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Communicating the Health Impacts of Climate Change: from Conviction to Persuasion

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COMMUNICATING THE HEALTH IMPACTS OF CLIMATE CHANGE:
FROM CONVICTION TO PERSUASION

By
Emma M. Lozon

A THESIS

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

In Rhetoric, Theory and Culture

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Preface

This thesis is followed by practical recommendations for persuasively framing climate change in terms of health. The recommendations synthesize findings from this study and from other cited research in rhetorical and communication theory. This application, located in Appendix A, is intended for climate-change communicators and health communicators seeking to provide the public with a meaningful frame of reference for understanding climate change.

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Abstract

Drawing on rhetorical theory as well as research in health and environmental communication, this thesis analyzes the effectiveness of messages that link climate change with health implications at moving audiences to persuasion. The two texts analyzed are a report produced by a group of physicians advocating for action on climate change and an episode from the *Years of Living Dangerously* Series. The findings indicate that communicators have the opportunity to frame climate-change-health messages in rhetorically sensitive ways that are more likely to empower audiences. Progressing from problems to solutions and to benefits of taking action can frame distressing health messages more positively and productively. Mindful orientations toward audiences that respect their agency and their self-efficacy appear to offer an avenue for internalized understanding of the stakes of climate change.

Introduction

In the last decade, health experts have become increasingly aware of the health impacts—direct and indirect, future and present—associated with climate change (Romm 104). These impacts include, but are not limited to, rising rates of stroke, cancer, mental health disorders, weather- and heat-related deaths as well as increased incidence of cardiovascular, neurological, airway, foodborne, waterborne, and vectorborne diseases (Portier et al. 624; Smith et al. 713). While the importance of disease prevention and mitigation is widely accepted by the public, the systemic cause of these health issues—anthropogenic climate change—remains controversial. A 2016 Pew Research Center study found that only 48% of Americans agree that humans are causing the Earth to warm despite the overwhelming consensus among climate scientists (Funk and Kennedy 19; Cook et al. 3). A more recent study in 2017 found that while 58% of Americans believe that climate change is human-caused, only 13% are aware of the consensus among climate scientists (Leiserowitz et al. 7). The misalignment of public and expert beliefs has contributed to the stalling of climate-change mitigation.

One reason behind the failure of science communication is that facts do not speak for themselves. As George Lakoff asserts, “facts, to be communicated, must be framed properly” (73). Frames prioritize some aspects of the issue over others in order to make communication more effective; the efficacy of those frames, however, depends on the dispositions of the audience. Ideal frames unite different audiences around a shared problem and provide a sense of what, at a personal or community level, can be done to prevent or mitigate the problem. As alternatives to frames that further polarize the audience, Matthew Nisbet suggests stressing the economic, moral, and health implications of climate change (22). For the latter, emphasizing the public-health impacts of climate change has “emerged as a potentially powerful interpretive resource for experts and advocates” by localizing and personalizing an element of the issue that resonates with the public since health issues are generally already of significance (Nisbet 22).

Emphasizing health implications can help to depoliticize climate change. Katherine Burke et al. assert that health is “an essential frame for comprehending the stakes in climate change and for encouraging Americans to grasp that it is within their power to advocate, collaborate and take actions that will protect their own health and that of their families, neighbors and communities” (16). The public may not be able to agree yet on anthropogenic climate change, but the majority can support actions that improve quality of life for themselves and people they know. To mobilize the public to mitigate climate change, communicators can employ the health frame, in conjunction with other appeals, to communicate the present and future risks associated with a warming planet.

Health professionals can contribute to the climate change conversation in several important ways. It should be noted that health framing is not merely concerned with adapting to the effects of climate change, but can be a part of climate change mitigation as well. A public-health approach offers three tiers of illness-prevention: while secondary

and tertiary illness-prevention (practices concerned with lessening the impact of existing medical afflictions) correspond to climate adaptation, primary illness-prevention is concerned with efforts to avoid afflictions before their occurrence. The latter offers a model for avoiding global warming. Public-health preparedness is practiced even if there are scientific uncertainties about exact impacts (Frumkin et al. 437). In other words, precautions are taken even when health is threatened in ways that are not fully understood.

One area of mitigation where the health sector can contribute is through more widespread dietary recommendations (Frumkin et al. 435). If all patients were told by health professionals to follow the Harvard Medical School's "healthy diet," for instance, there could be significant reductions in greenhouse gas emissions. If implemented worldwide, overall emissions could be reduced by around 10%, and mitigation costs of keeping warming below 2°C since pre-industrial times by 2050 could be decreased by 50% compared to the business-as-usual scenario (Stehfest 96). There are multiple incentives for making dietary changes: for the health of the individual and for the health of the environment. There are also economic and ethical incentives for these dietary changes. Health professionals are in a unique position to expedite the "broad societal realization that [meat-heavy diets are] harmful to both the individual and society" (Romm 248).

Furthermore, medical professionals can weigh in on the health repercussions or benefits associated with other sectors, providing scientific support for policy-making. For instance with regard to the transportation sector, health experts can lend their public credibility to help "convey the necessity of moving away from fossil fuels for the sake of healthy communities, a healthy planet and the well-being of future generations" (Burke et al. 13). Greenhouse-gas emissions can be framed more accurately by taking into account social costs. Burke et al. suggest the need to recalculate fossil fuel prices to account for present and future health impacts (15). The healthcare sector has used the metric of disability-adjusted life-years to calculate environmental costs in terms of human life expectancy (Eckelman and Sherman 4). Similar measurements that put a human face on climate-change impacts could be adopted in other sectors to offer a more transparent view of the true expenses associated with certain practices and systems. This way of framing can lead to positive consequences: "quantifying those health and climate gains more accurately can help make the case for change" (Burke et al. 15).

Health professionals have begun to recognize the ways in which they are uniquely positioned to improve public understandings of climate change. In 2016, Dr. Howard Koh published an article in the *Journal of American Medicine* calling physicians to action on climate change, asserting that "clinicians have a powerful and unique opportunity to engage the nation by framing the crisis as a health imperative. Doing so can educate and empower patients, policy makers, and the public" (Koh). However, the extent to which doctors are communicating the health impacts of climate change to their patients on an individual basis is unknown. Doctors' willingness to discuss climate change with those under their care may be influenced by several factors including time limits imposed by a

clinical setting, personal political leanings, perceived irrelevance of the topic, and fear of attacks from lobbyists.

The demonization of doctors who speak out about climate change by powerful lobbies, akin to past and present treatment of concerned scientists, is a valid concern for which there are no easy answers. The opportunity to communicate to the public on a local level may help to protect against this problem. *The Physician Action Guide* from the Center for Climate Change and Health suggests that physicians can, among other strategies, “place climate-change educational materials” in their offices and “speak on the health impacts of climate change, and strategies to address them, at [their] local churches, clubs, or community meetings” (1). These actions communicate to the public in important ways about the health impacts of climate change, but do so within settings where there is less risk of their messages being politicized.

Despite the recognition by health experts that climate change is causing serious health harms, it appears that the American press and the public have yet to adequately apprehend the connection between climate change and health. According to a report on 2016 climate-change coverage by five major broadcast networks, there were only two segments, both on NBC, concerning the health impacts associated with climate change (Kalhoefer). ABC, CBS, FOX, and PBS did not report on this issue. In 2017, there were four corporate broadcast segments (CBS, NBC, FOX, ABC) on public-health impacts of climate change while the vast majority of coverage focused on the Trump administration’s actions (or inactions) regarding global warming (*How Broadcast TV Networks* 4). Burke et al. indicate that while “health emergencies that are linked directly or indirectly to climate” are covered with high frequency in the news, the connection to climate change is rarely made (3). Analysis of 2017 broadcast news coverage is consistent with this observation, finding only four segments across ABC, CBS, NBC, and FOX that connected climate change to extreme weather despite the immense health and economic tolls taken by hurricanes and other extreme weather in 2017 (*How Broadcast TV Networks* 9). Regarding public perceptions of climate-change-health impacts, Edward Maibach et al. found that Americans are generally not aware of health risks associated with climate change (“Do Americans Understand” 405). The public has concentrated more “on environmental and ecological aspects of climate change and technological questions than on human and health implications” (Burke et al. 4).

