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RECEIVED 01 February 2024

ACCEPTED 15 April 2024

PUBLISHED 03 May 2024

CITATION

Johnstone C and Stickles E (2024) Navigating the climate change minefield: the influence of metaphor on climate doomism. *Front. Commun.* 9:1380092. doi: 10.3389/fcomm.2024.1380092

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Navigating the climate change minefield: the influence of metaphor on climate doomism

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Climate doomism is an increasing concern for climate change communication. In the United States, this opinion regarding anthropogenic climate change is now more prevalent than climate skepticism, and is the primary reason cited for opposition to climate action. Doomism is the belief that catastrophic warming of the planet is now inevitable, and that effective mitigation is impossible. The behaviors resulting from this view are comparable to the result of climate skepticism: doomism produces paralyzing eco-anxiety and subsequently inaction. Prior work has hypothesized that the rise in climate doomism and eco-anxiety is linked to climate change risk communication. This study investigates the possibility that the metaphoric language used to communicate the severity and urgency of climate change could inadvertently promote doomism. We employ a survey model to test the influence of metaphoric language on perception of urgency, feasibility, and individual agency in relation to the climate crisis. American English-speaking participants ($N = 1,542$) read a paragraph describing climate change either as a “cliff edge” or “minefield,” with human agency manipulated to be present or absent. Responses were considered to be doomist if they reported a high sense of urgency, paired with a low sense of feasibility and/or agency; this indicates they have a high awareness of the risks associated with the climate crisis, but a low belief that it will be addressed, and/or that their actions can produce meaningful change. Use of either metaphor improved perceived feasibility without a reduction in urgency, indicating that metaphor is an effective climate communication strategy for conveying risk without promoting doomism. However, metaphoric presentation is only effective when paired with human agency, suggesting that agency is a necessary component for successful metaphoric climate communication strategies.

KEYWORDS

climate change, metaphor, doomism, eco-anxiety, agency, climate communication

1 Introduction

Over the last 20 years, the world has seen a dramatic increase in the frequency and intensity of extreme weather events. This has led the scientific community to issue increasingly dire warnings. In March 2023, the Intergovernmental Panel on Climate Change (IPCC) released the final installment of the AR6 Synthesis Report, the culmination of 5 years of research from 2018 to 2023. This report paints the clearest picture yet of the unprecedented scale of the challenges we are facing and issues a stark warning: “There is a rapidly closing window of opportunity to secure a livable and sustainable future for all” ([Intergovernmental](https://www.ipcc.ch/report/ar6/synthesis/)

Panel on Climate Change, 2023, p. 55). The AR6 demonstrates indisputably that the pace and scale of the mitigative actions we are currently taking are insufficient to guarantee this future. It warns that some impacts of global warming are likely already irreversible.

In the face of the increased visibility of climate change and the corresponding amplification of warnings from scientists, a discussion is emerging around the notion of climate doomism. The term is operationalized in a variety of ways across the existing literature, often appearing interchangeably with closely related terms such as eco-anxiety, climate grief, and solastalgia (see Coffey et al., 2021). An overview of the concept is offered by Mann (2021):

Exaggeration of the climate threat by purveyors of doom – we'll call them “doomists” – is unhelpful at best. Indeed, doomism today arguably poses a greater threat to climate action than outright denial. For if catastrophic warming of the planet were truly inevitable and there were no agency on our part on averting it, why should we do anything? Doomism potentially leads us down the same path of inaction as outright denial of the threat. (Mann, 2021, p.179)

We define doomism as the belief that catastrophic warming of the planet is now inevitable, and that there is no ameliorative action that can be taken to avert this. As Mann observes, the result of this view is essentially identical to the result of climate skepticism: doomism produces inaction. While the situation is evidently critical, research has disputed the notion that it is too late to avoid catastrophic climate change (Hulme, 2019; Shaftel, 2023).

However, research also indicates a growing disconnect between the potential for climate change mitigation and the public's conceptualization of the climate crisis. In recent years there has been a significant drop in the number individuals who describe themselves as ‘dismissive’ or ‘doubtful’ regarding the existence of global warming (Gustafson et al., 2019). This fall in skepticism has been accompanied by a rise in the number of individuals reporting doomist attitudes. This has been demonstrated by de Pinto et al. (2019), who found that more people opposed action because of doomist beliefs than opposed it due to skepticism; and Leiserowitz et al. (2018), who demonstrated that more respondents believed that humans cannot address global warming even if it is happening than denied its existence. This trend in the data demonstrates a shift in the root cause of opposition to mitigation efforts. While addressing skepticism remains of vital importance, this research indicates that doomism is now the greater source of reluctance to engage with mitigation efforts. As such, it requires attention as a potential barrier to climate action. In this study we question whether the language used by policymakers, activists, and journalists to describe the climate crisis could inadvertently promote climate doomism. We hypothesize that common metaphors employed by these communicators with the intention of addressing skepticism and promoting urgent action may be unintentionally contributing to feelings of hopelessness and despair.

Previous research has noted that both visual and linguistic metaphors are prevalently used to characterize climate change (Roosen et al., 2018; Augé, 2022; Dancygier, 2023). However, in this paper we choose to focus on linguistic metaphors. Linguistic metaphors deserve additional attention, as the complexity and scale of the processes involved in climate change mean that metaphors are almost inherent in the language used to communicate climate change

science to non-expert audiences. This is evidenced by the commonplace metaphors that are central to the laypersons' everyday language of climate change, such as ‘greenhouse gas’ and ‘carbon footprint’ (e.g., Nerlich and Hellsten, 2014).

A wealth of studies has empirically demonstrated a link between the metaphors used to present an issue, and the addressee's conceptualization of that issue. A metaphor typically comprises two key elements: a source domain, which is usually a concrete, or more intersubjective concept; and a target domain, which is the abstract or less intersubjective notion that the metaphor is intended to characterize (Dancygier and Sweetser, 2014). Elements of the source domain map onto the target domain, allowing us to reason about the abstract target domain by using the source domain as a framework. For example, the metaphor CLIMATE CHANGE IS A WAR¹ applies elements of the source domain of War – enemy combatants, weaponry, battle strategies, a winner and loser, and so forth – to the target domain of climate change. This metaphor is frequently used in the English news media, as illustrated by a 2020 *New York Times* article titled “A New Weapon Against Climate Change May Float” which posed the question, “How large a weapon in the battle against climate change could [the offshore wind] industry become?” (Reed, 2020). Here offshore wind farms are conceptualized as a “weapon” in a “battle” against climate change, implying that climate change is an enemy to be fought. Further implications are the severity of the outcome of the conflict (war is a life-or-death scenario) and the scale of the conflict (wars, as opposed other types of conflicts, are fought on a global stage). A survey-based experimental approach to assessing potential effects of the relationship between source and target domains was first demonstrated by Thibodeau and Boroditsky (2011). They examined the relationship between the metaphor used to describe a rise in crime in a fictional city, and the reader's view on the measures that should be taken to address this problem. They tested this by asking participants to read a short passage describing the city, in which crime was either characterized as a virus or as a beast. Their results indicated that the metaphor used had an effect on how readers proposed solving the city's crime problem: the participants' understanding of crime as a concept was, in part, structured by their understanding of a virus or a beast.

The power of metaphor to structure reasoning has been further demonstrated in relation to climate change by Flusberg et al. (2017), who compared the metaphors CLIMATE CHANGE IS A WAR and CLIMATE CHANGE IS A RACE. Following the methodology of Thibodeau and Boroditsky (2011), they were able to demonstrate that describing climate change as a war produces a greater sense of urgency, and a greater willingness to engage in individual behavior changes. Such behavior changes included paying a premium for products that offset carbon emissions and reducing the use of air conditioning and heating.

