more, they should focus on targeting people with preventative focuses and highlight the individual benefits of engaging in climate action. Importantly, there should be specific solutions presented alongside fear appeals. Nonetheless, there is insufficient research to reach a consensus on the effectiveness of fear appeals in the context of climate action. There is a significant gap in the research on climate messaging,

and each review paper seemed to focus on a different aspect of loss framing. It is important that more research is conducted on what messages are effective in motivating pro-environmental behavior because climate change will only affect the world more in the future. There should be a curriculum implemented to teach the population the definition of anthropogenic climate change and the knowledge they need to adapt and mitigate its effects.

Conclusion

This literary review paper explored whether loss framing media is effective in motivating people not directly affected by climate change to take action and whether there are other factors that contribute to the effectiveness of climate media. One main finding was that loss framing is effective in motivating pro-environmental behavior on its own. Another major finding was that loss framings are effective when paired with specific solutions to take climate action. Other findings include the following: the effectiveness of loss framing varies with individual variables, and the focus of the media and motivational framing is more effective than loss framing. Overall, there is insufficient research to reach a consensus on the effectiveness of loss framing, specifically fear appeal, in promoting climate action.

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