Related to this perception of climate change as an environmental issue, many Americans do not believe that global warming will harm them personally despite research findings that climate change presently threatens all Americans (*Climate Impacts on Human Health*; Sarfaty et al. 2). According to an extensive, 2016 survey, only 40% of people in the United States believe that climate change will impact them personally (Howe et al). Like belief in anthropogenic global warming, the extent to which climate change is apprehended as a universally impactful issue may have dropped due to the disinformation campaign led by conservative thinktanks and companies that benefit from practices that harm the environment (Brown 101). It follows that gaps exist between expert and public understanding with regard to the knowledge that humans are causing

climate change, that climate change is causing harm to human health, and that everyone is vulnerable to these negative impacts.

Research suggests that the health frame stands out for its persuasive potential on the climate change issue. Maibach et al. found that framing climate change as a public-health issue resulted in a positive response, suggesting that it “provides many Americans with a useful and engaging new frame of reference and that this new interpretation may broaden the personal significance and relevance of the issue” (“Reframing climate change” 9). Teresa Myers et al. found that framing climate change with regard to health was more likely to produce feelings of hope and less likely to produce feelings of anger than environmental and national security frames (1109). While research suggests the potential for the health frame to aid in the persuasion of audiences on the issue of climate change, none have examined existing health communications for their rhetorical efficacy.

The following study sets out to analyze how the health impacts of climate change are being communicated to public audiences in the United States. This rhetorical analysis offers preliminary insight into the extent to which messages connecting climate change and health are able to move audiences from conviction to persuasion. The distinction between conviction and persuasion is historically contested, but here the terms are understood in accordance with Augustine’s claim that persuasion is requisite for audiences to be moved to action (*On Christian Doctrine*, IV.xii.27). Instruction is a necessary but not a sufficient condition for persuasion. Daniel O’Keefe explicates the conviction-persuasion distinction in terms of communicative ends as the “effects on attitudes and effects on behavior” (32). While attitudes and behavior clearly overlap, it is useful to think of conviction and persuasion as distinct in the context of climate change communication since it’s often the case that audiences may be convinced that global warming is an issue, but not persuaded to act. The communicative end for climate-change communication is not simply to engage audiences, but to move them to action.

Literature Review

Diverse perspectives have contributed to understanding how to effectively construct environmental messages. Part of the communicative difficulty is in the failure to frame the environment as the cradle of human life. The conceptualization of the environment, according to Phillip Eubanks, is dispossessed of human agency, precluding a view of climate change as a human problem (127). To frame environmental messages like climate change, Lakoff recommends communicating in accessible language, providing narratives rather than “laundry lists” of uninterpreted facts, and appealing to values, emotions, and shared concerns (79). For example, a laundry list on the climate-change-health issue might consist of an enumeration of specific health issues associated with climate change, from diseases and heat deaths to mental illnesses and respiratory problems.

Lakoff also suggests that to communicate new environmental messages, the credibility of the messenger is important (72). The perception of the messenger corresponds to the Aristotelian consideration of ethos, or the “personal character of the speaker” (I.II). Aristotle indicates that the rhetor’s character is one of the foremost “means of persuasion” (I.II). The efficacy of the health frame derives in part from the authority embedded in medical ethos. For instance, on matters of health (including its intersection with climate change) doctors’ persuasive means are strengthened by public perception of their trustworthiness, their expertise, and their concern for public good. Relating to ethos, logos refers to “proof, or apparent proof, provided by the words of the speech itself” (Aristotle I.II). The appeal to logic, especially in medical and scientific contexts, might take the form of citing facts, statistics, and evidence. For example, quantifying climate-change-health harms can participate in persuading audiences that they should be personally concerned about the gravity of environmental threats.

A public health approach to climate change offers useful concepts for communication (Frumkin et al. 345). The importance of communicating health information for the purpose of empowerment is widely recognized. Effective communication will pair distressing information about health risks with solutions. Howard Frumkin et al. recognize the potentially counterproductive consequences of fear-based messages in engendering despondency. Hence, they suggest that communicators be careful to craft messages that “lead instead to constructive behaviors” (Frumkin et al. 439). To avoid triggering fatalism or despair, communication should aim to enable the public with health information and resources. Moreover, health communication need not be framed only in negative terms of fear and sacrifice; rather, it can affirm the health-related benefits of mitigation and adaptation. Carbon-emission-reduction efforts can reap health co-benefits, such as superior air quality as a consequence of employing alternative-energy sources (Luber et al. 231).

In a study on climate-change-health communication, Maibach et al. presented an essay to participants with the following four components that demonstrate a crucial emotive aspect of what constitutes an effective use of the health frame:

- an opening paragraph that introduced the public health frame (5 total sentences)
- a paragraph that emphasized how human health will be harmed if action is not taken to stop, limit, and/or protect against global warming (i.e., a description of the threat; 7 sentences)
- a paragraph that discussed several mitigation focused policy actions and their human health-related benefits if adopted (4 sentences)
- and a brief concluding paragraph intended to reinforce the public health frame (2 sentences) (4).

By addressing co-benefits of taking action, Maibach et al. shift their emphasis from the problem to the solution, to policy options and the benefits of taking action on climate change. If implemented with rhetorical sensitivity, a health frame “offers a vision of a better, healthier future—not just a vision of environmental disaster averted” (“Reframing climate change” 10). Pairing distressing information with solutions can be a part of what Aristotle refers to as pathos, where “persuasion may come through the hearers, when the speech stirs their emotions” (I.II). An emotional appeal is an example of constraints that are immanent to the rhetor, which influence the uptake of a message (Bitzer 8).

Combining ethos, pathos, and logos into a climate-change message is one example of orchestration of appeals, as conceptualized by Craig Waddell. Waddell suggests that “the juxtaposition (or orchestration) of motives...may be one of the best ways in which to appeal” to audiences with differing commitments and levels of expertise (“Perils of a Modern Cassandra” 229). These juxtapositions or combinations can include not only rhetorical strategies, but also appeals to moral imperatives, shared values, and other commitments. For example, recommendations for a plant-based diet can be strengthened by appealing to health, environmental, economic, and ethical considerations.

As far as the primary audience for climate-change-health communication, Lloyd Bitzer’s insight that the rhetorical audience is exclusively those who “are capable of being influenced by discourse and of being mediators of change” can help determine how to tailor messages to the appropriate listeners (8). It can be tempting to assume that the appropriate audience for climate change communication is composed of the most vehement climate-change deniers who may go as far as to purposefully deceive others. However, Aristotle’s assertion that “there are people whom one cannot instruct” applies in this case to those who maintain unreasonable skepticism despite being presented with overwhelming evidence from experts (Aristotle I.I). Rather than those who are ideologically positioned to reject the reality of climate change, the more relevant audience for climate-change-communication, those with the most potential to become agents of change, are those who are receptive to the issue. The “audiences most convinced by an argument are, if not the already persuaded, the already persuadable” (Eubanks 124). This group includes those who have not yet made up their minds and those who believe that the climate is changing due to human influence, but whose actions are incommensurate to their beliefs. Because health is more of a bipartisan issue than the

environment, the rhetorical audience for climate-change communication framed through the lens of health may be wider. Frumkin et al. address the importance of audience analysis in saying that climate-change-health communication should be modified appropriately according to differences in culture, preexisting knowledge, and susceptibility, among other differences. These factors along with audience values, beliefs, and commitments are examples of constraints in a rhetorical situation that are outside of the rhetor (Bitzer 8).

Additional considerations for climate-change messages include context and visuals. Lakoff indicates that framing should assist audiences in visualizing and contextualizing an environmental issue (80). Localizing climate impacts is a powerful rhetorical strategy for communicating climate change as long as it does not lead to a diminished sense of the scale of the issue (Corner et al. 5). Other research-based recommendations for persuasive visual communication of climate change include showing “real” people, telling new stories, and showing climate causes at scale (Corner et al. 5). Visual evidence can powerfully appeal to logic, credibility, and emotion. For instance, relying on “real” people instead of actors offers an organic, rather than manufactured sense of conveying information, which helps to create a compelling ethos. Rhetorical appeals likewise influence visualizations of climate change. For example, a new, emotional, relatable story may leave a deeper, more memorable impression, perhaps “remak[ing] the visual representation of climate change in the public mind” (Corner et al. 5).