The central importance of metaphor in climate change communication has been widely acknowledged across a range of fields (e.g., Romaine, 1996; Shaw and Nerlich, 2015; van der Hel et al., 2018). These publications raise several specific concerns regarding existing metaphors for climate change. For instance, research has questioned

¹ Metaphors are stylized in capital letters in order to clarify that they are conceptual, distinct from words or expressions.

the appropriateness of metaphors that present climate change as a dichotomous choice between an impacted and a non-impacted world (Russill and Nyssa, 2009; Shaw and Nerlich, 2015; van der Hel et al., 2018). Metaphors that follow this pattern include the tipping point, crash barrier, guard rail, and threshold, as illustrated by these examples drawn from news sources (emphasis added):

- (1) World on brink of five ‘disastrous’ climate **tipping points**, study finds (Carrington, 2022)
- (2) The IPCC Fifth Assessment Report outlined the inconsistencies of the previously stated tourism emissions rising trend with the prerequisites to stay within the +2°C **crash barrier** (Anbar, 2022)
- (3) ...the scenarios described are stringent and likely to keep average temperatures either below the 1.5°C **guard rail** or overshoot it and then return below it by the end of the century (Rajan and Byravan, 2019)
- (4) Earth likely to cross critical climate **thresholds** even if emissions decline, Stanford study finds (Garthwaite, 2023)

Within this framing, climate change mitigation efforts are understood as an attempt to prevent the world from crossing the line into an ‘impacted’ state. Several issues are raised with this binary conceptualization of the climate crisis. Firstly, this understanding of climate change is not scientifically accurate. Rather than being a discrete danger point at which the world shifts into an impacted state, climate change is best understood as an ongoing process, with each fraction of a degree of warming associated with increased risks (Mann, 2021). Secondly, a clear issue with this dichotomous view is that for millions of people around the world, dangerous consequences of climate change have already arrived. We have already crossed the line and entered into the ‘impacted’ state in which human interaction with the climate has become dangerous. Dichotomous metaphors are not well-equipped to deal with this scenario, steering us towards policies of adaptation rather than mitigation. Thirdly, Shaw and Nerlich criticize the choices offered to us by dichotomous metaphors (2015). By their nature, these source domains place limits on our ability to conceptualize alternative futures, instead offering us a direct choice between the status quo, or something much worse. This choice is particularly restrictive when considering the perspective of Indigenous peoples, given that today’s status quo already represents a catastrophic loss of Indigenous ecologies. This is observed by Whyte (2020):

[It] is important to consider some of the differences in the narrative that Indigenous peoples might have. It is not a given that today’s social-ecological systems are ones that are important to conserve. For the state of these systems today is already, for some, an Indigenous dystopia. (Whyte, 2020, p.299)

When the climate crisis is represented as a binary choice between an impacted and non-impacted world, we are inherently assuming that our current climate represents a just and desirable scenario. This acts to obscure the experience of those for whom the status quo is already representative of the catastrophic ‘impacted’ state which we are purportedly seeking to avoid. While Whyte highlights this in relation to Indigenous ecologies specifically, this speaks to a wider pattern, in which existing power structures that have historically oppressed and excluded marginalized groups are

upheld and reinforced, under the guise of maintaining a purportedly desirable status quo (Kaijser and Kronsell, 2014). For these reasons, a binary conceptualization of the climate crisis, which offers a choice between ‘business as usual’ or catastrophe, is inherently restrictive, as it places unfounded limitations on the possible futures that are available to us.

Other scholars have focused more specifically on the use of metaphor to represent climate change as a social, rather than scientific, issue. Atanasova and Koteyko (2017a) provide a scoping review of climate change metaphors appearing in online media sources, highlighting the prevalence of illness, war, and journey as source domains. These source domains are often complicated by the unintended inferences that they produce. Atanasova and Koteyko discuss this in relation to the war source domain, which exemplifies this issue (Atanasova and Koteyko, 2017b). The war metaphor is frequently evoked in climate change discourses. Typically, it is used to promote the urgency of the issue, and to justify the drastic changes that will be required in order to address the crisis. However, multiple other inferences are also solicited here. For instance, the war frame is also populated by the notions of opposing sides, the idea of ‘winning’ the war, and most prevalently the inherent violence that war entails. All of these notions are considerably less useful in relation to the climate crisis. Similar concerns have been raised by Larson (2011), who discusses the use of the war metaphor to describe invasive species. He argues that the long-term use of the war metaphor can result in it becoming vapid and ineffective, a concern echoed by Flusberg et al. (2017).

The discussion of war metaphors forms part of a wider critique of fear appeals in climate change discourse. While foregrounding the threat of global warming is likely to produce an increased sense of urgency, research has suggested that any effects of fear-based messaging are likely to be short lived (Lowe et al., 2006). Recent research has explored alternatives to fear appeals, such as good-natured comedy. Using humor in climate communications has been proposed as a method of processing negative emotions related to the climate crisis, which may in turn enable people to engage more productively in long-term climate action (Osnes et al., 2019); comedy can be an effective tool for reaching new audiences, improving educational outcomes, and ameliorating eco-anxiety (Boykoff and Osnes, 2019; Kaltenbacher and Drews, 2020). However, while humor may support individuals in processing their fear, this may actually reduce risk perception and intention to engage in climate change mitigating behaviors (Skurka et al., 2018). In general, alternatives to fear appeals such as humor and satire or hope-oriented messaging remain under-studied, particularly with regard to the extent to which they can reduce fear without also reducing perception of urgency and behavioral intention (Skurka et al., 2018; Ettinger et al., 2021; Zekavat and Scheel, 2023); and there is no clear consensus as to whether any particular emotional approach is most effective (Reser and Bradley, 2017; Ettinger et al., 2021).

Irrespective of the particular emotional appeal employed in climate communications, there is still a clear need to search for alternative metaphoric framings evoking a more productive view of the climate crisis, given that any approach is likely to make use of metaphor. These framings must avoid the restrictive binary conceptualization of the climate crisis discussed above. Further, any fear appeals must be paired with opportunities for individual response. Suggestions which appear in the literature include CLIMATE

CHANGE IS A MINEFIELD and CLIMATE CHANGE IS AN UNBALANCED LEDGER (emphasis added):

- (5) A far better analogy is that we're walking out onto a **minefield**, and the farther we go, the greater the risk (Mann, 2021, p.180)
- (6) Without the facility for a nation, organization or individual to **balance the debit** from their carbon **budget** with a **credit** earned from offsetting those emissions wealthy actors would find their freedom to enjoy a high carbon lifestyle increasingly difficult to justify (Shaw and Nerlich, 2015, p.39)

Metaphors such as these have the potential to address some of the issues with existing dichotomous metaphors outlined above. Most pertinently, these metaphors suggest climate change to be an ongoing process rather than a discrete event. However, suggestions regarding the effectiveness of these metaphors have generally been speculative, and they have not yet been tested using empirical methodology. Indeed, this is the case for much of the discussion of the impact of metaphorical framing on the public's conceptualization of the climate crisis. Although efforts have been made to empirically demonstrate the relationship between metaphor and the perception of urgency in relation to the climate crisis (Flusberg et al., 2017), no existing research has examined the possibility of a relationship between metaphoric framing and climate doomism. In this study, therefore, we use the empirical methodology developed by Thibodeau and Boroditsky (2011) and Flusberg et al. (2017) to demonstrate a statistically significant relationship between the metaphorical representation of climate change, and feelings of climate doomism.

The primary goal of this research is to understand the relationship between metaphorical presentations of the climate crisis, and feelings of climate doomism. By conducting this research, we aim to identify language that can produce and/or alleviate feelings of paralyzing anxiety in relation to the climate crisis. This objective is motivated by prior research, which has suggested that climate-related anxiety decreases willingness to engage in pro-climate behavior changes (O'Neill and Nicholson-Cole, 2009). Given that one of the primary goals of climate science communication is to engender pro-climate behavioral shifts, avoiding doomism-promoting language is a necessary prerequisite for any successful climate communication strategy. Although there is more work to be done in order to establish a link between addressing doomism and promoting pro-climate behavioral outcomes, it is necessary first to understand the link between language and doomism in relation to the climate crisis. In this paper, we address this prerequisite issue.

