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Lights, Camera, Climate Action: Investigating Emotional Responses to Climate Change Trailers (Documentary, Television, & Narrative Film)

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(Documentary, Television, & Narrative Film)

by

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ABSTRACT

This research examined the emotional responses elicited by different genres of environmental visual media (VM) trailers. Six undergraduate Environmental Science and Management student participants self-selected to watch trailers from three different genres of VM: a documentary film, a television series, and a narrative film. The goal of this research was to understand the extent people become aware of various environmental VM topics, how VM elicits emotional responses, the effectiveness of VM in promoting action, and to gain a better understanding of how producers and directors can potentially modify VM to have a greater impact on changing participants' attitudes toward climate change. A questionnaire and focus group were conducted simultaneously to gather data on participants' emotional responses to the trailers, as well as their overall attitudes toward climate change. The results showed that, in general, climate change emerged as a popular VM topic, the VM trailers elicited a strong negative emotional response, with some participants considering them an effective means to demonstrate the science of climate change. However, these participants felt that the trailers needed more local, action-oriented, and solution-based content to motivate them to make effective changes. Overall, this study provides insight into the potential impact of environmental VM on changing attitudes toward climate change among college students. The findings suggest a comprehensive seven-part plan specifically designed for filmmakers and scientists. The results of this study could have practical implications for filmmakers, scientists, educators, and policymakers who seek to promote climate change awareness through VM platforms.

KEYWORDS

DEDICATION

I dedicate this research to the memory of all the family, friends, and loved ones who were unable to read this research thesis today. I also dedicate this thesis to the most fluffy, playful, and loving dog, Lucky, who did not get to see me graduate from college. I am forever grateful for their love, guidance, joy, and sacrifices that have made this achievement possible.

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1. INTRODUCTION

1.1. Visual Media Background

Visual media (VM) consumes our everyday life as a way to inform ideas through visual communication rather than through written or spoken language (e.g., radio, podcast, etc.). The COVID-19 pandemic has led to an increase in VM consumption (Global Web Index [GWI], 2020). While the number has declined since the peak of the pandemic (Lai, 2021), these numbers are only expected to increase as people consume more VM. What makes VM compelling is the way it utilizes visual elements such as photographic images, videos, arts, infographics, animations, advertisements, and other forms of visual content to convey information, evoke emotion, and tell a story. Nonetheless, VM, depending upon the person you speak with, can be referred to by slightly different names such as multimedia, mass media, or even video media. For example, VM could be the news anchors telling you the next breaking news, the next video you might watch on your preferred streaming site, or the next photograph you might scroll past on social media. Just as these are all different types of VM, this research has broken down the VM into three different genres. Genres refer to the form, format, category, type, mode, or medium of the VM. This research will focus on three genres of video VM, documentary film, documentary television (TV) series or show, and mainstream narrative feature film (e.g., cinema, movie).

VM, specifically environmental VM, was chosen as the type of science or environmental communication for this research due to the growth of this medium, an increase in scientific illiteracy in the general populace, and my personal interest in filmmaking. Additionally, science topics discussed in classrooms and academia are not often discussed outside the classroom, illustrated by the fact that despite the prolific number of scientific articles written, a significant number of these articles are not read by a broader audience (Funk et al., 2017; Villar, 2021). The

lack of scientific journal consumption by the general public juxtaposed against science-oriented VM consumption, such as documentaries or other science video programs is important. A PEW research study (Funk et al., 2017) found that a dominant source of scientific news, forty-five percent (45%) of Americans, gather science from documentaries, and over half (52%) believe that science in the documentary is factual. This is further supported by Leiseowitz et al. (2022B), who found that fifty-six percent (56%) of Americans hear about scientific concepts like global warming from non-scientific media (e.g., TV, movies, radio, newspapers, magazines, etc.) a least once per week, although the frequency of hearing about global warming in media varies across geographic regions. While the frequency statistics include other media (e.g., spoken and written media) besides the primary focus of this research, it does help explain that a high percentage of people do not consume their scientific knowledge directly from scientists, but rather from the media itself. Consequently, as the number of people watching, consuming VM, and making films, continues to grow (Cox & Depoe, 2015), it becomes more and more critical to know how as scientists to create a compelling story and visual narrative to go along with one's research. As a result, of the high growth and consumption rate of this field, I want to research the effect that different environmental VM have on the communication of environmental issues. Therefore, the underlying goal of this research is to understand what provokes interest, emotion, and action among the general population regarding scientific issues like climate change. To gain insights into how communication of climate change via VM avenues can be altered to achieve more effective results.

1.2. What Role Do Scientists Have?

It is important to acknowledge that scientists are deeply concerned about the state of our planet's ecosystems and lifeforms. Natural scientists are actively working to bring about change and ensure the long-term survival of both the planet and its diverse life systems. I argue that

scientists often lack a storytelling narrative in scientific articles that is necessary to communicate and solve complex issues, like climate change, as many scientists just take on the role of knowledge producers. Mavrodieva et al. (2019) argue that social media and I argue that VM, can bridge this gap by presenting scientific information in a visually appealing and easy-to-understand format that reaches millions of people every hour, far more than scientific articles or journals can. Therefore, I believe, scientists should go beyond the role of a pure scientist (i.e., someone who delivers facts as a basis for societal decision-making) and a science arbiter (i.e., maintains some distance between knowledge users like the general population) (Turnhout et al., 2013). Instead of just reporting on science, scientists need to take a more advocacy and action position to not only allow for more shared scientific knowledge but to solve complex problems like climate change. Turnhout et al. (2013) point out honest broker (i.e., interacts closely with the general public and communicates different "options for action" to those users, based on scientific data) and participatory knowledge producers (i.e., feed directly into the process of producing knowledge) are more of a go-between for the general public. Through the incorporation of the concepts of honest brokers and participatory knowledge producers, as brought up by Turnhout et al., scientists can align themselves with effective methods of disseminating information, in the form of VM, to the general public. This approach emphasizes the need for scientists to go beyond their traditional roles as pure scientists and science arbiters, encouraging them to adopt a more engaged and collaborative approach in their work.

It can be complex to maintain scientific accuracy, integrity, and avoid bias while serving as honest brokers and participatory knowledge producers. However, incorporating the roles presented by Turnhout et al. into a scientist's repertoire could be advantageous, especially when utilizing VM. Reporting science is an important component of the scientific method, requiring

unbiased research and the dissemination of factual information. While this represents a crucial step in the scientific process, I believe that scientists should also engage in visual communication beyond the confines of scientific literature, ensuring scientific accuracy while effectively conveying their ideas visually. Roland Kays emphasizes this from within the forward of the book, *How to Make Science and Nature Films: A Guide for Emerging Documentary Filmmakers*, by stating,

> *"If you are a scientist, [and] you want your work to be known past the narrow audience of your peers who read your journal articles. The old standard of writing a few popular magazine articles about your work is no longer sufficient"* (Nelson & Bertalan, 2015, p. *vii*).

Kays's statement, in my opinion, points out that the lack of expanding scientific knowledge past written research journal articles limits the scope of one's work. Scientific research is often complex, hard to understand, and is written in a way that is not conducive to a general audience's consumption. Creating a more digestible written text, or even better a visual component to one's research could be a useful tool to expand scientific knowledge outside one's small discourse community.

While scientific advancement and knowledge have grown within the scientific community, the lack of digestible material has led people and even some scientists to believe that little headway has been made toward solving environmental issues like climate change with governments, heads of corporations, and the general populace. As environmental issues continue to get more and more complex, the importance of producing high-quality science and nature films becomes increasingly critical (Thys & Aitchison, 2018). Therefore, a deeper understanding of how to communicate the urgency of climate change will help ensure that effective and motivational communication is achieved. In today's world, a scientist who knows how to create an environmental VM is helpful when presenting a scientific topic, to allow more people to see and comprehend the environmental

issues humans face. This ensures that their work has applications outside the academic discourse, research setting, and is translated into formats that allow the general public to more easily access and understand complex environmental issues. In a *National Public Radio* (*NPR*) segment, hosted by Veltman (2023), Max Boykoff an environmental studies professor at the University of Colorado Boulder points out,

> *"Few people pick up and read peer-reviewed literature on a daily basis. So when it comes to climate change, the way in which entertainment media is engaging with it is critically important to helping a global population understand what we're facing"* (Veltman, 2023, ¶19).