In short, the health frame for climate change reframes the environment as inherently connected to human flourishing (Lakoff 76). Within this bipartisan frame, a more diverse audience may be influenced by climate-change discourse. The public-health frame can be even more persuasive when orchestrated with other frames. Rhetorically sensitive messages can be crafted by attending to the three constituents of a rhetorical situation as theorized by Bitzer: the exigence, the audience, and the constraints (6). Climate change is a rhetorical exigence because it is an issue that can be altered by discourse. Like Bitzer’s example of air pollution, climate change “strongly invites the assistance of discourse producing public awareness, indignation, and action of the right kind” (7). Dangerous warming is not inevitable, but can be averted by actions that reduce greenhouse-gas emissions. The following study analyzes the extent to which climate-change-health messages serve as fitting responses to the rhetorical situation. To modify the exigence posed by a changing climate, discourse must move audiences from conviction to persuasion.

Methodology

Much of the previous research on climate-change-health framing has taken a social scientific approach. Those findings give insight into the audience and constraints governing the rhetorical situation for climate change communicators. This study assesses the topic from a different perspective, that of rhetoric. Bitzer articulates that “rhetoric as a discipline is justified philosophically insofar as it provides principles, concepts, and procedures by which we effect valuable changes in reality” (14). This claim is based on a conception of rhetoric as functional, as holding purchase on the real. Changing reality is possible when audiences are moved through discourse to action. The transformational possibility of rhetoric justifies considering the rhetorical situation surrounding the urgent issue of climate change. While previous research on climate-change-health framing has implications for constructing rhetorically strategic messages, none have offered a comprehensive assessment of the persuasive potential afforded by this specific frame.

Previous rhetorical research has illuminated ways in which climate change deniers use argumentation to manipulate public understanding of the issue and to stall political action. Leah Ceccarelli unpacks Republican pollster Frank Luntz’s environmental memo to the White House in 2002 as participating in the manufacture of scientific controversy. Her analysis focuses on the rhetorical strategy invoked to capitalize on the public incognizance of the scientific consensus on anthropogenic global warming as well as “the commitment to dissonance in our institutions of journalism, law, and politics” (Ceccarelli 205). This commitment translates to equal coverage of a debate, regardless of whether one side has overwhelming support while the other has only a small minority of supporters. Social scientific findings with regard to framing climate change as a debate are consistent with this observation of false balance in the context of climate change (Antilla 350). Ceccarelli and Eubanks respectively find that responses to climate change skeptics have to mindfully negotiate argumentative situations to avoid unintentionally playing into skeptics’ arguments. These studies speak to the significance of rhetorical analyses and the ways in which they can supplement social scientific research. While Ceccarelli and Eubanks focus mostly on climate change denial, the following rhetorical analysis focuses on climate-change-health messages that stand out for their relative efficacy.

Drawing especially on Lakoff’s study of framing, Waddell’s rhetorical theory with regard to environmental communication, and Corner et al.’s findings regarding visual communication of climate change, this thesis investigates how persuasively climate-change-health impacts are being communicated. As some of the data involves textual, auditory, and visual formats, the approach takes into account the affordances and constraints of multimodality. The texts were chosen using purposive sampling, opting for messages that substantially advanced a climate-change-health frame. The research question guiding the analysis was the following: how persuasive are messages that connect climate change with health? The inquiry was concerned with the potential for messages not just to communicate, but to persuade audiences to become mediators of

change. The methodology involved close reading of texts and consideration of the effects of rhetorical choices as well as visual analysis.

One of the texts analyzed is “A Dangerous Future,” episode 8 of season 1 of *Years of Living Dangerously*, a Showtime documentary series on climate change, which won the 2014 Emmy Award for Outstanding Nonfiction Series. “A Dangerous Future” is the most substantial, mainstream communication explicitly using a health frame that I could locate. One of three storylines in the episode focuses on one especially pertinent aspect of the relationship between climate change and public health. The narrator, actor Matt Damon, investigates public-health impacts due to heat waves increasing in magnitude and frequency as a result of climate change. This segment is juxtaposed with another that addresses the relationship between climate-change-induced water shortage and violence in the Middle East as well as a segment that focuses on rising sea levels in Bangladesh and the corresponding social costs. The latter two parts of “A Dangerous Future” connect to health concerns as well.

The other text analyzed is *Medical Alert! Climate Change Is Harming Our Health*, a report published in March 2017 by The Medical Society Consortium on Climate and Health whose mission is “to inform the public and policymakers about the harmful health effects of climate change on Americans, and about the immediate and long-term health benefits associated with decreasing greenhouse gas emissions (i.e., heat-trapping pollution) and other preventive and protective measures” (Sarfaty et al. 26). The report explains the specific ways that unmitigated climate change causes serious harm to human health and additionally offers four narratives from physicians who provide their personal perspective on specific climate-change-health impacts. The creation of The Medical Society Consortium on Climate and Health was one of the few instances of climate-change-health segments offered by corporate broadcasts in 2017 (*How Broadcast TV Networks* 14). Prepared by a group of physicians in collaboration with climate-change-communication theorists at George Mason University, *Medical Alert* heeds Dr. Koh’s call in *JAMA* for physicians to address the health impacts of climate change with their patients.

Discussion

1.1 Ethos

The texts appeal to credibility in intersecting ways. Both rely heavily on the expertise of medical professionals. *Medical Alert* clearly conveys authority as it was prepared by a group of physicians “in medical societies representing over half of the nation’s doctors” (i). Those societies represent wide-ranging medical specialties. The organization’s symbol, a caduceus, is made with leaves instead of wings. This symbol, inscribed with credibility, is adapted to the new context of climate change, effectively representing the intersection of ecocentric and homocentric concerns. The symbol cogently encapsulates how physicians lend their credibility to the issue of climate change.

“A Dangerous Future” features two celebrities, Matt Damon and Michael Hall as well as Thomas Friedman, a high-profile journalist. These narrators are positioned as non-experts who speak with several epidemiologists, physicians, and scientists. “A Dangerous Future” begins by referencing Michael Hall’s character on the popular television show, *Dexter*. Hall suggests that the set of *Dexter*, partly a physical place and partly a fictional place, is a temporary environment that is being eradicated: “This studio has been my home for a decade... now it’s all coming to an end” (0:21-30). This description serves as a nonliteral comparison to the ways in which livable environments are being destroyed by climate change—especially the homes of those in places like Bangladesh. Hall proceeds to comment that “inside the air conditioned, airbrushed world of Hollywood, climate change isn’t something that you have to think about too much unless you really want to. But I know I’m living in a bubble” (1:17-29). “A Dangerous Future” helps to break the bubble that separates Hollywood from the real world, celebrities from the public, and countries like Bangladesh from places like heartland United States that are relatively insulated from the effects of climate change.

Some may argue that employing celebrities—rather than, for example, relying exclusively on investigative journalists—to host “A Dangerous Future” decreases the credibility and relatability of the message. Saffron O’Neill et al. observed that images of celebrities that were excerpted from newspaper articles minimized the sense of importance that participants accorded to climate change (7). The medium may be one factor in this interpretation. Film or video can afford more of an opportunity to humanize celebrities, as seems to be the case with the *Years of Living Dangerously* series. Alison Anderson delves further into the complexities of celebrities as rhetors on environmental issues, indicating that the question of celebrity and climate change communication resists a binary answer (9).

In attempting to level celebrities with the public and with an uninformed audience, “A Dangerous Future” succeeds in making Damon and Hall seem like “ordinary” people. Visually, the former appears relatable by donning everyday attire, including a white t-shirt, glasses, a wedding band, and a baseball cap. His conversation with a low-income

mother whose pregnancy was affected by heat reveals a parallel with Damon's own experience of his child being born prematurely. This demonstrates that even celebrities are vulnerable to the effects of climate change. Moreover, Damon's perceptions of climate change resemble that of an ordinary person who has not made extensive connections between heat and health. He admits that he "hadn't given heat waves much thought" and that he was surprised to learn that climate change comes within the purview of the CDC (2:10-14). The effect of this narration is that Damon is learning alongside the audience, instead of preaching to them. These various rhetorical choices help to counteract the distance between celebrities and ordinary people. The effect of associating climate change and celebrities is that even the people who are theoretically among the most sheltered from climate change due to their wealth are revealed as both susceptible and concerned.