2 Methods

2.1 Preliminary research and metaphor selection

In order to choose which metaphors to use in the experimental survey, we first identified common metaphors for climate change that appear in the academic literature. A variety of metaphors has been employed and discussed as potentially significant in the communication of climate change science:

CLIMATE CHANGE IS A WAR (Mangat and Dalby, 2018)

CLIMATE CHANGE IS A CLIFF EDGE (Mann, 2021)

CLIMATE CHANGE IS A BOMB (Mann, 2021)

CLIMATE CHANGE IS A TIPPING POINT (Russill and Nyssa, 2009; van der Hel et al., 2018)

CLIMATE CHANGE IS A MINEFIELD (Mann, 2021)

CLIMATE CHANGE IS AN OVERFLOWING BATH (Revkin, 2009)

CLIMATE CHANGE IS AN UNBALANCED LEDGER (Shaw and Nerlich, 2015; O'Grady, 2017)

The merits of some of the metaphors above have been discussed by front line climate change activists and journalists (e.g., Revkin, 2009; Mann, 2021). However, others are discussed predominantly within academic literature (e.g., Russill and Nyssa, 2009; Mangat and Dalby, 2018). Discussion of their efficacy or otherwise has been largely hypothetical. This study aims to examine metaphors that are already in use, in order to determine which of these is likely to be most effective. It was therefore first necessary to confirm that these metaphors were in use by climate change communicators, as opposed to appearing primarily in the academic literature. The intention here is to guide the existing work of activists and communicators to be more efficient, as opposed to issuing further restrictive instructions to those already engaged in a difficult and complex task.

All the metaphors listed above were determined to be in use by climate change communicators. This was verified using the newspaper database NexisUni (LexisNexis, 2024). Of these, CLIMATE CHANGE IS A MINEFIELD and CLIMATE CHANGE IS A CLIFF EDGE were selected for use in the study, as illustrated with the following examples (emphasis added):

- (7) We are continuing to head for a **precipice** — we say our eyes are open to the risks, but when you look at global emissions, if anything, we are accelerating towards the **cliff edge** (Associated Press, 2022)
- (8) Driving Headlong Toward The Climate Change **Cliff** (Blair, 2019)
- (9) It's a **minefield**. And we are walking farther and farther out onto that **minefield**. And the farther we walk out onto that **minefield**, the more danger that we are going to encounter (Martinez, 2022)
- (10) The disappearance of summer sea ice in the Arctic is one of the first **landmines** in this **minefield** (Worrall, 2021)

This choice was motivated by two factors. First, this study is intended to identify metaphors that do not compromise on communicating the urgent threat of the climate crisis. For this reason, the *tipping point*, the *overflowing bath* and the *unbalanced ledger* were discounted from consideration, as they do not clearly express the immediate danger of the climate emergency.

Second, of the remaining source domains the cliff edge and the minefield were selected as they can be manipulated to exemplify the distinction between metaphors that evoke discrete danger points in the climate crisis, and those that do not. This manipulation is possible

due to the partial nature of metaphorical inferences (Lakoff and Johnson, 1980). For example, when the metaphor CLIMATE CHANGE IS A CLIFF EDGE is used, it is not the case that every element of a cliff directly correlates with some aspect of climate change. Instead, specific elements of the cliff edge are used to make inferences about climate change. When this reasoning process takes place, the structure of the source domain is preserved in a way that is consistent with the target domain (Lakoff, 1993; Sullivan, 2013; Dancygier and Sweetser, 2014). In the above examples, the cliff is framed as a discrete point, a moment of danger, and an undesirable location. This results in an understanding of global warming as comprising discrete points of sudden and extreme danger, which must be avoided. However, this necessarily obscures other elements of the climate crisis, most notably the gradual processes of change. It is possible to conceive of an alternative usage of the metaphor CLIMATE CHANGE IS A CLIFF EDGE. For example:

(11) Taking in the view from the climate change cliff edge

Here, the height of the cliff is emphasized as a useful vantage point for taking in a view. When this understanding of the cliff edge is applied to climate change, our conceptualization of the climate crisis is correspondingly altered. The height of the cliff corresponds to the idea of climate change as offering perspective. Conversely, the idea of discrete danger points is obscured here. This demonstrates that our conceptualization of the climate crisis is dependent on the specific inferences that are made available when using any given metaphor. If a different framing is used to describe the cliff edge, the structure of climate change is accordingly altered.

It is crucial to observe that some inferences are impossible. This is due to the restricting nature of the target domain (Lakoff, 1993; Sullivan, 2013). It is very difficult to conceive of an element of the cliff edge that can lead to the idea of climate change as an ongoing process. This is due to the fact that a discrete point of change is inherent to the concept. This point of change is absolute and irreversible. Either you are at the top of the cliff, aware of the nearby danger but unharmed and unaffected by it, or you are falling over the cliff, with disastrous and irreparable consequences. The cliff edge does not offer a scenario in which there is a gradual worsening of circumstances over time: either you are at the top of the cliff, or the bottom. It is therefore not possible to represent climate change as an ongoing process using this metaphor, as there is no corresponding element of the cliff edge that can be highlighted to evoke this inference. In other words, the cliff edge inheres a binary impacted/non-impacted view of the climate crisis.

In contrast, the metaphor CLIMATE CHANGE IS A MINEFIELD can alternatively evoke either climate change as a binary switch, or as an ongoing process. Examples (9) and (10) project different elements of the minefield source onto climate change; our conceptualization of climate change is altered accordingly. In example (9), the act of walking into the minefield is the highlighted element. This leads to the inference that climate change is a continuous and ongoing threat, intensifying with time, with the danger of stepping on a landmine increasing the further out into the minefield you go, and the further from safety you get. By contrast, example (10) highlights the landmines buried in the minefield. Rather than being understood as a continuous process associated with gradually increasing risks, climate change is instead represented as a series of discrete danger points that can either be triggered or located and avoided.

In the present study, the metaphors CLIMATE CHANGE IS A MINEFIELD and CLIMATE CHANGE IS A CLIFF EDGE are used to exemplify the distinction between metaphors that inhere an end point, and those that do not. The CLIFF EDGE metaphor represents the climate crisis using a binary impacted/non-impacted structure; by contrast, it is possible to employ the metaphor CLIMATE CHANGE IS A MINEFIELD to represent the climate crisis as an ongoing process of increasing risk. This distinction is used in the experimental narrative stimuli in order to test the differential impact of these different metaphorical presentations on feelings of climate doomism.

In addition to testing metaphoric presentation, the presence of human agency was also varied across the experimental stimuli. This manipulation of the presentation of human agency was similarly motivated by prior research in the field. Specifically, it has been suggested that doomist attitudes, and consequently inaction, are produced when fear appeals are not accompanied by a clear opportunity for individual agency (O'Neill and Nicholson-Cole, 2009). That is, fear appeals must appear in conjunction with a method of directing this urgency toward remedial actions and the capacity for a response (Moser and Dilling, 2004). Fear is a natural and appropriate reaction to the scale of the problem we are facing, and people may indeed need to be frightened in order to engage productively with the climate crisis. However, this does not mean that it is accurate to present the climate crisis as unsolvable, or to promote fear without hope. Doing so could likely produce doomist attitudes (Mann, 2021). Therefore, human agency is manipulated in this study in order to test the hypothesis that the absence of human agency is likely to promote doomist attitudes.

Perceived presence or absence of human agency is far from the only element contributing to pro-environmental behaviors; prior studies have demonstrated that multiple other factors, including an individual's age, gender, and ethnicity, can all impact their perception of climate change and willingness to engage in mitigation efforts (Lee et al., 2015; Pearson et al., 2017; Funk, 2021). However, crucially, agency is one element that is possible for climate change communicators to manipulate. While the factors identified above are inherently beyond the control of communicators, representation of individual agency is comparatively malleable. In this study, therefore, we manipulate the presentation of human agency, in order to examine the relationship between it and feelings of climate doomism.