As previously mentioned, making a VM narrative story that Boykoff speaks of that is well grounded in scientific facts, is complex, and when you add the multifaceted facts that shape human emotion and perceptions it requires a careful understanding of your audience (Nelson & Bertalan, 2015) becoming more complex. This becomes even more complex with a topic that is often polarized like that of climate change. Additionally, VM is an especially important communication tool as according to Sinnerbrink (2022), eco-cinema's value lies in its capacity to provide a cinematic framework that encourages audiences to reflect, engage, and respond, to ecological and social crises that might otherwise appear too complex to understand or too difficult to overcome. As a result, while creating a scientific VM might be complex and challenging, I do believe it is a worthwhile and essential endeavor because this form of communication can have a profound impact.

1.3. Environmental Filmmaking History

The idea of using VM to communicate scientific knowledge is not a new field. However, the field of visual and environmental communication has increased and grown significantly over the past few years (Cox & Depoe, 2015). Photographers and filmmakers alike, state the adage 'a picture is worth a thousand words.' To understand this maxim, we need to go back to the early

1920s with Robert Flaherty's *Nanook of the North*, which is cited by John Duvall (2017), as constructing the establishment of the environmental documentary filmmaking world. As the development of camera technology began to take off, the documentary world began to take off as well. This led to the creation of a new Academy Award for Best Documentary Feature Film in the early 1940s. Then the environmental movement began to accelerate just a decade later in the 1950s, with the release of Rachel Carson's book, *Silent Spring*. Additionally, her second book, *The Sea Around Us*, was adapted into a documentary film and received considerable critical acclaim, including winning the 1952 Academy Award (Duvall, 2017).

Throughout documentary film history, filmmakers began exploring different cinéma vérité styles, discovering the positives and negatives of different models. These models included a narrative style, a lyrical model, just letting the VM stand alone, and many more models (Duvall, 2017). Directors began experimenting with the use of their own voices, and by the 1950s, this concept evolved into what is now recognized as the auteur theory. The auteur theory served as a method for directors to create films that bore their unique creative voice, effectively assuming the role of the author in their work. Soon after, the emergence of the environmental movement, a new movement was forming, the 'New Hollywood,' which spanned from the late 1960s through the early 1980s. During the 'New Hollywood' era, filmmakers began using cinéma vérité styles, developed abroad, and the auteur theory to develop complex and thought proving environmentally related films like *Chinatown* (1974). Thus began a new movement where Hollywood began to merge field techniques, including the use of more hand-held cameras, a new style of editing, and added ecological and environmental aspects of film (O'Brien, 2016). Film critics such as Garza (2022) and Nayman (2021) designate the failure of *Heaven's Gate* (1980) as the catalyst for the demise of the 'New Hollywood' era in filmmaking. Following this event, the studios regained the

creative authority that they had previously delegated to emerging auteurs. Although the 1980s saw the release of a few unforgettable films from the 'New Hollywood' filmmakers, it was predominantly characterized by commercially appealing movies that played it safe and prioritized profitability. Consequently, this period effectively brought to an end the era of the 'New Hollywood' filmmaking and led to the emergence of the studio blockbuster that we see in today's film industry.

As time progressed, the world of cinema experienced ebbs and flows. In the late 1980s yet another new birth began, the expansion of cable TV (Duvall, 2017). Cable TV allowed for the production of shorter content and enabled audience members to view VM from the comfort of their homes. Shortly after the expansion of cable television, in 2006, one of the most famous forms of environmental VM was released, *An Inconvenient Truth (AIT)*. While this Academy Award-winning documentary film caused controversy, it was very popular and indicated an encouraging shift in public beliefs about climate change (Duvall, 2017). The growth in VM through, documentaries, films, and TV resulted in environmental film festivals appearing throughout the world (Duvall, 2017). While the history of environmental VM and the discipline is not fully encapsulated here, it can be said, that the field will continue to grow as the production of new environmental VM increases. With the rise and fall of these VM movements, eras, historical epochs, and those not described, the research carried out in this thesis draws upon the essential underpinnings of this dynamic history.

1.4. Existing Research Literature Review

As pointed out before, VM consumption has increased. However, the field of environmental VM communication and research only began to take off in the mid-2000s (Jacobsen, 2011; Lin, 2013), coinciding with the release of one of the most monumental

documentary films of the time, *AIT*. These environmental VM campaigns aimed to change people's attitudes, emotions, and inspire pro-environmental behavior and mobilization (Lamer, 2013). However, research done on *AIT* film (Nolan, 2010; Jacobsen, 2011) and other VMs (Lowe et al., 2006; Register, 2019) has indicated a greater level of concern for environmental issues and viewers expressing interest in reducing environmental degradation, but the desire to take action was limited and did not necessarily translate into actual environmental efforts in the future. Pearce & Nerlich (2018), even point out scientific errors can be made within films like *AIT*.

Scholars and researchers have dedicated significant effort to exploring the complexities of full-length films and TV series, contributing to a deeper understanding of the role and influence of the VM in the modern era. For example, research conducted by Register (2019) on the VM genre of documentary films, indicates that while some viewers are motivated to change their lifestyle after watching environmental media, they also tend to find the media depressing and often hopeless. Another study by Vasi et al. (2015) indicated that a documentary film about fracking called *Gasland* (2010) lead to conversation and social movements around anti-fracking via social media. This finding aligns directly with the research conducted by Breviglieri & Sol Osório (2020), highlighting the fact that filmmakers often attempt to communicate a sense of responsibility to their audience. Additionally, through a comparison of two environmental documentary films, *Food, Inc.* (2008) and *Bag It* (2010), Gregg (2011) demonstrates that *Food, Inc.* presents issues broadly without clear action items; whereas, *Bag It* provides targeted solutions that leave viewers more informed and motivated to take action. One such example is a prominent environmental documentary in China, *Under the Dome* (2015), the film was inspired by the harmful effects of air pollution leading to a tumor in the filmmaker's unborn daughter and drew attention to these harmful effects, which may have been instrumental in driving significant policy changes despite

political constraints (Liu et al., 2019). Alternatively, the television series *The Blue Planet II* (2017) provided an opportunity to raise awareness of plastic pollution issues and address them through political means, as noted by Males & Van Aelst (2021). Therefore, environmental filmmakers targeting college students who already have a background in the science, policy, or management of environmental issues, should tailor VM to be about solutions rather than doom-and-gloom (i.e., apocalyptic) perspectives that rob viewers of hope and agency, and try to focus on an individual local scale.

While a significant number of studies indicate that environmental VM can evoke negative emotional states or even inaction, numerous solutions exist to enhance the effectiveness of VM. For example, Basseches et al. (2022) point out that a potential solution to overcoming resistance to understanding and taking action about climate change would be to include media framing, namely that media could do a better job of targeting and tailoring communication to a particular audience. Similarly to Basseches et al. (2022), O'Neill & Nicholson-Cole (2009) points out that instead of using fear to promote climate change, filmmakers should engage with audiences individually, by making it personal and focusing on the smaller scale, while also using the fear narrative selectively. Furthermore, Hart & Feldman's (2016) study highlights that media stories that incorporate images of renewable energy, like solar panels and actionable information, about climate change can effectively promote engagement and increase public interest in the issue. Environmental documentary films have the potential to transform viewers' values and mindsets by utilizing powerful visuals, compelling storytelling, and emotional appeals (Bäckman & Nieminen, 2021). Gregg (2011) argues that effective environmental VM messages should empower and energize individuals who doubt their impact while emphasizing the power of collective action in addressing environmental issues. Another solution as discussed by Sullivan &

White (2019) found that, in the face of increasing public risk perception, decision-makers (and filmmakers) should aim to increase efficacy and use positive imagery of potential future outcomes to promote collective action and agency. Creating a positive narrative and images is important as there is strong evidence that climate change, as a whole, has an impact on mental health, leading to eco-anxiety and/or eco-guilt (Cianconi et al., 2020; Kerr et al., 2022). Therefore, in many ways, when climate change is discussed using negative images it can be viewed synonymously with a bleak, grim, and unsettling future, as its impacts on the planet and society can cause feelings of hopelessness and despair. In other words, the negative imagery associated with climate change evokes a negative emotions connotation that can discourage people from taking action.