It's worth noting that, although the television series features more diverse individuals, the three narrators in "A Dangerous Future" are all white males. This representation more accurately depicts the population that is most culpable for contributing to climate change (given their access to the most privilege) and the group most likely to express denial toward the issue. Aaron McCright and Riley Dunlap found that among the American public, conservative white men are more likely to deny climate change (1171). It's possible that white male narrators may be most convincing for this particular group. While white male ethos offers the authority of normativity, the exclusive representation of the issue by white men may lead some to dismiss its importance. The pattern of the white male narrator is contrasted with Dr. Samantha Ahdoot and Dr. Claude Tellis in *Medical Alert*. Of the four featured physicians who communicate a narrative about climate change and health in the report, Ahdoot is the only woman. The qualification is that she is represented not just as a physician, but as a mother. Ahdoot along with Dr. Claude Tellis, a black American from Louisiana, help to convey a more diverse perspective, which contributes to the strength of the message. In "A Dangerous Future," Dr. Rupa Basu, likewise, is first introduced to the audience as a mother, rather than as a medical expert. Matt Damon and epidemiologist George Luber identify as fathers, but those identifications are secondary to their primary identities as individuals.

As the celebrity narrators attempt to relate to their audiences, the doctors in *Medical Alert* also close a perceptual gap separating them from their audiences, that of expert and layman. The individual doctors who offer their perspectives forego specialized terminology in order to prioritize audience understanding. For example, Dr. Nitin Damle states: "Those blacklegged ticks, the carriers of Lyme disease, thrive in warm, muggy weather. In my home state of Rhode Island, where winters have gotten warmer and shorter, these tiny, sesame seed-sized insects have more time to bite humans and spread Lyme disease" (Sarfaty et al. 11). His accessible language converses with audiences in an informative, but informal manner. The use of "words people can understand" departs from a potentially condescending dynamic associated with expert-to-layman communications that might otherwise flaunt expertise (Lakoff 80). For instance, Damle uses the term "muggy" instead of "humid," purposefully choosing a more casual diction.

The cause—abbreviated, milder winters due to climate change—and the effect—greater prevalence of Lyme disease—can be readily understood without any reliance on a scientific or medical background. The use of example (that Damle now sees 40-50 cases of tick-borne diseases every season as compared to 2-3 cases previously) and figurative language (comparing the size of ticks to sesame seeds) helps make an abstract phenomenon tangible and visualizable. These communicative choices leverage medical expertise without alienating audiences.

1.2 Family values

Another point of access for expertise is through an emotional appeal. As part of a particularly prominent theme of children in both messages, the texts likewise present experts discussing climate change with relation to their own children. In “A Dangerous Future”, epidemiologist and Associate Director for Climate Change at the CDC, George Luber conveys that he personally worries about the health impacts of climate change because he has children (3:30-3:44). This appeals to emotion and values associated with family. Furthermore, in discussing his fears associated with the world as interpreted through climate models, Luber makes the association between emotions and scientific projections. His personal, yet relatable interpretation gives meaning to data that might otherwise not speak for itself.

In *Medical Alert*, Dr. Samantha Ahdoot tells the story of her son collapsing due to heat at summer camp. She couples this personal narrative with statistics regarding rising rates of heat-related emergency room visits for young people. This use of narrative effectively orchestrates appeals by engaging ethos since Ahdoot is both a pediatrician and parent, logos through highlighting various facts, and pathos by conveying frightening experiences surrounding a child’s health. While Ahdoot does not reveal her own emotion in favor of an objective, analytic tone possibly in order to avoid being perceived as “a woman” rather than a doctor, the audience can imagine the emotional experience of a parent whose child suffers a health scare. While Dr. Rupa Basu, an EPA epidemiologist featured in “A Dangerous Future” does not speak to her personal fears about heat waves with regard to her children, her first appearance in the episode, as previously mentioned, is in attendance at a soccer game, cheering on one of her sons. This scene ties into one of the most evocative parts of “A Dangerous Future,” the story of a young football player who died from heat exposure.

The effect of heat on children is of particular emphasis in both texts. Under the section “Extreme Heat” in *Medical Alert*, the text “Children bear a greater burden of climate-associated heat impacts—and they have the most at stake as temperatures continue rising” is highlighted in large, italicized font (4). This instance of deliberative rhetoric (the branch of rhetoric “concerned with the future” and with persuasion for or against a particular action) is made particularly resonant through the concern expressed for children (Aristotle I.III). “A Dangerous Future” ends on the health burden that children bear on account of heat by closing with the narrative of the football player, with his father stating, “the lesson that we need to know [is] that heat will take it away from

you” (56:54-59). This emphasis communicates the issue “at the level of values” rather than through politically polarizing policies (Lakoff 79).

The pain and stress inflicted by climate change on the parent-child relationship appears in several other contexts as well. In Yemen, Thomas Friedman speaks with leaders of two rural villages fighting over the scarcity of water due to climate change. One of the leaders of Qaradh talks about losing his son to the resulting violence, expressing “I feel pain that’s never been written in books. I don’t wish this on anyone” (39:30-37). This mirrors the sentiment expressed by the father of the football player that parents should never have to bury their children (56:41-44). The stories of parents losing children to climate-change impacts represent the most extreme manifestation of family-centered, deliberative rhetoric that argues for climate-change mitigation.

Medical Alert and the segment of “A Dangerous Future” narrated by Matt Damon appear to purposefully privilege children’s susceptibility over that of other populations such as poor people and minorities. In addition to the footage dedicated to the football player’s story, another substantial scene takes place in a clinic that serves children and pregnant mothers. In *Medical Alert*, children are named early on in the lists of those most vulnerable to certain impacts. For example, in explaining who is harmed by food contamination, the report indicates that “anyone can be harmed by contaminated food, but infants, young children, pregnant women, the elderly, the poor, agricultural workers, and those with weakened immune systems are more susceptible” (13). The placement has the effect of drawing attention to the various ways in which children will especially suffer due to climate change.

Visually, children are featured throughout both texts, but the representation differs. The first scene in “A Dangerous Future” that is narrated by Thomas Friedman begins with footage of children bowing in prayer (4:20). That same storyline concludes on images of children gathering water in drought-stricken Yemen with Friedman articulating concern over the particularly horrifying prospect of violence that stems from a “fight for survival” (51:03-17). *Medical Alert* begins and ends with images of children, the first image demonstrating how children will suffer the health impacts of climate change and the last image, how children’s health and well-being can flourish if concerted action is taken to reduce climate change.

Several other images in these texts show children in distressing situations. To embody the impacts of extreme weather, “A Dangerous Future” shows an image of a woman and child covering their mouths with a background that consists of rubble created by a severe cyclone. To likewise demonstrate the impacts of extreme weather disasters, *Medical Alert* shows a child being lifted to safety from a flooded area by U.S. National Guard members. While “A Dangerous Future” seems to focus on showcasing horrific impacts, *Medical Alert* presents images of children being assisted in problematic situations. As another example, the report shows an image of an infant being treated with an inhaler to illustrate the impacts of air pollution on health. This visual presentation may be more empowering to audiences because its depiction of hopefulness as opposed to

hopelessness reinforces the understanding that actions can be taken to mitigate the impacts of climate change.

In describing emotional appeals, Aristotle's conceptualization of happiness includes "wealth, good children, plenty of children, a happy old age, also such bodily excellences as health" (I.V). By appealing to multiple, primary determinants of happiness—including children and health—which are at stake with climate change, *Medical Alert* and "A Dangerous Future" persuasively engage the emotions of their audiences. Anthony Leiserowitz et al. found that the foremost reason that people are motivated to counteract climate change is to improve "life for [their] children and grandchildren" (24). This suggests that appeals to children's wellbeing in the context of climate change can be especially persuasive at spurring audiences to become mediators of change. From a rhetorical standpoint, the ubiquitous theme of children in these two messages constitutes an effective strategy for resonating with audiences on a personal, meaningful level. However, not all appeals to children's health and wellbeing are equally effective. "A Dangerous Future", in powerfully engaging emotions regarding children but without providing a course of action for changing the painful realities, may leave audiences feeling despondent.