2.2 Stimuli

The narrative stimuli used in this study were directly adapted from Flusberg et al. (2017). Stimuli took the form of a short paragraph, written in the style of a newspaper article (see [Supplementary material](#)). Two different conditions were manipulated within the articles. In keeping with Flusberg et al.'s (2017) approach, the paragraphs differed in the metaphor employed to characterize the climate crisis. In conditions 1 and 2, participants were presented with paragraphs which employed the metaphor CLIMATE CHANGE IS A CLIFF EDGE. By contrast, conditions 3 and 4 used the metaphor CLIMATE CHANGE IS A MINEFIELD, with condition 5 acting as a control condition, offering no metaphorical presentation, and instead discussing the "issue" of climate change. In each of the test conditions, the metaphor was presented three times: in the heading of the paragraph; in the opening sentence; and in the closing sentence. In

addition to metaphorical framing, the presentation of human agency was manipulated across the narrative stimuli. In conditions 1 and 3, human agents were included as actors in the target paragraph. The role of human agents was consistently displayed throughout these paragraphs, including appearances alongside all three of the instances of metaphor usage. By contrast, conditions 2 and 4 omitted this agency. For example, condition 1 read as follows (emphasis is provided here to indicate the metaphoric and agentive language, but was not present in the experimental stimulus):

Climate change is a **cliff edge** – and we are **driving** the earth **towards it**

When will Americans realize that **we** are **driving** the earth **towards** a climate change **cliff edge**? **We** must solve this problem before **we** **push** the earth **over the cliff**. In the United States **we** are working to avoid disaster by reducing **our** carbon footprint in the next few decades. The US has approved dozens of projects as part of an effort to reach net zero greenhouse gas emissions by 2050. **We** will leverage scientific expertise and take individual action to improve the energy efficiency of cars and buildings, reduce personal energy use, and increase the use of renewable energies such as wind and solar. Experts say that if **we** do not lower emissions soon, **we** will experience an increase in extreme weather conditions, more public health problems like a rise in cancer and other diseases, as well as severe economic challenges. **We** must act fast to avoid **falling over this cliff!**

Prior research has shown that use of first-person pronouns in narration leads the reader to mentally simulate events from the perspective of the actor in the event (Brunyé et al., 2009). In health communication, first-person narrative can lead to an increased perception of disease susceptibility via identification with the narrative protagonist, in which the reader adopts the narrator's viewpoint, leading to psychological closeness with them. Given that the reader adopts the viewpoint of a narrator who reports susceptibility to a disease, this leads the reader to also perceive they are vulnerable. This increases the persuasive effect of the narrative, in comparison to those written from other points of view (Chen and Bell, 2022). We anticipate that use of first-person pronouns in conditions 1 and 3 will have the effect of increasing the reader's mental simulation of agency through the promotion of identification with the narrative's viewpoint, similar to Brunyé et al. (2009)'s finding that first-person pronouns lead to mental simulation of agentive perspective. Promotion of identification with the narrative via the first-person viewpoint should also lead to an increased perception of agency, given that the narrative's viewpoint combined with the present tense conveys direct participation in a current, ongoing action.

The control condition was designed to be neutral in its presentation of agency, with some sentences featuring human actors and other omitting these actors. These manipulations resulted in five conditions:

- Condition 1: Cliff edge + Agency
- Condition 2: Cliff edge + No agency
- Condition 3: Minefield + Agency
- Condition 4: Minefield + No agency
- Condition 5: Control

Participants were randomly assigned to one of the four test conditions, or the control condition.

Prior to testing, Flesch (1979) reading ease scores were calculated and confirmed the narrative stimuli to be equally clear and easy to read².

2.3 Doomism measure questions

Following the presentation of the narrative stimuli, participants were asked a series of follow up questions (see [Supplementary materials](#)). First, they were required to answer an attention check question, to confirm that they had carefully read the passage:

- 1 What is the US's 2050 climate change target mentioned in the paragraph?
 - a Net zero greenhouse gas emissions
 - b Cut greenhouse gas emissions in half

Just over 20% of participants failed to answer this question correctly. Participants who answered correctly were then asked three questions measuring aspects of doomism:

- 2 How urgent is it for the US to implement energy reduction programs right away?
- 3 How likely is it that the US will be able to avoid the worst-case scenario of catastrophic climate change?
- 4 To what extent do you believe that your individual actions can help efforts to address the problem of climate change?

Responses were recorded on a Likert scale, scored from 1 to 6, with 1 indicating a low report of the relevant attitude, and 6 indicating a high report. The first question was intended to assess feelings of urgency in relation to the climate crisis. This refers to participants' feelings regarding the need for speed and intensity in climate change mitigation efforts. The second tests for feelings of feasibility. This is intended to assess the participants' beliefs regarding the likelihood of the climate crisis being successfully addressed, with the very worst consequences of global warming being averted. The third tests for individual agency. This investigates whether or not participants believe that there are actions that they can take on an individual level which will have an impact in addressing the climate crisis.

² Reading ease scores all appeared between 47 and 51. Flesch reading ease scores are ranked on a scale of 0–100, with 0 representing a text that is practically unreadable and 100 indicating that a text is extremely easy to read. A score of 60 is considered plain English. Therefore, all of these texts are considered moderately difficult. This does not pose a problem for interpretation of the results, as the level of difficulty was consistent across all 5 conditions. Similarly, all of the paragraphs were reported at a grade 11 reading level, indicating that these passages are judged to be easy to read for most individuals over the age of 17. The similarity of these scores was taken as sufficient evidence that difficulty of interpretation was unlikely to significantly impact the results of this study.

These questions were selected based on extant research, which has suggested climate doomism to be the product of intense feelings of urgency, coupled with a low belief in the feasibility of addressing climate change, and a lack of opportunity for individual agency (Moser and Dilling, 2004; O'Neill and Nicholson-Cole, 2009; Flusberg et al., 2017; van der Hel et al., 2018; Mann, 2021). Doomism was assessed as a high report of urgency, coupled with a low report of feasibility and/or agency.

Following the presentation of the doomism measure questions, participants were also asked two follow-up questions regarding their existing beliefs relating to climate change. They were asked to report their perception of temperature changes in their local area in the last 5 years, and to indicate what they believed was the cause of climate change. Previous research has demonstrated that beliefs regarding these issues have a significant impact on climate change awareness and risk perception (Lee et al., 2015). Individuals who perceive their local area to be getting warmer believe climate change to be a greater threat. Conversely, individuals who believe climate change to be a natural process are much more likely to view climate change as a low-level or non-existent threat. These questions were therefore asked in order to isolate the impact of metaphorical framing on responses to the doomism measure questions from confounding factors which also impact perception of climate change risk.

2.4 Participants

Participants in this study were recruited using Prolific, a UK based online recruitment platform commonly used for survey-based behavioral research. The site is specifically designed for recruitment and participant management (Prolific Team, 2023). A total of 1,542 participants took part in the study. As compensation, participants were offered £1.03. The study was anticipated to take 5 min to complete, meaning that this rate was equivalent to £12.36/h. This pay rate was chosen in order to exceed minimum wage requirements in the US. The study was generally completed faster than anticipated, with a mean participation time of 3 min and 16 s. As a result, participants were on average paid £18.92/h. To participate, respondents were required to be US nationals, English speakers, and to report that they believed in the existence of climate change. The former two factors were selected as the majority of extant research in this area focuses on American English. We chose to continue this trend so that any discrepancy between the results of this and earlier studies can be discussed as potentially significant, given that linguistic, dialectal, or regional variation can be ruled out. Prolific offers pre-screening criteria, so the study was only visible to participants who had already identified themselves as having these characteristics. Participants who do not believe in the existence of climate change were not eligible for this study, as the research questions are focused specifically on climate doomism. It is not logically possible to both reject the existence of climate change and be a climate doomist, as belief in the potential for catastrophic climate change is inherent in climate doomism. For this reason, climate change skeptics were excluded from participation.

Prior to starting the survey, participants were asked to provide informed consent. They were then asked to confirm the answers that they had provided to Prolific during pre-screening. Three questions were asked at this stage:

- 1 What is your nationality?
- 2 What is your first language?
- 3 Do you believe in climate change?

Forty-one respondents provided answers that were inconsistent with their Prolific profiles (4 non-US nationals, 8 non-English speakers, 30 climate change skeptics). This resulted in the total sample size of 1,540 participants³. Prolific provides participant demographic information for age, gender, ethnicity, student status, and employment status. This was provided by the participants upon their registration with the site, and it can be accessed by researchers in an anonymized form. Previous research has indicated that these demographic variables can impact climate change awareness and risk perception (Lee et al., 2015; Pearson et al., 2017; Funk, 2021). A slight majority of the participants were men, with 54% self-identifying as male and 45% identifying as female. The remaining 1% declined to disclose their gender. The mean age of the participants was 37.8, with a median age of 35. The youngest participant was 18, and the oldest was 85. The participants were predominantly white (76%).