This thesis is an interdisciplinary study that goes beyond the exploration of VM alone, as it seeks to investigate the intersection between VM and climate change. Climate change has been the focus of extensive research by scholars and researchers, and it remains a highly controversial and polarizing topic that has created binaries in various aspects of society, from politics to religion (Kennedy et al., 2022; Dunlap et al., 2001; Gore, 2016) or even educational backgrounds (Czarnek et al., 2021). Therefore, this research focuses on climate change as the primary environmental issue and explores how VM narrative is essential to promote activism and initiate effective solutions to this complex problem. However, as I pointed out before, climate change is controversial. As a result, currently, there has been a split political response to the Biden administration's climate change policies and environmental laws (Kennedy et al., 2022), illustrating how controversial and polarizing current governmental actions to combat climate change have become in the United States. For example, Cheng & Gonzales-Ramirez (2021) point to belief bubbles as exacerbating the polarization in the United States, such that people have begun to distrust national media like *The New York Times* or *The Wall Street Journal* and now perceive local news sources as more

trustworthy among the studied college student population. For these reasons, filmmakers and scientists aiming to create effective change must know their audience before filming VM to elicit the most positive change. Ingram (2014) states that the audience will have individual responses to a film based on memories and personal experience, making their belief bubbles difficult to determine for an individual. Therefore, the VM director, producer, creator, filmmaker, and scientist should hone in on the audience to create a film that aligns with the target audience's particular belief bubble to anticipate their political, religious beliefs, geographic areas, memories, and personal experiences. On the other hand, framing the issue in a nonpartisan (McDonald, 2009) way to elicit the most change is challenging. More simply stated, the director should hone in on their audience, as they may have to create a film that aligns with both political or even religious belief bubbles (Cheng & Gonzales-Ramirez, 2021) depending upon the target audience.

As a result of the growing VM presence and the importance of climate change in today's political climate, extensive research has been conducted on the potential risk climate change poses to humanity. However, there has been less research done on media's effect on human perception and effective ways to communicate climate change research. To my knowledge, no one has examined the impact of environmental VM trailers, nor has anyone conducted a comparison study between three genres in terms of their effects on human perception, emotion, and the communication of environmental issues. This is surprising, as a trailer is a chance for moviegoers or viewers to be attracted to consume media (Jerrick, 2013). The trailer is often the first impression provided to the viewer. A trailer is a chance to get people to watch VM and provide a hook to draw in an audience and business. Consequently, a VM with a compelling three-minute trailer may be more likely to draw audiences who want to watch the often two-hour-plus VM. Filling the gap in the research of environmental communication by studying the role trailers have in encouraging

movement toward resolving environmental issues is where I have chosen to focus this VM research. If you are interested in reading more about other scholarship revolving around the topic of environmental VM communication, I encourage you to check out the references cited below.

1.5. Research Question

The topic of climate change has become a crucial aspect of environmental discourse and is now included in almost all environmental arguments (Hughes, 2014). As environmental issues like climate change become increasingly pressing, and VM consumption continues to grow, it is becoming more and more important to study both topics. Therefore, exploring the relationship between VM and environmental issues is essential. As more of the general populace consumes VM compared to scientific articles, knowing how to communicate science to a broader audience is becoming more important. Therefore, using these two important concepts, VM and climate change, I have chosen to study the effect three genres of environmental VM trailers have on human perception. As a result of existing literature, the growth of the VM, the importance of climate change, and my general interests in the topic, my thesis explores four fundamental questions: 1) *How influential has environmental VM been in raising audiences' awareness of various environmental issues?*, 2) *How do different genres of environmental VM affect emotions on environmental issues such as climate change?*, 3) *How effective is environmental VM at prompting awareness and creating action toward addressing an environmental issue?*, and 4) *What could VM producers, directors, and scientists do to improve environmental VM?* Based on these research questions, I selected three different genres of VM. The first genre was a documentary film, represented by *Chasing Ice* (2012), the second genre was a television series represented by *Years of Living Dangerously* (2014), and my third, and last, genre was a mainstream Hollywood narrative

feature film represented by *Don't Look Up* (2021), which will now only be referred to as a narrative film.

Prior to conducting my focus group, I hypothesized that climate change would be the most popular environmental VM topic that participants would be aware of through VM outlets. Secondly, I hypothesized that responses would indicate that the VM trailers do a good job of presenting factual scientific information but its negative or doom-and-gloom narrative led to a state where participants became engulfed in an emotional state of hopelessness and depression. Therefore, participants left the viewing with an unwillingness to act, or even knowing how to act, as the trailers failed to create action items that allowed people to enact change or know how to make a plan to tackle climate change. I also predicted that participants would enjoy the *Don't Look Up* trailer the most, as it would elicit the most positive emotional response, as it ties in with popular culture and creates comedic relief. I did not have a hypothesis for the last question. However, I formed the prior hypotheses based on my personal experiences of watching entire films or TV series, as well as trailers, and other scientific and nonscientific studies, including, but not limited to, Bieniek-Tobasco et al. (2019) and Walsh (2022).

To test the four questions, existing research was examined and a small focus group of college students was surveyed. The focus group was divided into several sections. Firstly, participants were asked a series of demographic questions. Then, there was a general discussion about VM with a few related questions. After that, the three VM trailers were shown, and participants answered pre- and post-viewing questions and discussed their thoughts. Finally, participants were asked to reflect on their experience, share their overall impressions and emotions, and asked what could be done better in a final focus group discussion. The focus group approach was employed to gather participants' understanding of VM, their initial emotional state, and

reactions to the trailers, as well as to identify areas for potential improvement in the communication of environmental VM.

2. METHODOLOGY

This research study methodology can be broken down into three parts, a summary of the three trailer genres, the focus group, and data analysis. The methods used for each part of this study are as follows:

2.1. Three Trailers Genre

To summarize the next section, prior to selecting all the trailers, I made sure to watch the entire associated full-length VM for all three VMs in preparation for this research and also watched the accompanying trailers. The reason these VMs were selected is given in more detail in the following three sections, which present each of the three VM trailers chosen for this research. However, to summarize, it is mostly because they all revolve around the theme of climate change, each belonging to a different genre, and due to their popularity.

2.1.1. *Chasing Ice* (2012)

The first VM genre I chose to include in this study is documentary film, represented by *Chasing Ice* (*CI*), one of the first environmental documentary films I ever watched. *CI* was the catalyst that launched my passion for both environmental science and film. To summarize a long film into three sentences, *CI*, directed by Orlowski-Yang (2012), tells the story and journey of a photographer, James Balog, as he and his crew set up time-lapse cameras in the Arctic to document the glacial transformation within this region. Additionally, Van der Walt (2018) describes *CI* as an on-the-ground perspective, which allowed the camera to unfold the events first hand. Furthermore, Müller (2023) describes *CI* as more of an art than a science, and the mesmerizing

time-lapse footage of melting glaciers serves as a prime example of the aesthetic quality of the film.