1.3 Hope and efficacy

Medical Alert and "A Dangerous Future" diverge considerably in the sense of hope that they convey. *Medical Alert* adopts the format of the essay used in the study conducted by Maibach et al., which produced a positive response among readers. The health frame is introduced as the lens through which people should think about the stakes of climate change, conveying that global warming is an immediate threat to Americans. The body of the report explains the ways in which unmitigated climate change causes serious harm to human health. The conclusion offers policy solutions and co-benefits, highlighting the considerable reward for taking action. Overall, the document offers an example of positive emphasis regarding the subject of health and climate change.

The conclusion of *Medical Alert* focuses, not on the bleak reality, but on what can be gained from taking immediate action. The success story of Northeastern states collaborating to limit carbon dioxide emissions from power plants offers a specific example of how energy policy changes can produce beneficial results with regard to health and economics. The authors include persuasive data regarding illness and fatality prevention as well as the corresponding health cost savings of over five billion dollars. The clincher simplifies and depoliticizes climate change policy: "this is what US doctors want: fewer people going to hospitals, fewer people missing work..." (Sarfaty et al. 22). Regardless of ideology, everyone is likely support such health dividends. This presentation of information, progressing from problems to solutions, is more likely to resonate meaningfully with audiences. Leiserowitz et al. found that Americans have very little confidence that humans will counteract global warming (14). Given the prevalence of pessimism, messages that increase an audience's sense of self-efficacy are increasingly important for the purposes of empowerment.

The imagery that accompanies the call to action depicts sources of renewable energy and forms of transportation that decrease carbon emissions. Electric cars and public transportation in this new context articulate the relationship between the energy and health sectors. O'Neill et al. found that images depicting alternative energy futures empowered participants with confidence in their ability to do something about climate change (7). Images that appear in this collage in *Medical Alert* include some of the specific examples of images rated as most empowering by participants in that particular study such as wind energy, solar power, and electric cars (7). Images of smiling people bicycling, an environmentally friendly mode of transportation that increases physical activity, especially capture the way in which health and the environment can be simultaneously promoted. The visuals in this section are bright and hopeful. Unlike in previous images (such as a visual introducing the climate-change-induced health harms that shows a blinding sun blurring out human figures with a backdrop of yellow sky that appears stiflingly hot), the shining sun does not embody the threat of global warming, but rather coexists with a healthy, happier future (3). The environment, unlike in previous images of flooding and wildfire, appears nonthreatening.

The final image in *Medical Alert* of a physician holding a stethoscope to listen to a smiling child's heart conveys hope. Visually, this represents how prevention and action offer possibilities for a brighter future for all, but especially those most vulnerable to the effects of climate change. This image is in stark contrast to the visuals of children in concerning situations included in earlier parts of *Medical Alert*. Engaging Althusser's notion of individuals being hailed as subjects, this positive emphasis interpellates the audience as those who will rise up to the challenge and take action to realize a healthier future (Althusser 174). This is the work of good rhetoric, which, according to Waddell, "provides us with a better vision of ourselves and suggests ways in which we might more closely approximate that vision" ("Perils of a Modern Cassandra" 232). The images literally offer a vision that can be actualized through recommended actions regarding energy choices.

"A Dangerous Future," by placing the grieving family of the football player at the forefront of viewers' minds, ends with a disheartening view of the health impacts of climate change. The somber father reiterates the problem of heat, conveying that "the weather is changing. I mean it's getting hotter, it's definitely getting hotter" (56:48-53). The episode does not connect problems to solutions, which presents a missed opportunity for engaging viewers in understanding that the negative impacts of climate change can be lessened. The pathos-driven conclusion may leave viewers with an unproductive sense of hopelessness.

The intersecting storyline on Bangladesh does offer some hope. Hall expresses his wonder at Shahidul, a young man who survived the infamous Rana Plaza factory collapse and is learning computer skills to regain his agency as he rehabilitates from severe injury. The connection between climate change and health issues suffered by migrants like Shahidul is that climate migration leads to the acceptance of inhumane working conditions as they are sometimes the only option. Shahidul's miraculous recovery

suggests resilience and hope and at the same time, it humanizes migrants. This sense of hope, however, is complicated with indication that the problem continues to be perpetuated. For instance, Shahidul says that his eleven-year-old brother is likely to soon follow him into the city to find work (54:08-19). The final scene of this segment is of Shahidul on an airplane for the first time, smiling as he peers out the window. Despite his smiling, it seems unlikely that viewers will feel hopeful. If audiences are to feel empowerment, it's likely motivated by a sense of guilt.

Savvy climate-change-health messages should be able to stand on their own in empowering audiences to action. This requires an awareness of the nature of the emotional impact of messaging. Adam Corner et al. found that climate-impact imagery can appeal intensely to emotions and recommend pairing such images with “practical guidance on ‘actions’ that can be taken in response” (30). This recommendation seems useful beyond visual communication. With climate-change-health impacts, there is an opportunity to couple discussion of impacts with guidance regarding solutions and with insight into positive consequences associated with taking action.

1.4 Narratives

Michael Segal states that “without new narratives informed by science, we revert to old ones” like that of dystopia (126). Grand narratives of doom lead to public disconnect from the climate change issue (Segal 126). It follows that there is a need for more compelling stories that help audiences to conceptualize the stakes of climate change. Doctors can assist in creating new climate-change narratives that are informed by science, yet resonate more intuitively for audiences. These texts offer narratives that distill the human-health impact of changing climate.

Medical Alert includes four narratives that pair with informative sections on specific health-related impacts while “A Dangerous Future” focuses on the experiences of individuals who speak to larger trends in climate-change impacts. In *Medical Alert*, Dr. Claude Tellis conveys the health impacts of climate-change-related extreme weather by using narrative strategies. To relay the deadly flooding in Louisiana in 2016, he employs descriptive language, such as “refrigerators, washing machines and armchairs remained piled high on roadsides” and “it rained in sheets for days” (Sarfaty et al. 7). These images help audiences to visualize the experience of extreme weather. In communicating beliefs such as “our lives in Louisiana may never be the same,” Tellis’s perspective as a Baton Rouge native offers a personal connection to the place, the disaster, and the health impacts (7).

Lakoff recommends embedding facts, numbers, and main points in stories or narratives (80). The informative section about health impacts associated with extreme weather that precedes Tellis’s narrative contains only the facts: that extreme weather events are intensified by climate change, an enumeration of serious health harms caused by extreme weather, and a list of those who are most vulnerable (Sarfaty et al. 6). Tellis’s explanation of a “thousand-year flood” and its statistical rarity exemplify the

intensification of extreme-weather events due to climate change (7). Correspondingly, the recounting of people losing their medications and of disease-carrying mosquitoes proliferating in standing water gives context and a mental picture of the various ways that extreme weather harms health. Finally, the detail that “long after the storm passed, some teachers reported children who felt so anxious and afraid when it rained that they needed counseling” captures vividly how some populations are more vulnerable to the health impacts of extreme weather (7).

Grasping a microcosm of a macroscopic issue can foster understanding of the larger implications of a global issue like climate change. Narratives offer specificity and concreteness that can help audiences meaningfully grasp abstract, climate-change concepts. Segal asserts that “the goal of climate change coverage should be no less of a creation of intuition from fact” (123). For intuition to follow from fact, factual information must be framed such that it is more immediate and meaningful. “A Dangerous Future” demonstrates the power of narrative in making a previously unfamiliar phenomenon, the connections between heat and health, seem intuitive and nearly matter-of-fact.

While the story about the invisible consequences of heat ultimately centers around the football player who died due to exposure, the narrative is also one of scientists and medical experts engaging in the work of better understanding how climate change impacts health and what can be done about the issue. CDC experts are shown grappling with the difficulty of capturing and sustaining people’s attention when the disaster is not flashy and sensational. Dr. Rupa Basu is shown investigating a hypothesis that the death toll of a recent heat wave exceeded the number on record. To this end, “A Dangerous Future” includes her consultations with an emergency room physician and a coroner as well as footage of her working on a computer. This gives context to scientific understanding and to the credibility afforded to science. Having extensively observed the issue of heat and health from the perspectives of several experts as well as from the emotionally moving standpoints of those who have been personally affected by the heat, the connection to health appears logical and intuitive.