2.5 Data collection

2.5.1 Survey distribution

The questionnaire was designed using Qualtrics and distributed via Prolific. Qualtrics provided basic statistics, including the average time taken to complete the survey, the number of participants and the number of attention check failures.

2.5.2 Attention check

Following the presentation of the narrative stimuli, participants were required to answer a multiple-choice attention check question. If they failed to answer this question correctly, the survey ended, and the participants were not shown the doomism measure questions. This step was taken in order to identify participants who had not read the paragraph carefully. Three hundred and forty-one participants, roughly 20% of the sample, failed to answer this question correctly. These participants were distributed relatively evenly across each of the

³ Brysbaert (2019, p. 27) suggests that for an effect size of $d = 0.4$, a one variable between-groups study design with two levels and null hypothesis requires a minimum of 1,084 participants for a study power of 90%. This study design corresponds to our 2 × 2 (metaphor × agency) plus control condition design. By recruiting approximately 1,500 participants we were able to meet or exceed a minimum power of 90%, assuming an effect size typical of psychology studies (e.g., Bosco et al., 2015) while anticipating that a substantial number of participants would fail the attention check. The attention check failure rate in our study is comparable to those reported in Saravanos et al. (2021), which found higher failure rates with questions that require logic to answer correctly, in comparison to studies testing attention checks which only require participants to demonstrate they are reading instructions (e.g., Hauser and Schwartz, 2016). Given that our attention check required participants to both read and recall details of the stimulus paragraph, a higher failure rate was expected, justifying over-sampling. Ultimately the sample size post-attention check was 1,201, or about 11% greater than the minimum recommended number of participants.

five conditions. In total, 1,201 participants provided answers to the pre-screening questions that were consistent with their Prolific profiles and passed the attention check question.

3 Results

3.1 Overview of doomism measure responses

Participants were asked to respond to the three doomism measure questions on a Likert scale from 1 to 6, with 1 representing a low report of the target attitude, and 6 representing a high report. Figures 1, 2 demonstrate that agency and feasibility scores exhibited a relatively normal distribution. Almost half of participants reported scores of 3 or 4, and far fewer participants reported more extreme scores. This effect is consistent across all five conditions. As a result of this distribution, we elected to code scores 1–3 as low, and 4–6 as high. Given the small number of participants reporting very high and very low scores, there is insufficient data in these ranges to produce sufficiently powered ordinal regression models at that level of specificity. Coding the responses as high or low allowed us to circumvent this issue when conducting statistical tests.

By contrast, Figure 3 indicates that regardless of condition, most participants reported very high urgency scores, with relatively few participants reporting scores of 1–3. Therefore, urgency responses were coded as high or low to avoid the issue of basing statistics on the relatively small number of participants who reported low or very low urgency scores. This approach also provides a quantitative definition of doomism: a ‘High’ urgency score, paired with a ‘Low’ feasibility and/or agency score.

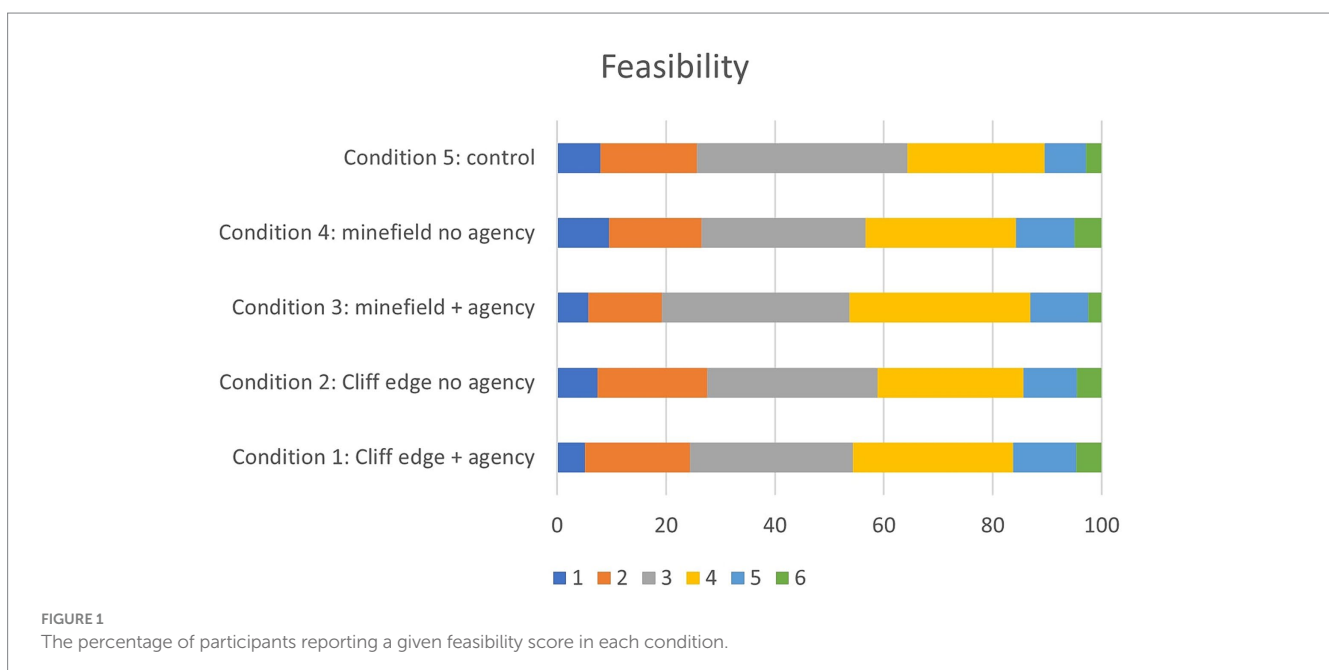
This study aims to isolate the effect of two predictor variables: metaphor presentation, and agency presentation. These were broken down using a categorical structure, coded as two variables, each with three levels. The metaphor variable has the levels ‘Cliff,’ ‘Minefield’ and