CI was chosen for a multitude of reasons, but mostly because I believe it is a compelling film that changed my life, was an Academy Award-nominated documentary film, and provides an 'early' look into climate change documentaries. While I could have chosen more well-known documentaries like *An Inconvenient Truth* (2006), *Before the Flood* (2016), *Seaspiracy* (2021), or the follow-up film *Chasing Coral* (2017), I chose this trailer because of my attachment to the film and the theme of climate change. Moreover, this trailer illustrates the aphorism 'a picture is worth a thousand words' by providing a first-hand example of this notion and makes climate change easy to see rather than the typical use of graphics or projections (Duvall, 2017). Although the entire documentary effectively presents the issues, in my opinion, the trailer (Exposure Labs, 2012) does not do it justice. It is possible that the filmmakers struggled to condense the one-hour and sixteen-minute film into a short preview trailer. Additionally, the film is dated, was a lower-budget production than the other two VM chosen, and as I pointed out before is not a great encapsulation of the entire film as it is hard to capture the overall effect of climate change on glacial recession in the film's two-minute and fourteen-second trailer. Therefore, in my opinion, this is the least effective trailer as it does not show a lot within the trailer but it does provide a look at glacier recession. While I think this trailer will not have a strong emotional attachment for participants, for me the entire film was and it will be interesting to see if the participants have a strong or weak emotional reaction to the film trailer.

Before moving on to the last two genres chosen, I want to state, I could have chosen to 'hand select' clips and make a short trailer myself, I chose to not go this route, as I wanted to study the effectiveness of the main marketing communication tool of the filmmakers. In addition, all

trailers chosen for this study can be found on YouTube as this medium is a free platform and is easy for many to access; furthermore, it has recently emerged as a place to grow and post environmental VM (Nelson & Bertalan, 2015).

2.1.2. Years of Living Dangerously (2014)

The genre of my second chosen VM is a TV series, which was unknown to me until recently. The TV series I selected is the first season of *Years of Living Dangerously* (*YOLD*), a popular 2014 TV series produced by Bach et al. (2014). *YOLD* is similar to the first VM, *CI*, as it once again is a documentary, but it is in the genre of a TV series, specifically a documentary TV series. The first season consists of nine hour-long episodes that cover the impacts of climate change around the world, from the devastation caused by Hurricane Sandy to the threat of rising sea levels in Bangladesh. The series is unique in that it tells these stories from a first-hand perspective, with celebrity correspondents like Michael Hall, Arnold Schwarzenegger, Harrison Ford, and others traveling to different parts of the world to interview those affected by climate change.

Like *CI*, *YOLD* was chosen for multiple reasons; *YOLD* fit the genre of TV series, is climate change related, and additionally, its first season, like *CI*, was so well received it gathered multiple nominations and won a 2014 Primetime Emmy Award. Therefore, one of the main reasons, I chose this as my second VM was due to its popularity and the nominations it received and won. For example, Abraham (2014) states that *YOLD* is "perhaps the most important climate change multimedia communication endeavor in history" (¶1). In addition, in my opinion, the trailer (The YEARS Project, 2014) does an effective job of encapsulating the entire first season into a short two-minute and seven-second clip. Another reason, I chose *YOLD* was due to it being more academically and non-academically researched than *CI* and the next VM, and the presentation of climate change evoked a more negative emotional undertone.

One such study is by Bieniek-Tobasco et al. (2019) who found that the emotional response to the *YOLD* documentary is greatly affected by specific moments of imagery and narrative storytelling, showing just how important visual images are to creating a compelling documentary. Although the research team analyzed a season different from the one I will be examining, which is the second season (2016) produced by National Geographic, my focus will be solely on the first season. This study does provide insights into how participants showed a higher level of concern about climate change and a desire to take action but were unable to figure out how to take that action (Bieniek-Tobasco et al., 2019). Proving to me and Bieniek-Tobasco et al. that while this TV series might have done a good job at increasing concern, and tapping into participants' emotions it does not show solutions nor cue the audience into how to take action themselves. I expect to find similar results to those of the Bieniek-Tobasco et al. study, indicating that participants will not be interested in watching any episodes of these series. This expectation is despite one of the creators, David Gelber, stating that "The goal of this [series]... is to galvanize a national conversation on the realities of climate change and inspire people to share their own stories and empower them to get involved in solutions" (Abraham, 2014, ¶12). Based on this, Bieniek-Tobasco et al. (2019) and I would argue that *YOLD* might have created conversation, but it did not inspire people to take action as they were unable to figure out how to take action on this larger-than-life issue.

Another important aspect of the *YOLD* TV series is the use of celebrities as correspondents. Duvall (2017) explained that the creators of the visual media aimed to broaden their audience demographic by enlisting prominent celebrities and journalists as hosts and investigators. This series reached an estimated thirteen million viewers (Duvall, 2017); this might not have been possible without the participation of these high-profile individuals. However, I would argue that the use of celebrities creates a sense of separation from the audience. The use of celebrities can

make it difficult for the audience to relate to them as they may be seen as being on a pedestal, unlike someone more relatable to the general public. In addition, many of the celebrities used in this TV series are white, which implies that climate change is a white-dominant issue, which is not true. For example, Ray (2021) notes that climate change has given rise to a culture of climate anxiety that is predominantly associated with the white community or a white savior complex. However, not just white people experience climate anxiety (Hickman et al., 2021). While *YOLD* did have some black, indigenous, people of color (BIPOC) it seldom reflects those who are affected most often by the changing climate, BIPOC. Regardless of this limitation, the film industry is dominated by straight white males (Lang, 2020), making in and of itself a complex problem to solve. Instead of relying solely on celebrities, the filmmakers of *YOLD* chose to incorporate climate scientists alongside them as key figureheads. This is very important as according to a 2016 PEW research study (Funk & Kennedy), more people trust climate scientists (78%) when compared to news media (43%). This is especially important when discussing complex and controversial environmental topics as this can add some credibility to the TV series. To summarize, while the use of celebrities might draw in a wider audience, it did not have the same effect I believe the filmmakers had hoped to create.

Comparable to the next and previous VMs, I would like to acknowledge that creating any type of VM is a challenging task, especially for a filmmaker. Romm (2022), one of the Chief Science Advisors for the *YOLD* TV series, has pointed out that the series had the difficult task of presenting climate science to a broad audience while still being scientifically accurate and succinct. While this TV series may have had its limitations, Walsh (2014) cites Nordhaus & Shellenberger's (2014) argument that if *YOLD* had used, "a messaging strategy based primarily around solutions [it] would have better luck dislodging that skepticism" (¶15). To exemplify this idea, within the

TV series, I found that Erickson-Davis (2022) might agree with me, Walsh, Nordhaus & Shellenberger (2014), and others who think solutions may have been a better answer to the impact of this TV series. As Erickson-Davis (2022) found that there has been a lack of follow-up on one of the main issues discussed within the TV series: the Indonesia Tesso Nilo National Park (NP) episodes, which found the NP had lost more forest since the filming of this series. This TV series did not generate the intended action, and these findings prove that the series did a poor job of enacting change on the viewers and participants at the international management level. However, I cannot discredit the filmmakers for trying, as any endeavor of this magnitude has many challenges to satisfy all parties' needs and ultimately cause change to occur.

2.1.3. Don't Look Up (2021)

My last chosen VM genre is represented by *Don't Look Up* (*DLU*), directed by McKay (2021), to encapsulate the genre of narrative film. To summarize, *DLU* at a root level, tells the story of two astronomers who must warn humankind about an approaching asteroid that will be a planet killer unless humanity acts now. While *DLU* is not necessarily presented as an environmental VM per se, it is an allegory and symbol, presented in the form of a satirical commentary on human society's lack of understanding or belief in environmental science issues (Little, 2022; Doyle, 2022; Kalmus, 2021), the lack of trust in media leading to 'fake news,' and even general distrust in politics and government (Atik et al., 2022; Davis & Lewandowsky, 2022) presented in science fiction (sci-fi) style, an allegory to the very polarized world today. However, for the sake of this research, the *DLU* film is mostly providing a view of humanity having the belief in climate change or simply ignoring it as an issue; illustrating instead how humans focus on economic capitalistic gain or selfishness (Hewett, 2022).