1.5 Orchestration of Appeals

Not relying exclusively on logical appeals in scientific and technical communication has been widely discussed. As Lakoff indicates, facts should be framed so that they appeal not just to logic, but to emotion (79). To frame climate-change facts, narratives can engage environmental, economic, moral, and health frames among other commitments. In defining orchestration of appeals, Waddell advocates for engaging a multiplicity of frames. For instance, ecocentric appeals should not be abandoned entirely in favor of homocentric appeals (“Saving the Great Lakes” 156). Part of the reasoning is that homocentric appeals can provide a point of access to ecocentric appeals (156). Moreover, since frames may imply different solutions to problems, layering appeals can expand conceptions of issues and the appropriate responses. For instance, orchestration can protect against assumptions that climate-change adaptation is the only solution,

which might result from exclusive reliance on a health frame. Orchestration of appeals was invoked in both “A Dangerous Future” and *Medical Alert*, strengthening the appeal to health concerns and the messages as a whole.

“A Dangerous Future” orchestrates a variety of appeals and offers the best example of engaging multiple commitments. The series consistently employs a format that interweaves multiple storylines. In this particular episode, as discussed previously, health impacts are juxtaposed with other major impacts of climate change. The audience is exposed to information about climate change as it relates to heat waves and health, to drought and violence, and to sea levels and climate migration. Distinctive visual transitions that crossfade between various locations reinforce the interconnectedness of climate-change impacts. The combination of appeals constitutes a more powerful way to rouse different audiences, since it may be persuasive to those most concerned with national security and to those especially concerned with health. Furthermore, the reliance on multiple frames leads to a more accurate sense of the complexities of climate change. While climate impacts might be neatly compartmentalized in some messages, “A Dangerous Future” conveys the inseparability of those impacts. While the storyline narrated by Damon specifically advances a health-frame, the other segments have connections to health as well. Drought in the Middle East and cyclones intensified by climate change in Bangladesh have multi-faceted health consequences. There are scenes in each of the three parts that take place in a hospital, which indicates how health is implicated in varied impacts.

Climate-change-related health concerns can easily be orchestrated with economic and social considerations since health issues clearly have financial and social consequences. Within the health segment in “A Dangerous Future,” an explicit example of orchestration of appeals is offered by one of the members of George Luber’s team, who tells Damon that “extreme heat waves in California are projected to have serious health impacts, social impacts, economic impacts” (3:00-06). This compact statement gestures to multiple commitments that might be held by audience members. Economic and social costs of climate change are referenced in *Medical Alert* as well. With regard to mental-health-impacts, the report conveys the relationship between mental health issues and the “physical, social, and economic stresses created by climate change” (Sarfaty et al. 14). These brief examples articulate the manifold ways in which audiences are affected by climate change, which offers multiple persuasive reasons for audiences to take notice.

Persuading audiences to adopt and support solutions can also benefit from orchestration of appeals. *Medical Alert* employs this rhetorical strategy in discussing solutions. With regard to the aforementioned health-success story of a cap-and-trade policy, the authors highlight the positive economic consequences associated with the initiative. They also cite a study that discusses health, environmental, and economic gains resulting from the policy. Orchestration of appeals is inherent to the concept of a co-benefit since the term refers to the additional benefits associated with mitigating environmental issues. It follows that emphasizing co-benefits, by providing hope as well as multiple incentives for taking action, can more persuasively make the case for change.

1.6 Localization and Personalization

At the same time that climate change is conveyed in its global complexity, it can be localized and personalized with regard to causes, impacts, and solutions. In both texts, climate-change impacts are localized through the focus on the narratives of affected individuals, yet the impacts are shown at a scale by giving context and providing data about the number of people who have been affected similarly. The human-health storyline in “A Dangerous Future” is mostly framed within the city of Los Angeles, with images portraying Southern California in various informative ways such as maps annotated with climate-change data and aerial shots of the drought. At the same time, this localized aspect of the episode is interwoven with events happening in other parts of the nation and around the globe. The scenes at the CDC and of the aftermath of the young football player’s death are filmed in Atlanta. The discussion of the number of people who are dying due to heat in the United States is followed by references to deadly heatwaves in Europe, India, and Russia. The health-focused segment of “A Dangerous Future” is in turn layered with the segments, filmed in other parts of the world, that likewise acknowledge local, national, and global impacts. It follows that this episode strikes a balance between the local and the global.

The term “glocal” has been invoked in the context of climate change to argue that global conceptualizations of the issue, and correspondingly, of solutions are insufficient (Gupta et al. 144). In addition to its global impact, climate change is experienced and caused locally, so it requires response on multiple levels (142). In “A Dangerous Future,” Thomas Friedman, in addressing connections between the Middle East and the United States, draws attention to the local and global relevance of the water shortage in Yemen. Friedman indicates that “there’s a big reason for Americans like me to care about what happens in Yemen, because this country is also home to the most active chapter of Al-Qaeda” (19:49-20:01). That Al-Qaeda is connected both to the local water crisis and to national security abroad offers a clear point of access for Americans’ engagement with an issue toward which they might otherwise feel desensitization.

While “A Dangerous Future” efficaciously addresses climate change as a glocal issue, *Medical Alert* purposefully centers on an intersection of national and local impacts. This scope is clarified by stating that “while these effects are experienced around the world,” the focus of the report is on climate change and its health impacts in the U.S. context (Sarfaty et al 3). To localize the issue for audiences, *Medical Alert* includes a map of the United States with symbols denoting the regions affected by climate-related health issues described in the report. For example, the northwest United States is marked with a fire symbol, a thermometer, and a distraught figure sitting in a chair, denoting that the area will be especially harmed by wildfire, rising temperatures, and mental health impacts. The graphic personalizes and localizes the issue by illustrating how people in specific regions are threatened by climate change while at the same time demonstrating why all Americans are at risk. The visual likely involves the audience by impelling them to find their particular location in order to view the specific impact of climate change on

their health. This audience participation may help to combat the common misperception that climate change will not be personally harmful.

To personalize impacts and solutions, *Medical Alert* stresses both that all Americans are at risk and that every individual can be a part of the effort to mitigate that risk. To this end, the takeaway that every American is vulnerable to the health impacts of climate change is repeated throughout the document. As for the call to action, the report outlines that everyone has the “opportunity to be part of the solution” (Sarfaty et al. 20). The authors specify the ways that individuals can take action with regard to transportation, energy, and diet. Comparatively, *Medical Alert* places much more emphasis on energy solutions than on diet and transportation. It’s possible that this angle was intentionally chosen in order to avoid alienating audiences. Corner et al. suggest that audiences may resist making connections between individual behaviors and climate change (25). Because energy solutions involve less sacrifice, they may be perceived as more palatable. However, the brief references to the benefits of plant-based diets and of minimizing automobile use are important because they may plant a seed for audiences that are moved to take action.

1.7 Visuals

Both texts include visuals that significantly increase audience engagement. Because people may not recognize that they have personally experienced climate change, texts that appeal to multiple senses may facilitate more concrete, visceral understanding of the issue. Moreover, if such texts are to be read voluntarily, multimodality seems like a crucial starting point for an effective climate-change-health message. To be persuaded, audiences will have to first open the text. This is a concern for *Medical Alert* because for all of its careful design, its colors intentionally chosen for effect, and its efficacious message, public audiences may not read it simply because of the fact that it is a report.

Assuming that audiences do open *Medical Alert*, one of the images offers particularly persuasive visual evidence. In the section summing up the health risks posed by climate change, there is an image of Wall Street in New York City after different degrees of warming. At two degrees of warming, tourists surround the imposing Charging Bull statue while at 4 degrees of warming, the bull, aside from its tail, is completely submerged by flooding. A well-known feature of New York City, the statue is symbol of financial prosperity. The submerged bull effectively symbolizes the financial devastation posed by climate change. This visual projection affords audiences a glimpse of a future resulting from a failure to proactively confront global warming.