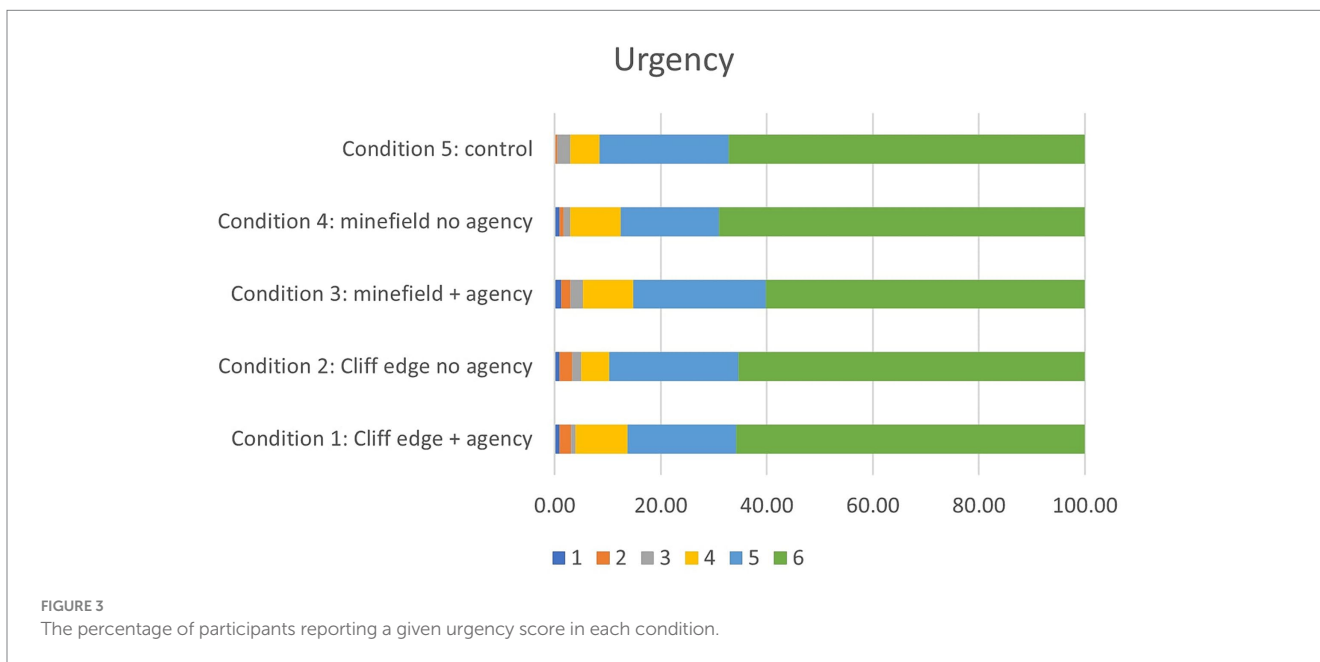
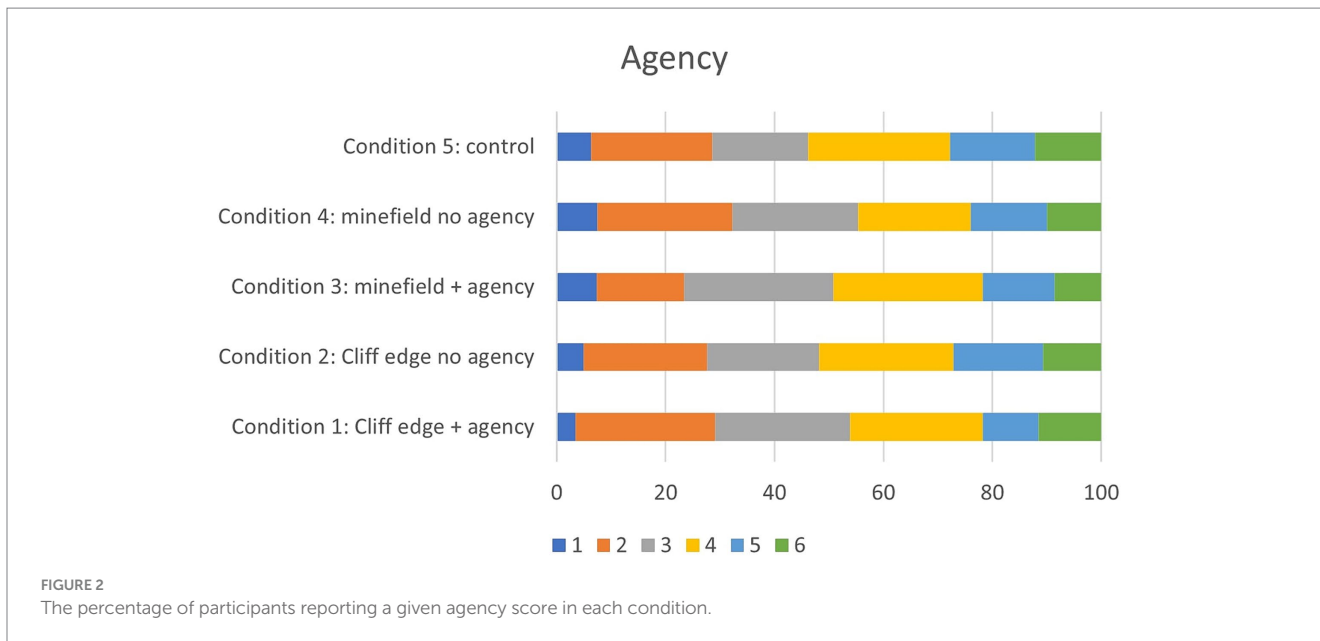
‘Control,’ and the agency variable has the levels ‘Human agent,’ ‘No human agent,’ and ‘Control.’ Treatment coding was used to assign binary numeric values to each of these levels.

Additional testing was conducted which modeled urgency, agency, and feasibility scores as a function of condition presentation. This modeling addresses the impact of potential interactions between agency presentation and metaphorical framing.

The overwhelming majority of participants (96%) reported high urgency scores, with 1,153 respondents recording urgency scores between 4 and 6, as opposed to just 48 reporting low urgency (see Figure 3). The prevalence of high urgency scores is not unexpected in the current climate, given the dramatic rise in extreme weather events in recent years and the consequently heightened profile of the climate crisis. These scores could also potentially be attributed to the fact that climate change skeptics were not eligible to participate in this study. Presumably, skeptics would be considerably more likely to report low urgency scores, given that they do not believe climate change to be an issue. This bias towards high urgency complicates the task of assigning significance to discrepancies between urgency scores across the test conditions, given that these differences are often very small. However, it is worth noting that in the control condition a slightly higher proportion of participants reported high urgency: 97.06%, as compared to 95.60% for the cliff edge condition and 95.88% for the minefield condition.

Participants were considerably less uniform when reporting on feasibility, with 58% of participants reporting low feasibility as opposed to 42% reporting high feasibility. This slight bias towards low feasibility is perhaps also an understandable result given the severity of the ongoing climate crisis, and mirrors other recent studies of perceptions of feasibility in the United States, which report positive feasibility ratings from 38 to 40% of respondents (Dechezleprêtre et al., 2022; Pew Research Center, 2023). Interestingly, agency scores were split relatively evenly; 51% of participants reported low agency, and 49% reported high agency.





A simple chi-squared test reveals a statistically significant correlation between high urgency and low feasibility ($\chi^2=13.041$, $p<0.001$). When urgency scores are high, participants are significantly more likely to report low feasibility. Correspondingly, a participant who reports low urgency is significantly more likely to report high feasibility.

3.2 Test conditions

To assess the significance of metaphorical framing and agency presentation, logistic regression models were constructed for each of the three target attitudes⁴. This was done in two stages. First, full

models were constructed which included all of the covariates that were observed. This revealed which covariates were significant in relation to the specific variable that was being tested. Any covariates that were insignificant at the level $p<0.05$ were removed from the model. Final models were then constructed that showed the test attitude as a function of metaphor presentation and agency presentation, in addition to any statistically significant covariates.

3.2.1 Urgency, agency, and feasibility as a function of metaphor and agency presentation

3.2.1.1 Urgency

Three variables were found to have a statistically significant impact on urgency scores. These were gender; perception of local temperature changes; and beliefs about the cause of climate change. Urgency scores were significantly higher when the respondent was

⁴ Logistic regression models are reported in the [Supplementary materials](#).

female; believed climate change to be anthropogenic in origin; and perceived local temperatures to be rising. Similar results were observed when urgency was modeled as a function of agency presentation, with gender; perception of local temperature change; and beliefs about the cause of climate change once again correlating with high urgency scores.

3.2.1.2 Agency

When agency was modeled as a function of metaphor presentation, age; perception of local temperature change; and beliefs about the cause of climate change were found to be significant predictors. However, metaphorical presentation was not observed to significantly impact agency scores.

A similar result was observed when feelings of agency were modeled as a function of agency presentation. Modeling revealed a significant effect of age and beliefs about the cause of climate change. However, agency presentation did not significantly affect the probability of reporting low agency.

3.2.1.3 Feasibility

A logistic regression model revealed a statistically significant effect of metaphor presentation on feasibility scores. Both the cliff edge and the minefield condition deviated significantly from the control condition. Both were demonstrated to reduce the probability of participants reporting low feasibility. The predicted probability of observing a low feasibility score was 0.66 for the control condition, compared to 0.59 for the cliff edge condition (logit difference: -0.30 , $SE=0.165$, $z=-1.08$, $p>0.1$) and 0.58 for the minefield condition (logit difference: -0.36 , $SE=0.164$, $z=-2.20$, $p<0.05$). This indicates that the minefield condition significantly reduced the likelihood of participants reporting low feasibility.

This result raised the question of whether the observed distinction between the cliff edge and minefield conditions was statistically significant. However, when a model was built to test this, no statistical significance was observed. While results indicate that the minefield condition produces a greater effect on feasibility scores than the cliff edge condition, it appears that the difference between the two conditions is insufficient to be statistically significant.

When feasibility scores were modeled as a function of agency presentation, agency was also seen to significantly impact the probability of participants reporting a low feasibility score. Specifically, participants who saw narrative stimuli which included a human agent were significantly more likely to report high feasibility scores as compared to the control condition. The predicted probability of observing a low feasibility score was 0.66 for the control condition, falling to 0.56 for conditions containing human agency (difference: -0.41 , $SE=0.16$, $z=-2.59$, $p<0.05$). This indicates that presentation of human agency correlates with a decreased probability of low feasibility.