Just like the previous two VM genres, *DLU* was chosen for numerous reasons. Firstly, as with the two previous VM, this was a highly nominated motion picture including receiving four Academy Award nominations and comes from a very popular cinematic genre due to it being more mainstream. Secondly, I think the trailer (Netflix, 2021) overall does a good job of encapsulating this genre within the two-hour and twenty-five-minute drama film, in just two-minute and forty-five-second. Thirdly, this film was chosen because it demonstrates the idea that this research intends to present, that climate change continues to haunt human society, and there has been limited action and accountability taken to address it, resulting in failure. Therefore, despite the availability of solutions, such as renewable energy and sustainable lifestyles, these solutions are often ignored or not given enough attention. Lastly, it is worth noting that *DLU* is the most recently released VM. While this study does not examine the impact of the timescale of the release of various VMs, this point is still worth considering.

Before moving on to the focus group section of this method, it is important to note the many other narrative films I could have chosen for this research study. I could have chosen another popular narrative film, *The Day After Tomorrow* (2004). *The Day After Tomorrow* (*DAT*) like, *DLU*, is not entirely accurate as it also is a dramatized film more indicative of sci-fi (The Center for Climate and Energy Solutions [C2ES], 2014). All that being said, a study by Lowe et al. (2006) and Leiserowitz (2004) found that *DAT* succeeded in raising awareness and concern among the viewers regarding climate change events. Specifically, the Lowe et al. (2006) study discovered that three hundred moviegoers surveyed expressed a greater likelihood of taking action; however, they were uncertain about how to initiate such action. Moreover, Leiserowitz's (2004), study found those movie watchers were eleven percent (11%) more concerned when compared to non-watchers. The film also affected human perception concerning risk, conceptual models, behavior,

and policy priorities (Leiserowitz, 2004). While these results are from a different narrative film than *DLU*, they suggest to me that such films can increase awareness but may not directly lead to action. Despite the challenges, it is encouraging to witness the increasing collaboration between filmmakers and scientists, with *DLU* serving as a notable illustration of our progress in the right direction (Angelone, 2022).

2.2. Focus Group

To measure or test the emotional reaction to the climate change issues presented in all three trailers, a small focus group was created. Before conducting this research study, I conducted a comprehensive review of existing literature and performed a meta-analysis, by utilizing Google Scholar and college library resources. This process guided me in creating a study that builds upon the ideas found in current research. To be able to modify and create a new type of study the focus of this research was to examine popular genres of VM utilizing trailers as the mode of viewing. However, before conducting the participatory research, Institutional Review Boards (IRBs) approval was preformed to ensure ethics were considered. After approval, the focus group was attracted via a list serve email recruitment script, and participants were selected based on if they were Environmental Science and Management (ESM) students at Portland State University (PSU). PSU students were selected for this study based on cost considerations, as well as the fact that PSU represents an ethnically diverse student body. In addition, ESM students were chosen due to the curiosity in seeing the views of the next generation of scientists, environmentalists, conservationists, and people with scientific backgrounds who historically are poor at communicating scientific issues to the general populace. While a broader range of students could have been chosen across multiple majors, minors, and departments, I was aiming to understand how ESM students at PSU perceive VM, with the hope that this could then be used to lay the

foundation for further work and indicate that further research should be conducted. While this research in an ideal world, would include people from all kinds of backgrounds (e.g., multiple schools or a nationwide study), and not just small focus groups of PSU ESM students, this was beyond the scope and budget of this research project. However, the data collected will mostly be qualitative and not quantitative, as this was not a broad population survey. Regardless, gathering this smaller sample size of PSU ESM students will be interesting. The general plan for this study was as follows:

The first step was creating a questionnaire consisting of various questions and discussion questions (***Appendix 1***). This questionnaire was created by drawing inspiration from various scholars, Register (2019), Leiserowitz et al. (2022A, 2022B), Bieniek-Tobasco et al. (2019), and others as well as creating new questions based on my research questions. When creating the questionnaire, specific questions were alphabetized (e.g., VM question seven, post-viewing question three) in order to minimize bias. Second, based on this questionnaire, a recruitment script was sent out to a list serve of the PSU ESM department to recruit PSU ESM departmental students. The students were self-selected from a PSU ESM student body of approximately five hundred active students (Portland State University ESM Department, 2023). The email had limited information on the study, to limit bias, apart from informing the volunteer participants that they would watch several short pieces of VM, answer a series of questions and discuss their thoughts to better understand their emotional reaction to the three VM. A reply email was sent out to let participants know they had been selected for this research study, as long as they were ESM students. Candidates were notified twice prior to the focus group as a reminder. The focus group was conducted on April 20, 2023, during a one-time in-person two-hour focus group session on the PSU campus. A total of six ($n = 6$) chose to partake in this research study.

Participants showed up in mid-April 2023 at a PSU classroom to be a part of this research study. During the focus group, participants had a printed-out questionnaire and a consent form in front of themselves, and a PowerPoint (PPT) slideshow was shown on a screen projector to allow participants to follow along with the tasks and watch all three trailers. The participants were greeted and briefly informed about the study, if they agreed to take part in the study they were instructed to sign a consent statement. After consent forms were signed introductions (i.e., names, pronouns, and majors[s] and or minors[s]) were made to allow the space to be as comfortable as possible. However, names were omitted from the research study materials to allow for anonymity. After introductions were made, the audio recording began. VM and genre were defined for participants, based on the definition given in the first introduction section of this research study. At this time, I allowed any questions. Then participants began filling out the questionnaire on paper, beginning first with basic demographic questions to establish a baseline and moving on to the VM questions to begin to process general VM and environmental (or environmentally related) VM. After all participants had completed the first two sections, notes were taken on one discussion question, in which participants were asked to share their thoughts on this question in a round-robin fashion to metacognate on what environmental VM means to them. After this short discussion, pre-questions were filled out to understand if they had or had not watched anything related to the VM, to establish a control. The trailer poster was shown and the VM was then watched on YouTube. Then post-questions were asked to understand what kind of initial emotional response or reaction they had to the trailer. Finally, a discussion question was asked to allow participants to discuss their emotional state after viewing the trailer. This process was repeated for each of the three approximately three-minute length trailers. The order for viewing was chosen based on the sequential date on which the VM was released. Therefore, the documentary film, *CI* on the

Exposure Labs (2012) YouTube page was first, a two-minute and fourteen-second trailer. The TV series, *YOLD* on the The YEARS Project (2014) YouTube page was the second, a two-minute and seven-second trailer. The narrative film, *DLU* (2021) on the Netflix YouTube page was the third, a two-minute and forty-five-second trailer. In an ideal world, it would have been best to show the trailers randomly to participants, to limit bias; this was not done due to time, budget constraints, and a small sample size. In addition, it would have been ideal if participants had watched the entire VM. However, watching this short trailer will provide a glimpse into their initial emotional state. After all trailers were discussed individually for approximately ten minutes each, reflection questions were asked to see if responses had changed after all viewings. These questions aimed to assess if participants' responses had changed, to understand what trailer had the most effect, and collectively evaluate the impact of the trailers. Lastly, a final discussion took place, consisting of one main question (***Appendix 1***) followed by four additional open-ended questions. These supplementary questions were selected based on participants' initial comments probing further into their responses. Three out of the four supplemental questions were predesigned prior to the focus group discussion. The supplemental questions were adapted or deviated from the script based on the participant's responses to the entire focus group discussion questions. Furthermore, multiple alternative pathways were prepared in anticipation of potential discussion topics. Moreover, the questions were carefully formulated to encourage interactive dialogue between participants and myself and gain more insights into the participants' beliefs about environmental VM. This was the longest discussion, approximately thirty minutes, to allow participants to bounce ideas off each other and to reflect on what they just watched. After the two-hour focus group, people were thanked for their time and given a small participatory award. A follow-up in-person reflection was not conducted, as I am only interested in the initial reaction rather than a longer-term reaction.