An instance of persuasive visual evidence employed by “A Dangerous Future” concerns climate-change causes. Corner et al. recommend large-scale depictions of global warming causes due to their finding that participants dismissed images of individuals producing carbon emissions (25). Numerous shots of highway traffic in “A Dangerous Future” reinforce the connection between automobile emissions and the impacts of climate change. Furthermore, the amount of filming that takes place in vehicles is likely

an intentional choice. There are multiple conversations from within cars, airplanes, and helicopters. The juxtaposition of individuals contributing to greenhouse-gas emissions with the wide shots of heavy traffic provides a persuasive depiction of accountability.

Corner et al. also emphasize the importance of authenticity in visual communication of climate change (17). *Medical Alert* includes images of real people suffering the impacts of global warming. For instance, there are photos that were taken in the aftermath of Hurricane Sandy. One image displays two women crying in the wake of the hurricane with the corresponding caption stating that they had lost their homes. The genuine emotion of the two women is more likely to move audiences to empathy. Another image made during Hurricane Sandy shows a woman, brow furrowed, looking through canned and other packaged foods on a table as her daughter looks on next to her. The narrative created by the image involves the caption, “a woman shops for food in a shelter,” which introduces added complexity (Sarfaty et al. 15). That this phrasing “shops for food” is perceptually incommensurate with what is actually occurring in the photo supports audience engagement.

“A Dangerous Future” likewise includes footage of real people who have been impacted personally by climate change. This privileges the voices of people of other cultures and positionalities, allowing them to speak for themselves about their experiences of climate change. There are also still images included in some parts of “A Dangerous Future,” such as those recounting the damage inflicted by cyclones and the horrific collapse of the Rana Plaza factory. These authentic images, flashing on the screen in rapid succession, overwhelmingly appeal to sympathetic emotions.

Stereotypical climate change images like those of polar bears fail to engage participants in critical thinking about the issue; therefore, Corner et al. recommend imagery that contains new narratives about global warming (23). The face of climate change in these two texts is the least expected: young, healthy, privileged, white, male. A child playing football in the heat is a narrative that occurs in both texts, emphasized in “A Dangerous Future” by its placement at the end and featured prominently on the cover of *Medical Alert*. Football, a sport that is distinctively popular in the United States offers a means of connecting with the American public. The image on *Medical Alert* presents a child seated on his helmet, looking rundown with visibly sweat-drenched hair. In “A Dangerous Future,” the only images of the football player are photographs taken before his untimely death and other ephemera mourning his short life. The child athlete is an effective symbol demonstrating that no one is exempt from the negative repercussions of climate change.

1.8 Audience Construction

Building on Bitzer’s theory of the rhetorical situation, Waddell suggests that the “rhetor constructs not only the exigence, but also the audience” (“Perils of a Modern Cassandra” 225). The way that audiences are conceptualized significantly shapes messages and their efficacy. Segal asserts that audiences for science communication

“appreciate being given the credit of expecting that they will understand the hard stuff” (127). These texts construct audiences as reasonable people who might appreciate nuanced insight into the issue. *Medical Alert* includes language excerpted from a climate science report, which states that “we are at risk of pushing our climate system toward abrupt, unpredictable, and potentially irreversible changes with highly damaging impacts” (Sarfaty et al. 17). In addition to unpacking this information in understandable terms, the authors of *Medical Alert* offer a physician’s response to this scientific conclusion, signaling the serious health implications regarding both best- and worst-case scenarios. A conversation between George Luber and Matt Damon in “A Dangerous Future” invites viewers to consider the unique challenges of communicating climate change. Luber addresses constraints inherent to the rhetorical situation in asking “how do we get people to realize that this is a disaster unfolding? We don’t have dead bodies on the sidewalk... It’s a slow moving disaster” (3:43-56). With the inclusion of this dialogue, “A Dangerous Future” engages viewers in metacognition regarding the issue.

The texts not only conceive of an audience that is reasonable, but one that is compassionate. Waddell critiques Paul Ehrlich’s “focus on fear *of* rather than fear *for* the most oppressed peoples of the world” in the context of overpopulation (226). This “theme of compassion” absent from Erlich’s advocacy is established in both of these climate-change texts (Waddell 225). *Medical Alert* and “A Dangerous Future,” by bringing attention to the populations most vulnerable to climate change, convey the relationship between the environment and inequality, with the expectation that audiences are receptive to this information. For each specific climate-change-health impact, *Medical Alert* answers the question: “Who is being harmed?” The authors highlight how those who are already at a disadvantage due to poverty, disability or other marginalizing conditions are at greater risk for various climate-change impacts. Images from Hurricane Sandy, a disaster that was experienced very differently depending on socioeconomic status, also reinforce the connections drawn between positionality and climate-change-impacts. While straightforward and informative, the attention paid in this regard suggests care expressed toward marginalized groups. An ethos of care, consistent with the ideal praxis of physicians, in turn may propel an audience who already cares about vulnerable populations to action or may lead audiences from concerns for self to concerns for others.

The narrators in “A Dangerous Future” likewise draw attention to the correspondence between positionality and climate change in ways that may move audiences that are motivated by compassion. After learning about the relationship between heat and surface characteristics of land, Damon reflects that “it’s the poorest neighborhoods that tend to have the fewest trees which means they’ll be hit the hardest” (15:26-31). An aerial view of a neighborhood with blacktop and few trees depicts the understanding that vulnerability is related to material conditions. Across the globe, Hall articulates that “Bangladeshis have done almost nothing to cause global warming especially compared to an American like me. But it looks like they’ll have to pay a much steeper price” (27:50-28:05). Hall calls attention to his personal culpability in contributing to climate change and in turn to the climate-change-related impacts suffered by people who are not privileged. His statement allows audiences to reflect for

themselves on whether they are likewise at fault. Feelings of responsibility as well as those of compassion may motivate audiences toward action on climate change.

“A Dangerous Future” negotiates a dialogue on privilege without alienating audiences. The footage in drought-stricken Yemen shows people struggling to fulfill a basic need that many Americans take for granted. In Bangladesh, “a good living space” for climate migrants houses 10 to 15 people in a cramped space and those with tap water and an outhouse are “much more fortunate than most” (26:25-29; 26:54-58). The discussion of the deadly collapse of the Rana Plaza factory, which produced clothing for Western retailers, implies the connection between American consumerism and inhumane working conditions that climate migrants endure out of necessity. “A Dangerous Future” implicitly asks audiences to consider the ways in which others suffer the consequences of their privilege. At the same time, the fragility of that privilege is communicated. Friedman warns that Yemen “could be a glimpse into our future” (22:48-50). If not motivated by compassion and guilt, audiences may then be moved by self-interest. Climate-change-health messages present an opportunity to articulate that everyone is at risk, but that some are at greater risk than others, which can move audiences by way of a homocentric appeal.

Bitzer indicates that Aristotelian enthymemes—arguments with one withheld premise—derive their “self-persuasive” quality from audience participation in constructing the argument (“Aristotle’s Enthymeme Revisited” 408). In initiating further reflection and dialogue regarding privilege and positionality, the narrators of “A Dangerous Future” allow the audiences to complete the argument concerning climate-change culpability for themselves. Should the audience achieve the same conclusion with which Damon and Hall seem to grapple, the result is a greater likelihood of the audience being moved from conviction to persuasion. Enthymeme, while stemming from persuasive Aristotelian rhetoric, offers an opportunity for collaboration between rhetor and audience. Bitzer suggests that “because they are jointly produced, enthymemes intimately unite speaker and audience and provide the strongest possible proofs” (408). The power of enthymeme resides in its divergence from some of the salient characterizations of Aristotelian rhetoric as aggressive and paternalistic.

1.9 Offering Perspectives

Some of the criticisms of Aristotelian rhetoric—in particular, an implicit stance toward the environment that conflicts with ecocentric goals of communicating climate change—bear mentioning. Invitational rhetoric, an alternative proposed by Sonia Foss and Cindy Griffin, can provide a useful counterpoint to Aristotelian rhetoric in informing climate-change communication. This theory resists patriarchal assumptions of rhetoric as necessarily compelling audiences to take the view of the rhetor (Foss and Griffin 2). Invitational rhetors foster intimacy with rather than dominance over their audiences. The corresponding messages offer an “invitation to the audience to enter the rhetor’s world and to see it as the rhetor does” (4). Some aspects of feminist rhetoric—including the interpersonal dynamic governing the communicative situation and the commitment to

self-determination—may help audiences to better understand what is at stake with climate change by allowing them to come to their own conclusions. Corner et al. found that participants in their study did not want to be sold ideas about climate change (18). They did not resist the content so much as the packaging, which they compared to advertising. To avoid alienating audiences, climate-change-health messages can be offered as perspectives that initiate dialogue and reflection.