3.2.2 Urgency, agency, and feasibility as a function of condition

Finally, logistic regression models were constructed to investigate the impact of the test conditions on agency, urgency, and feasibility scores. For these models, the control condition was taken as a baseline for comparison. None of the four test conditions were found to significantly affect urgency scores as compared to the control condition, with urgency remaining consistently high across all results.

Similarly, condition did not produce a significant effect on agency scores.

However, condition had a statistically significant effect on feasibility scores. The cliff edge+agency condition and the minefield+agency condition both significantly reduce the probability of a participant reporting low feasibility scores as compared to the control condition. However, this effect was not observed for conditions which omitted human agency. Conditions 2 and 4 did not produce a statistically significant effect on feasibility scores. This is an interesting finding, as there is a statistically significant effect of metaphor presentation when it is isolated from the effect of agency presentation. Therefore, it appears that in the absence of a human agent, metaphorical presentation alone was insufficient to produce feasibility scores that differed significantly from the control condition.

3.3 Summary of results

Table 1 summarizes the key results discussed above. Results are reported as the predicted probability of observing a low score of the test attitude based on a given predictor variable. Significance is reported when the probability of observing a low score is significantly decreased as compared to the control condition. In other words, this indicates that participants in this condition were significantly more likely to report a high score than those in the control condition.

4 Discussion

4.1 Key findings

In this study, we investigated the potential relationship between metaphor, human agency, and feelings of climate doomism. We anticipated that the metaphor CLIMATE CHANGE IS A MINEFIELD, which does not feature an inherent end point, would be less likely to promote doomist attitudes than the metaphor

TABLE 1 Predicted probability of observing a low score of the test attitude based on a given predictor variable.

	Urgency	Agency	Feasibility
Metaphor – Control	0.01	0.80	0.66
Metaphor – Cliff Edge	0.01	0.82	0.59 (.)
Metaphor – Minefield	0.01	0.83	0.57*
Agency – Control	0.03	0.76	0.66
Agency	0.03	0.79	0.56*
No agency	0.03	0.79	0.60
Condition 1	0.01	0.81	0.54*
Condition 2	0.00	0.84	0.27
Condition 3	0.03	0.73	0.54*
Condition 4	0.02	0.91	0.48 (.)

Significance levels: (.) $p<0.1$, * $p<0.05$.

CLIMATE CHANGE IS A CLIFF EDGE, which implies a binary impacted/non-impacted view of the climate crisis. We further hypothesized that the presentation of human agency was likely to reduce feelings of climate doomism as compared to the omission of this agency. Results of statistical modeling indicate that the use of either the CLIFF EDGE or the MINEFIELD metaphor to discuss the climate crisis significantly increases the probability of a participant reporting high feasibility as compared to the control condition. Metaphorical framing makes it more likely that a participant will report that the climate crisis can be successfully addressed, whereas a non-metaphorical framing is less likely to promote this view. This effect was observed to be greater for the MINEFIELD metaphor. This result supports the hypothesis that there is a relationship between metaphor presentation and feelings of climate doomism. Specifically, a metaphorical presentation of climate change maintains high urgency scores and increases feasibility scores. However, although both of the metaphorical conditions produced increased feasibility scores as compared to the control, there was no significant distinction observed between the minefield and cliff edge conditions. This contravenes the hypothesis that metaphors that do not inhere an end point to climate change are less likely to produce doomist attitudes than those that suggest a dichotomous impacted/non-impacted view. Instead, we find that the two metaphors have a comparable impact on feasibility scores.

The results also demonstrate a significant effect of agency presentation on feasibility scores. Conditions which presented human agency were more likely to produce high feasibility scores as compared to the control condition. By contrast, the non-agentive conditions did not produce feasibility scores that differed significantly from the control condition. This supports the hypothesis that foregrounding human agency reduces feelings of doomism as compared to a non-agentive or neutral presentation.

Finally, statistical models which took the original test conditions as a predictor variable indicated that a metaphorical presentation only significantly increased feasibility scores when the metaphor is presented in conjunction with a human agent. This suggests that human agency is a necessary component if a metaphor is employed with the intention of addressing climate doomism.

4.2 General discussion

4.2.1 Interpretation of results

To begin by examining the broadest implications of these results, it is worthwhile to address the observed correlations between high urgency scores and low feasibility scores, and between low feasibility scores and low agency scores. Given that doomism in this study is defined as a high urgency score appearing in conjunction with a low agency and/or feasibility score, these results would suggest that doomism was generally prevalent in the survey participants. That is, participants who believed the climate crisis to be an urgent issue were likely to have low confidence in the ability to successfully address it. Similarly, participants who believed that we are unlikely to successfully address the climate crisis were also likely to report that their individual actions could make very little difference.

Furthermore, it is vital to note that no manipulations of agency presentation or metaphor presentation produced an urgency score that differed significantly from the control conditions. Although

addressing doomism as a barrier to action is crucial, successful climate change communication also effectively conveys the urgent need to act. While eco-anxiety should be alleviated, it cannot be at the expense of motivation to address the crisis. It is therefore essential that we identify metaphors which increase feelings of agency and feasibility *without* compromising high feelings of urgency. This has been a point of concern for other studies examining the relationship between metaphor and reasoning in relation to climate change. The present study therefore makes an important contribution by empirically demonstrating that the metaphors CLIMATE CHANGE IS A CLIFF EDGE and CLIMATE CHANGE IS A MINEFIELD are both able to influence perception of climate change, without reducing urgency scores.

This study also found an effect of agency presentation on feasibility scores. Presenting human agency in the narrative stimuli reduced the likelihood of a participant reporting low feasibility scores as compared to the control condition. In conjunction with consistently high urgency scores, this result can be taken to support the hypothesis that presenting human agency significantly reduces the chances of doomist feelings as compared to the control condition. In addition to agency, metaphor presentation was also found to affect feasibility scores. The use of either metaphor reduces the chances of a participant reporting low feasibility. This finding is not unexpected, given that previous research has consistently pointed to the role of metaphor in conceptualization (Thibodeau and Boroditsky, 2011; Grady, 2016; Flusberg et al., 2017; Thibodeau et al., 2017). Thus, the results of the present study are in concordance with previous research into the effect of metaphor on reasoning.

Crucially, this study furthers existing research by addressing the question of whether there is a significant distinction between metaphors that inhere an end point, and those that do not. On the one hand, modeling found the MINEFIELD metaphor to significantly increase feasibility scores as compared to the control condition. In contrast, although the CLIFF EDGE metaphor was also seen to increase feasibility scores from the control, this result was only marginally significant. This would appear to support the hypothesis that end point metaphors such as the CLIFF EDGE are more likely to produce doomist attitudes than process metaphors such as the MINEFIELD. However, when the CLIFF EDGE and the MINEFIELD conditions were directly compared, we found no significant difference between the two. Future studies are needed to establish whether this effect is robust, and if so whether this result is specific to these two metaphors in particular, or all metaphors which convey a binary impacted/non-impacted state like the CLIFF EDGE and those which convey a process of gradual change like the MINEFIELD. It is nonetheless useful to confirm that the CLIFF EDGE metaphor does not produce a significant decrease in feasibility scores. As such, it appears that it does not exacerbate the problem of climate doomism. Given the widespread usage of the CLIFF EDGE metaphor, it is highly beneficial to confirm that it is not inadvertently promoting doomist attitudes.

However, it is important to note that when feasibility is modeled as a function of condition, the metaphorical conditions only produced a significant increase in feasibility scores when a human agent was also featured. This result suggests that metaphorical presentation only improves feasibility scores when it appears in combination with agency, possibly indicating that agency is a necessary component in metaphorical conceptualization of the climate crisis. The key role of

human agency in climate change mitigation efforts has been proposed in previous studies (e.g., Moser and Dilling, 2004; O'Neill and Nicholson-Cole, 2009); the current study offers empirical confirmation. In a future study it would be worthwhile to examine the relationship between human agency and metaphorical reasoning more explicitly.