2.3. Data Analysis

To derive insights for data analysis, from the focus group research study, both the written and verbal responses were analyzed. The responses from the close-ended survey questionnaire (*Appendix 1*) were recorded and organized in Microsoft Excel through manual data entry and coding, checked multiple times for accuracy, and analyzed using basic statistical tests and functions such as summarizing, calculating averages, standard deviations (SD), standard errors (SE), and using conditional statements. A chart and multiple tables were also created to visualize the quantitative data. The qualitative data that was written down during the focus group was entered into Excel. This included notes taken during the group discussion and any other written responses provided by the participants. The recordings were then transcribed using transcription software built into Microsoft Word and verified by a human to extract quotes. Quotes were then either summarized, paraphrased, or quoted with the exclusion of filler words (e.g., like, um, etc.) to provide an accurate glimpse into the focus group discussion, similar to an ethnographic portrait.

3. RESULTS

3.1. Demographic

Based on the demographic questionnaire portion of the questions, during the focus group conducted in mid-April, there were six participants (*n* = 6) who partook in the research study analysis. Participants provided their personal opinions to demographic questions by self-selecting various answers one through nine (*Appendix 1*). Based on the responses to the questionnaire, the participant pool consisted of all six students within the ESM department with three environmental science major students, two environmental studies major students, and one environmental science minor student. Additionally, three students each maintained another major or minor, ranging from an artistic type major, a sustainability minor, and an indigenous nation studies minor. The

participants were comprised of various years of students, one freshman, one sophomore, three juniors, and one senior. The gender distribution consisted of four females, one male, and one participant who identified as another gender. The participants' birth years ranged from 1996 to 2003, with the majority belonging to Generation Z and one being a Millennial. As per the income and intergenerational wealth, the socioeconomic status indicated by students were three low, two medium, and one high. The majority of students identified as white or Caucasian, while two were from ethnic minorities (e.g., BIPOC). All but one participant grew up within the West Coast region, with the remaining participant growing up in the South. The majority of students indicated their political ideology as liberal, with three identifying as strongly liberal, one as moderately liberal, one as neither conservative nor liberal, and one identifying as a leftist (social anarchist). Lastly, five students reported not having any religious beliefs or ideology, while one identified as slightly religious or spiritual.

3.2. Visual Media & Environmental Visual Media

The next section of the questionnaire was comprised of ten close-ended questions on general VM and environmental VM (***Appendix 1***), as well as one open-ended discussion question. Participants on average indicated that they consume VM very often on mobile devices, followed closely by laptops, with television screens and theaters being rarely used. Most participants on average consumed VM on streaming service platforms such as Netflix, Prime Video, Hulu, Disney+, HBO, and Apple TV+ very often. Social media platforms like Facebook, Instagram, Twitter, Snapchat, and TikTok were reported on average to be used between very often or sometimes, but not rarely or never. YouTube on average was reported to be used as frequently as other social media platforms. Screening events such as film festivals and cable television networks on average were rarely used. Although one participant mentioned radio and podcasts, they were

not included in the survey as they are audio media. Regarding environmental VM, four participants reported consuming them daily, while an additional participant reported consuming them weekly and another reported consuming them monthly. All but one participant described themselves as someone who seeks out or is particularly interested in environmental VM. The same participant who indicated monthly consumption also noted that they do not actively seek out or have a particular interest in environmental VM. When it comes to genre or form of consuming environmental VM, participants on average very often consumed it via social media, followed closely by documentary. TV series and narrative films were tied for last place indicating a little less than sometimes.

Participants mentioned many different types of environmentally related VM they had seen, four out of the six participants mentioned various different science and environmentally related YouTube channels or social media content. However, the topic that almost all participants brought up was documentaries. The first documentaries brought up by three participants were, *Plant Earth* (2006) and *The Blue Planet* (2001) a popular David Attenborough narrative documentary series. In addition, one participant also brought forth *Climate Refugees* (2010) a lesser-known film about the human impact of climate change, produced by Michael Nash. Additionally, one participant mentioned viewing general National Geographic documentaries. One other participant even brought forth a very recent academy award-winning film *My Octopus Teacher* (2020) looking at Craig Foster's unique relationship with an octopus. Furthermore, *Cowspiracy: The Sustainability Secret* (2014) and *Seaspiracy* (2021) were brought up multiple times, each of which looked at their respective industries. It is worth noting that there was minimal overlap between the exact content participants watched, apart from *Seaspiracy*, which was mentioned by two participants. Furthermore, there was some overlap in the various environmental content consumed through

YouTube and social media, but it is not fully captured here due to the specificity of the content

mentioned by participants.

The most influential environmental issue that participants had been made aware of due to

VM, is summarized in *Table* **1**, which depicts the average responses of the participants with their

influential popularity ranking from most popular on top to least influential.

Table 1. The influential ranking, most influential at the top and least influential at the bottom, and average response based on the visual media questionnaire question, *"How influential has environmentally related visual media been to your awareness of the following environmental issues?"* Responses were coded as follows: extremely influential (4.0), very influential (3.0), somewhat influential (2.0), slightly influential (1.0), and not at all influential (0.0). The standard error (SE) for the participants is indicated by the plus and minus (±) after the average.

Environmental Issue	Influential Ranking	Average
Climate Change	1	3.5 ± 0.3
Activism & Communities	2	3.3 ± 0.2
Environmental Justice	3	3.2 ± 0.5
Industry (*e.g., Electronic, Plastic, Apparel*)		3.2 ± 0.4
Food & Water		2.8 ± 0.5
Loss of Habitat	4	2.8 ± 0.5
Pollution & Toxic Waste		2.8 ± 0.5
Species Extinction		2.8 ± 0.4
Fossil Fuel & Oil Depletion	5	2.5 ± 0.4
Anthropocene	6	2.2 ± 0.6
Environmental Policy		2.2 ± 0.5
Environmental Management	7	1.8 ± 0.6

According to the questionnaire responses, climate change and industry were the most concerning

environmental issues for participants, with two participants choosing each issue. This finding is

consistent with the results presented in *Table 1*. The remaining participants selected either

Anthropocene or pollution & toxic waste as their top environmental concern, both of which are

closely related to climate change and industry. Based on the average participants' responses being

slightly above neither agree nor disagree, participants only have a slightly optimistic view that we

are too late to do anything about climate change. Participants believed on average that

environmental VM is just above very effective at increasing environmental and scientific

awareness of a particular issue, followed closely by prompting an emotional response and educating viewers about a particular issue. Lastly, on average VM was only somewhat effective at making participants want to change their lifestyle and generating action around an issue.

During the discussion, a few noteworthy handwritten and verbal notes were given by participants for major environmental concerns and/or issues that they had been made aware of from environmentally related VM. The most common thread was the relationship between environmental and social justice issues, in which almost all were pertaining to the impact of human activity on the planet, such as Per-and Polyfluorinated Substances and Per-and Polyfluoroalkyl Substances (PFAS), fast fashion and textile waste, agriculture (e.g., GMOs) and animal malpractice, plastic waste, and climate change. Participants were made aware of these issues via social media and other communication channels like YouTube, which to them played a significant role in raising these participants' awareness of the issue, however, documentaries were also brought up. Multiple participants emphasized how they learned about environmental topics mostly starting with social media, including one encouraging them to take a class about a topic they learned about via a VM. One participant mentioned the classic images of a polar bear and images of oil drilling rigs, as well as Joe Biden's recent plans to drill for oil in Alaska and the related Willow project, both of which are popular topics for videos and infographics on social media. This participant noted that they do not consume broadcast television and therefore would not have seen this content in the news. Another participant emphasized that watching a TED Talk given by Tyrone Hayes about toxicology made them feel,

> *"It's a privilege to know these things [i.e., environmental topics] and it is our duty to act as you like learning these things… I thought they were cool but stresses me out because it makes me worry about the future that my parents are going to live in."*

In response, one other participant highlighted the connection between economic development, consumerism, and human labor issues, and how they are intertwined with environmental conservation efforts. They emphasized the importance of taking a human-centered approach to sustainability, particularly in the context of consumer behavior and product consumption. This same participant highlighted that they wish topics like *"...habitat fragmentation or things that I would be more interested in actually learning about and seeing impacts on I think are less likely to be, emotionally captivating."* Another participant discussed how personal attachment to the topic and ancestral homeland, through local activism and community organizing related to environmental flooding issues, had raised their awareness. However, this same participant also discussed how learning about these topics makes them feel guilty and has caused conflict between family members due to their love of this place. The same participant highlighted that the topics they are interested in regarding specific places are difficult to find or are covered in obscure articles. Extremely specific environmental topics are not very generalized and it is difficult for a broad audience to know about or even find where to learn about these topics, they are often just seen through a tiny window.