Medical Alert and “A Dangerous Future” are not prototypes of invitational rhetoric, but some of the approaches are more consistent with invitational rather than confrontational rhetoric. As discussed previously, the narrators of “A Dangerous Future” make nonadversarial observations about the relationship of privilege to climate change and engage in a process of discovery that puts them in a position to learn alongside the viewers. Matt Damon poses the question, “Is it possible the most dangerous thing about global warming is also the most obvious—the heat itself?” (4:02-11). Asking questions can be a part of an approach that maintains openness toward audiences (Foss and Griffin 6). With his question, Damon is allowing the audience to consider the issue for themselves, rather than imposing a particular viewpoint upon them. Furthermore, the episode privileges the voices of people of other cultures and positionalities, allowing them to speak for themselves about their experiences of climate change.

In aggressively persuasive rhetoric, “audience members are assumed to be naive and less expert than the rhetor” (Foss and Griffin 3). In *Medical Alert*, this assumption does not underlie the message. For instance, the authors do not shame the audience for failing to be aware of the seriousness and immediacy of global warming. Rather, they explain that “there has been relatively little public discussion of the health harms of climate change” (Sarfaty et al. i). As addressed previously, the four doctors offer their perspectives using accessible, non-condescending language. Like the celebrity narrators in “A Dangerous Future,” the doctors foster a connection with their audience. Rhetor and audience shift from a potentially patronizing doctor-patient relationship toward a more egalitarian dynamic. This orientation is significant because better doctor-patient relationships yield a greater likelihood of adherence to doctors’ advice (Vermeire et al. 337). Moreover, the goal for the document aligns with the invitational objective of “contribut[ing] to the understanding by all participants of the issue and of one another” (Foss and Griffin 6). The authors of *Medical Alert* invite the audience to see the climate-change issue as they do: “We—physicians in medical societies representing over half of the nation’s doctors—see a need to share our growing understanding and concern about the health consequences of climate change with all Americans” (Sarfaty et al. i). Their insight is compelling not because it advocates a privileged viewpoint, but because it provides information that may be personally meaningful to the audience.

Citing Gearhart, Foss and Griffin note that rhetoric as persuasion coincides with an appropriative, domineering stance toward the environment (2). Other scholars like Jason Moore have articulated the relationship between the nature-culture binary and other binaries such as race, gender, and class. An arbitrarily constructed continuum from nature to civilization asserts that certain lives are valuable and others are not. The “other” and

the environment are conflated as illegitimate life. Perspectives from invitational rhetoric can be consonant with environmental and social justice. From a medical standpoint, invitational perspectives coincide with “movement away from the paternalistic conception of the doctor-patient relationship, to a form of relationship where the patient’s autonomy and fundamental right to self-determination is acknowledged” (Vermeire et al. 337). The new medical paradigm calls into question the concept of patient compliance. As alternatives to compliance, concordance or adherence signify that patients hold agency in making decisions about their lifestyle and behaviors whereas the primary role of the doctor is to provide assistance in making those decisions (Vermeire et al. 333). Finally, movement toward invitational rhetoric can better align with a Social Constructionist Model of Public Participation, which allows for multi-directional exchange between experts and the public of information, beliefs, and values (“Saving the Great Lakes” 142). Foss and Griffin suggest that invitational rhetoric has intentional possibilities that yield space for marginalized perspectives that can enrich a view of a problem and its solutions (16).

Invitational rhetoric, however, can become problematic in the context of climate change since it allows people “rights to believe as they choose and to act in ways they believe are best for them” (Foss and Griffin 3). If those chosen actions are harmful to others, they should not be affirmed. Eubanks asserts that in cases like climate change where so much is at stake, it is more ethically problematic to withhold the available means of persuasion (120). From an ethical standpoint, the moral duty to avoid harming others is “triggered once there is a reasonable basis for concluding that one’s actions could be harmful to others, particularly in cases where waiting for uncertainties to be resolved could make the problem worse” (Brown 104). Since a commitment to “fairness and balance” can lead to dangerous prolonging of debate, invitational dialogue should be weary of giving a platform to climate-change deniers. While the limitations of invitational rhetoric preclude its categorical use, some of its fundamental principles can help inform climate-change messages that open dialogue and engage audiences as equals. If the goal of climate-change communication is to empower audiences as mediators of change, it seems crucial to respect their agency.

Conclusion

The main takeaway from this research is that communicators have the opportunity to frame climate-change-health messages in rhetorically sensitive ways that are more likely to empower audiences. Progressing from problems to solutions and to benefits of taking action can frame distressing messages more positively and productively. Mindful orientations toward audiences, that respect their agency and their self-efficacy, appear to offer an avenue for internalized understanding of the stakes of climate change. While Aristotelian rhetoric is certainly useful in the high-stakes situation of climate change, the invitational goal of “cooperative, nonadversarial, and ethical communication” is necessary for the co-creation of a world that is more environmentally and socially just (Foss and Griffin 15). Climate change communication may best thrive in a space between traditional and invitational rhetoric that supports empowerment rather than compliance.

This study quickly discovered blurred boundaries around the concept of a health frame. While some messages are explicitly labelled as human-health focused, many other messages have implicit, yet important connections to health impacts. For instance, national security and climate migration are inexorably connected to health issues. Moreover, health frames may not be perceived as such by audiences. Despite the fact that “A Dangerous Future” captures the human face of climate change by displaying climate migration, health impacts, and political violence, a comment on the Youtube webpage for the episode praises the environmental concerns expressed and stresses the necessity for high-profile individuals “to help save the planet” (Clark). While this is only one example, it suggests the pervasiveness of the environmental frame. Certain texts may be characterized as environmental or “green” by virtue of characteristics beyond their representations of climate change.

Furthermore, there are some limitations to the health-frame. While people typically agree that health is of importance, their behaviors may deviate from that belief. A lack of patient compliance is a consistent problem in the medical field (Vermeire et al. 331). People may respect and trust doctors, but that perception of credibility does not necessarily translate into adherence to doctors’ recommendations. Furthermore, there may be a perceived disconnect between long-term, global climate impacts and individual, daily behaviors. People may resist content that connects individual action like meat consumption to climate change (Corner et al. 25). The limitations associated with the health frame reinforce the importance of orchestrating health considerations with those of other commitments held by audiences.

Future research could examine the extent to which the health impacts of climate change are being communicated by health professionals and in the media. The scope of this research could extend beyond the United States to examine the global context for climate-change-health communication. The role of feminist rhetoric in climate-change communication could also be more clearly articulated. Most importantly, future research could examine the content, framing, and rhetorical strategies involved in climate-change messages that lead to sustained motivation for individual behavioral changes that mitigate

climate change (from adopting a plant-based diet to voting). As powerful organizations continue to perpetuate misinformation while the negative impacts of climate change on human life are increasingly felt, climate-change-communication research remains extremely urgent.

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A Recommendations for Communicating the Health Impacts of Climate Change

Leverage scientific and medical expertise with accessible language

Make communicative choices that privilege audience understanding and foster a more egalitarian connection between rhetor and audience.

Balance persuasion with perspective-offering

Draw on principles from invitational rhetoric in order to support audience sense of self-efficacy.

Engage rhetorically sensitive emotional appeals

Pair emotionally moving content with courses of action that can mitigate climate-change impacts. Emphasize co-benefits.

Orchestrate appeals

Engage a multiplicity of frames to strengthen the appeal to health concerns and to make a more persuasive case for supporting solutions.

Personalize and localize climate-change-health impacts and solutions

Strike a balance between local and global impacts. Engage audiences personally in efforts to mitigate climate-change.

Opt for Multimodality

Employ visuals that empower audiences with confidence in their ability to do something about climate change.

Bring awareness to privilege and positionality

Appeal to compassion and responsibility. Propel audiences from egocentric concerns to homocentric and ecocentric concerns.