In contrast to feasibility scores, agency scores were not significantly affected by metaphor presentation, agency presentation, or condition. Given that doomism is a combination of high urgency with low feasibility and/or low agency, these agency results indicate that there is no significant effect of metaphorical presentation or agency presentation on agency-based doomism, as urgency scores remained high, but agency scores were unaffected. It appears that perceptions of individual agency are less likely to be influenced by metaphor than perceptions of feasibility. Potentially, this could be due to the conceptual differences between the notions of feasibility and agency. Feasibility represents a relatively abstract concept encompassing governmental and societal-level change, whereas agency is connected to the relative impact of much more concrete individual actions such as driving electric cars or eating less meat. It could be the case that metaphorical presentation is therefore better equipped to aid participants in reasoning regarding feasibility. However, it is also arguable that this result calls into question the effectiveness of using individual agency as a measure of doomism; this is discussed in greater detail below.

Finally, perception of local temperature changes and beliefs regarding the cause of climate change were both demonstrated to be statistically significant predictors of agency, urgency, and feasibility scores. These results were consistent with prior research (e.g., Lee et al., 2015), and generally were as expected. For example, it is not surprising that individuals who believe climate change to be anthropogenic in origin are more likely to report high urgency scores than those who believe climate change to be occurring naturally. Participants who reported a belief in anthropogenic climate change were also significantly more likely to report low feasibility scores. This result is noteworthy, as it contradicts the idea that engendering a more accurate understanding of the crisis is likely to promote climate optimism or hope (cf. Ratinen, 2021; Field et al., 2024). In this study, a more accurate understanding of the climate crisis does not correlate with a greater belief that climate change will be successfully addressed; instead, it is associated with pessimism regarding humans' ability to address the crisis successfully. Thus, we find that accurately identifying the anthropogenic nature of climate change does not correlate with the feeling that one's own actions can positively effect change. This in turn suggests that scientifically accurate depiction of the crisis alone will not successfully encourage individuals' climate change mitigation efforts; rather, communication of agency is necessary as well in order to avoid doomism.

4.3 Methodological concerns

4.3.1 Individual agency and doomism

Returning to the question of individual agency, it is worthwhile to discuss the fact that metaphorical framing appears to have no significant effect on agency scores. It is possible to

conclude from this result that metaphorical framing is unable to significantly affect feelings of agency-based climate doomism. However, this can alternatively be understood as calling into question the efficacy of using the report of *individual* agency as a measure of doomist attitudes. The survey question specifically required participants to report the extent to which they perceived their own individual actions as being able to help efforts to address the climate crisis. There are two potential methodological issues which may explain the consistently low agency scores. First, this question places the burden of mitigation efforts on the individual, as opposed to framing them as a collective effort. Given the scale and scope of the climate crisis and the nature of the underlying power structures that sustain it, it is impossible for the actions of any one individual to have a meaningful effect (Stoddard et al., 2021). Questioning perceptions of individual agency may therefore not be an effective measure of doomism, but are rather simply an accurate measure of any individual's inability to address the climate crisis. Respondents may indeed report low agency in response to this question, but they may nonetheless feel optimistic regarding our collective capacity to address the crisis. Second, it is worth noting that although this question assessed individual agency, the agency presented in the narrative stimuli was collective (i.e., "We must act fast," rather than "I must act fast"). Therefore, it may be the case that this question does not provide an accurate assessment of the kind of agency conveyed in the narrative stimuli; while there may have been an effect of the agency conditions on feelings of *collective* agency, this outcome would not have been captured by the question probing *individual* agency. Arguably, the kind of collective agency evoked in the stimuli is captured more effectively by the question intended to assess feasibility, which asked participants about the likelihood of the United States avoiding catastrophic climate change. This question may have inadvertently provided a more accurate assessment of feelings of collective agency, given that the United States can only mitigate the worst effects of climate change through the collective actions of its residents and their elected officials. Therefore, given the significant relationship between metaphorical framing and feasibility scores, we argue that despite the lack of a significant effect on agency scores, the study results are nonetheless evidence of a relationship between metaphorical presentation and feelings of climate doomism.

4.3.2 Attention check

The attention check question was intended to exclude participants who had not read the narrative stimuli carefully. This step was taken in order to prevent the results from being impacted by participants who were not responding to the test condition and were instead reporting exclusively on their pre-existing views of the climate crisis, or who were rushing through the survey and may not even read the stimuli and/or survey questions before selecting their responses (Hauser et al., 2019). However, the high failure rate means that it is pertinent to consider the possibility of a non-response bias effect, in which some participants were more likely to fail the attention check question than others. The question itself was framed in an attempt to avoid this kind of bias, given that it focused on factual information reported in the

stimuli as opposed to an opinion or claim. However, the possibility that a non-response bias effect was seen is difficult to rule out entirely. This is particularly true as participants who failed the attention check question were not asked to respond to any further questions. Had the responses of these participants been recorded, it would have been possible to assess the likelihood of a non-response bias on the basis of their answers. Without these responses, it is not possible to examine whether participants holding particular beliefs were more or less likely to fail the attention check question.

5 Conclusion

This study aimed to investigate the potential relationship between metaphor presentation and climate doomism. We hypothesized that metaphors which presented climate change as having an inherent end point would be more likely to promote doomism than those that presented it as an ongoing process. We further hypothesized that metaphors would be more likely to produce doomist attitudes if human agents were omitted. Analysis of urgency, agency and feasibility scores indicates that there is a statistically significant relationship between metaphor and climate doomism. Specifically, we show that employing metaphor when discussing the climate crisis produces a significant increase in feasibility scores, in conjunction with high urgency scores. In other words, participants who encountered a metaphorical presentation of the climate crisis were significantly less likely to report doomist attitudes than those in the control condition. Similarly, the foregrounding of a human agent was found to significantly increase the probability of a participant reporting high feasibility as compared to the control condition. This suggests that climate doomism may be reduced when humans are presented as having agency in addressing the climate crisis.

While previous studies have demonstrated a link between metaphor and attitudes towards climate change, this study makes an important contribution to the field by demonstrating a significant relationship between metaphor and feelings of climate doomism. Given the increasing prevalence of doomism as a barrier to climate action, it is an important step to establish that metaphorical presentation in climate change communications has the capacity to reduce doomism. However, further research is needed to provide clarification on the effect of different types of metaphors, such as those that inhere an end point as opposed to those that suggest climate change to be an ongoing process.

Although the differential impact of these types of metaphors requires further investigation, it is clear that neither tested metaphor acts to exacerbate the problem of climate doomism. The MINEFIELD metaphor appears to produce a greater impact in reducing doomism, but the CLIFF EDGE metaphor is also effective, albeit to a lesser degree. Based on the findings of this study, climate change communicators should consider the use of the metaphors CLIMATE CHANGE IS A MINEFIELD and CLIMATE CHANGE IS A CLIFF EDGE when they are discussing the climate crisis. Either metaphor has the potential to reduce feelings of climate doomism while

maintaining a high sense of urgency, which is essential for promoting climate change mitigation efforts.

Given that these metaphors are currently commonly used in the United States by both the media and climate change activists, the results of this study can be taken as evidence that climate change communicators are not inadvertently promoting climate doomism with this choice of metaphors. We offer empirical support to the language currently used by front-line communicators, and provide evidence that it is possible to use linguistic framing devices to prompt a reconceptualization of the climate crisis. These results therefore offer cause for optimism, demonstrating that climate doomism is not an inevitable response to our present reality, and showing that it is possible to use language to construct a more hopeful vision of the future.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

This study was approved by the University of British Columbia Behavioural Research Ethics Board. The study was conducted in accordance with local legislation and institutional requirements. Participants provided written informed consent to participate in this study.

Author contributions

CJ: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing, Writing – original draft. ES: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing, Funding acquisition, Project administration, Supervision.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. This research is funded by Social Sciences and Humanities Research Council of Canada Insight Grant no. 435-2022-0474 and the Peter Wall Institute for Advanced Studies, University of British Columbia.

Acknowledgments

The authors thank Avi Lewis, Kimberly Grogan, Sharon Stein, and the audience of *Researching and Applying Metaphor* 16 for their valuable feedback and suggestions; and Nikolas Krstic, the UBC Applied Statistics and Data Science Group, and Emily Cibelli for their assistance with statistical analyses.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcomm.2024.1380092/full#supplementary-material>

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