3.3. Trailer #1, *Chasing Ice* (*CI*)

During the pre-viewing questionnaire for *CI*, the participants were asked if they had seen the documentary or trailer for this VM. Four participants indicated no while two participants answered unsure; therefore, participants answered no other pre-viewing questions. For the post-viewing questionnaire, all of the participants liked the trailer. All participants believed that the documentary film *CI* focuses on recording the visual rate of change in the glacial landscape due to anthropogenic effects such as global warming. Based on the average participants' responses, most of them had a slightly negative emotional reaction to the film trailer. ***Figure 1*** (or ***Appendix 2***)

summarizes the average emotional response, based on a Likert scale, indicating the highest overall

average negative total emotional reaction (-5.3) for the *CI* trailer. Two participants indicated that

the adjective that best fits their current emotional state was alarmed, while another two participants

mentioned feeling anxious or disheartened. Additionally, two participants reported feeling amazed

as a positive reaction. All participants, except for one, expressed a willingness to watch the entire

documentary within the next three months as indicated by a maybe. The one exception explicitly

stated that yes they would like to watch it.
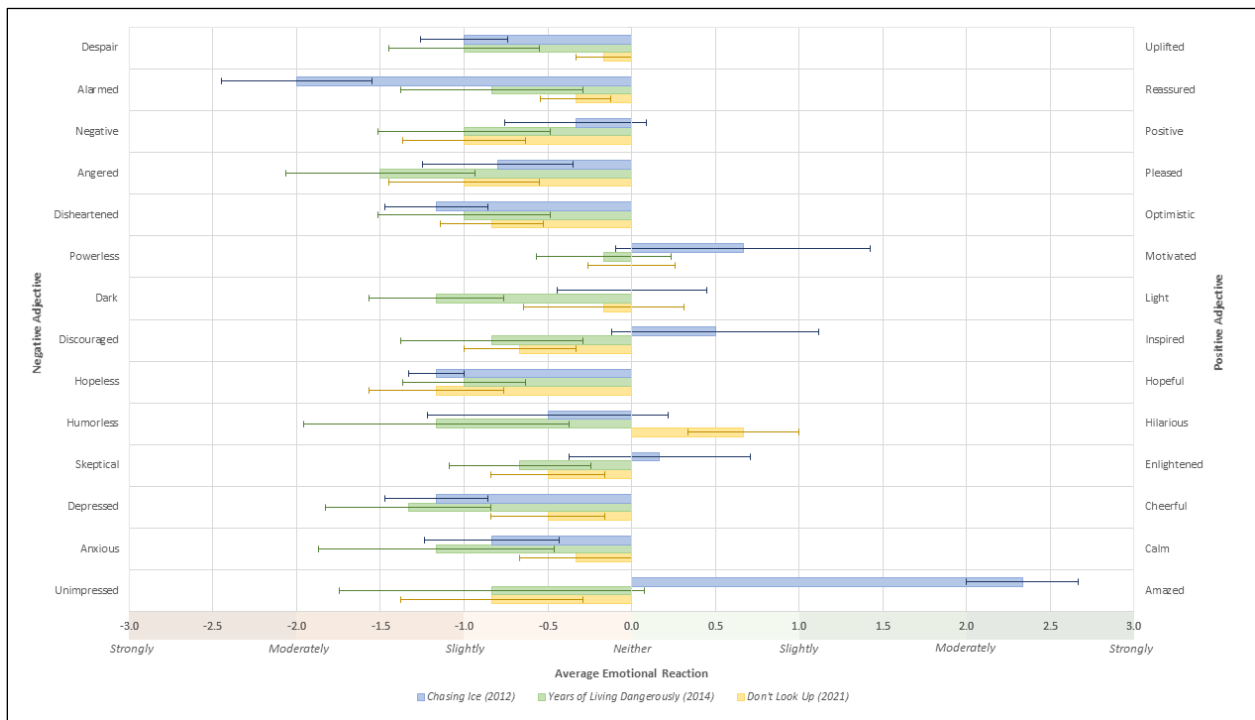
Figure 1. The average emotional reaction for all three trailers, with all trailers indicating a negative emotional total reaction based on adjectives. The data compiled to make the figure came from the following question, *"After watching the X trailer, which adjectives describe your emotional reactions?"* Where *X* represents one of the three trailers. Responses were coded as follows: strongly (-3.0), moderately (-2.0), slightly (-1.0), neither (0.0), slightly (1.0), moderately (2.0), and strongly (3.0). The error bars represent the standard error (SE) for each emotional reaction.

In general, based on the handwritten notes and verbal discussion given by participants, the

participants had various emotional reactions to watching the trailer for *CI*. One individual

described feeling grim and alarmed by the destruction of the ancient landscapes caused by

capitalism and expressed the need to act urgently. This same individual noted similarities between the mountaineering documentary *Free Solo* (2018) and the *CI* film, citing their respective dramatic landscapes as being similar. Another participant felt inspired to finish their degree to help reduce the effects of climate change, but was alarmed by the depressing findings of the scientists featured in the film. Later on, the participant summarized their statements by expressing concern that people, specifically ESM students, have become desensitized to environmental issues, possibly due to the pervasive feeling of doom and helplessness associated with them. They expressed the idea that,

> *"We need to act now, but as individuals, it's really hard for me to go out and save the glacier. There is not enough Flex Seal ® on Earth for me to go and fix the glacier. So you kind of have to desensitize yourself a little bit to it, or else you're going to feel this catastrophic doom."*

An additional participant was amazed by the dedication of the scientists to their glacier research, while also feeling upset about the likely depressing results, but was interested in learning more about the process of the scientist's journey. During the discussion, the same participant brought up the idea of how the issue of climate change has become too Westernized, with a focus primarily on European-centric white men. They pointed out that there are non-Western communities that are publicly involved and affected by the melting glaciers. The participant recommended, *"If the focus was to be on the journey, that the journey should include people who are a part of it in the first place."* Furthermore, one participant felt that the focus of the movie was on landscape photographer Balog, rather than the environment and the causes of melting glaciers, therefore they felt like they had to be amazed by the picture. Moreover, watching the trailer left one participant feeling mostly amazed and anxious, questioning why increasing environmental awareness through VM was not being followed by corresponding action to address issues like melting glaciers, as well as why more people were not aware of the problem and what they could do to help. Finally,

another participant expressed feeling a bit disheartened and powerless during the trailer, but unable to feel extreme emotions due to chronic depression. However, they did express a little frustration similar to another participant about the humor of focusing on the landscape photographer rather than the nature around it. Lastly, while the same participant recognized the climate change issue as a significant global problem, the participant felt guilty for not being as emotionally invested as they thought they should be. They explained that the trailer did not make them feel like they had any personal stakes in the issue, which made it difficult for them to connect with it on an emotional level. In their own words, *"I just feel bad that I'm not as upset as I feel like I should be. It's not something that I have a personal stake in, even though I know it's a large global issue."*

3.4. Trailer #2, *Years of Living Dangerously* (*YOLD*)

During the pre-viewing questionnaire for *YOLD,* the participants were asked if they had seen the TV series or trailer for *YOLD* for either season 1 or 2 of this VM. All participants indicated no, they were not familiar with this VM, and participants, therefore, answered no other pre-viewing questions. For the post-viewing questionnaire, two participants indicated yes they liked the trailer, three indicated no, and one indicated unsure. All participants, to varying degrees, discussed how they believe that the Season 1 TV series *YOLD* focuses on climate change issues in communities globally from the perspective of celebrities. Based on the average participants' response, most of them had a slightly negative emotional reaction to the film trailer, one participant even wrote disgusted as another emotional adjective that describes their reaction. ***Figure 1*** summarizes the average emotional response, based on a Likert scale, indicating the lowest overall average negative total emotional reaction (-13.7) for the *YOLD* trailer. Two participants indicated that the adjective that best fits their current emotional state was unimpressed, while the remaining stated enlightened, anxious, depressed, and hopeless. All participants, except for one, expressed an unwillingness to

watch the entire TV series or episode(s) within the next three months. The one exception explicitly stated they were unsure if they would like to watch it.

Based on the handwritten note and verbal discussion given by participants, they had mixed emotional reactions to watching the trailer for *YOLD*. One individual was unimpressed or even angry, feeling that the use of wealthy celebrities, who often fly around in private jets, to raise awareness about environmental issues is more like virtue signaling than genuine action, in almost a cartoonish type of style. Another participant felt mostly neutral after watching the trailer but emphasized the importance of highlighting the impact of climate change on human communities, not just animals. They pointed out that it is easier to relate to human communities than to an animal that you may have never heard of before. They suggested focusing on one's community, neighbors, the place where they grew up, and the place they love as much more relatable. This participant also felt that the trailer had many similarities to other documentaries, stating, *"The tense music and the people crying and the stock images of the natural disasters, and we're like, well, I've seen that before. What's new?"* Moreover, one participant felt overall unimpressed by the *YOLD* trailer because they found the use of celebrities and generalizations of environmental issues to be cheap and ineffective; as a result, they disliked these types of shows and found them unproductive. They also believed that *YOLD* had a savior complex, implying that individuals need to be saved by celebrities and that we are all part of the problem. The same individual highlighted that they felt celebrities could be using their money for other causes, rather than promoting their own image and self-interest, by appearing in the TV series. Another participant appreciated the focus on real people and their stories at the beginning of the trailer. However, they felt that the involvement of celebrities detracted from the message. For example, they stated that they liked the beginning of the trailer because it highlighted *"real-life people with real-life stories and experiences."*

However, when celebrities appeared, such as Terminator or Han Solo, and talked about wildfires or deforestation, the participant felt that it weakened the impact of the message. They were like, *"Ok, never mind then."* Nevertheless, this same participant acknowledged the potential effectiveness of using celebrities to attract a wider audience, they also drew a parallel to the situation during the COVID-19 pandemic, when celebrities singing "Imagine" by John Lennon failed to make an impact and instead left them feeling disgusted. Furthermore, another participant felt disheartened by seeing people's experiences and felt depressed and sad, as an empath. They suggested using other VM genres of trailers to bring in more environmental awareness. Finally, one individual felt that the trailer left them feeling hopeless about the need for celebrities to generate interest in environmental issues that affect both local and global communities, rather than the issues themselves being enough to motivate action. During the discussion, the same individual shared their frustration with the filmmakers' portrayal of humans as docile and unintelligent, who would consume TV trash. This disgust comes mostly from the use of celebrities in the documentary but they also acknowledged that some viewers may not be aware of the issues raised and that the TV series could serve as an educational tool. Emphasizing that while it might be common knowledge in academic circles, others may not be aware of these issues and may need to be made aware, in easier-to-understand ways. They added that although, unfortunately, celebrities have to be used to attract attention if it helps to raise awareness, it might be necessary. They expressed a sense of hopelessness that this is the case but acknowledged that bringing in celebrities could potentially reach a wider audience and create awareness.

3.5. Trailer #3, *Don't Look Up* (*DLU*)

During the pre-viewing questionnaire for *DLU*, the participants were asked if they had seen the film or trailer for this VM. All participants except one indicated yes they were familiar with

this VM, apart from one indicating no. Four out of the five had watched the entire film and one had just seen the trailer. Participants gave varied responses, including hearing positive reviews, being drawn by the presence of a particular actor, finding the entertainment value and environmental theme appealing, showing up on their Netflix page, and wanting to see how the issue would be addressed. Responses varied once again, with some recalling the film's portrayal of a realistic societal outcome, others remembering the apocalyptic plot theme, and multiple participants recalling the character portrayal, specifically Leonardo DiCaprio's performance. Participants largely indicated that the film or trailer had little or no impact on their opinions or emotions, with one reaffirming their preexisting beliefs, one already upset due to the COVID-19 pandemic's timing, one expressed being unimpressed, and two had no clear recollection of being affected.

For the post-viewing questionnaire, two participants indicated yes they liked the trailer, one indicated no, and three indicated unsure. Participants, in general, thought the film explores the interplay between impending doom and greed, with a giant meteor threatening humanity and general apathy towards the crisis due to monetary interests. Based on the average participants' responses, most of them had a slightly negative emotional reaction to the film trailer. ***Figure 1*** summarizes the average emotional response, based on a Likert scale, indicating the middle overall average negative total emotional reaction (-6.8) for the *DLU* trailer. Two participants indicated that the adjective that best fit their current emotional state was unimpressed, while the remaining stated angered, hopeless (plus hilarious), hilarious, and one even indicated indifferent, which was not on the scale. There was a split response regarding whether participants would like to watch the film in the next three months, with three individuals indicating yes and three indicating no, two of those who initially said yes wrote in comments under the question to the effect that they would not

watch it again. Furthermore, one participant who had not seen the film or trailer and one participant who had only seen the trailer and not the entire film before expressed unwillingness to watch the entire movie.

Based on the handwritten notes and verbal discussion given by the participants, they had mixed emotional reactions to watching the trailer for *DLU*. One participant was angered by the portrayal of society's shallowness and lack of political will to address climate change to make the majority of our lives better. This participant expressed their appreciation of the film *Idiocracy* (2006) in its portrayal of humanity compared to this film. They expressed their frustration and anger in the following quote *"Hollywood keeps on making these artsy metaphors to look at climate change, but I wish for a direct call to action."* Another participant found the film to be a fantastical representation or metaphor for the current state of affairs, leading to the death of all humans. They expressed despair about the lack of action being taken and how no one seems to be listening to the problem. In their own words,

> *"I don't think that people are going to look at this and inspire anyone to go and learn more about what's really happening or make someone, want to do better or be better. The people, who are ignoring climate change, are not going to watch the film and change their minds and views. They are just going to watch the movie and move on."*

Moreover, one participant found the film entertaining but not a realistic portrayal of science, instead they felt that the movie was a good commentary on how government or corporate interests will generally take precedence over public interests. This same participant described the film as being dark humor and even drew parallels to the *YOLD* VM trailer as both used celebrities to discuss climate change. For instance, this participant states, *"It's easier to watch this movie from a position of privilege and from a position where you know you have influence."* They then go on to cite, while they do believe this film does a good job at passing the time, they expressed their frustration with Leonardo DiCaprio as a climate change activist; such as mentioning that he was

involved with the *Before The Flood* film and they did not like him in this follow-up film. Furthermore, one participant found the film to be a respectable commentary on how the government is generally ignorant of climate change, but they had a hard time dealing with it during the COVID-19 pandemic when they watched it for the first time. They were already tired of hearing about how people are stupid and poor at dealing with issues, and the film made them generally mad. However, this participant even stated, "*It's hard to make light of something so sad.*" One participant expressed being unimpressed with the use of big-name celebrities and the Americanization of the film to raise awareness about environmental issues. Instead, they felt that the movie was made primarily to make money, rather than to increase awareness. However, they did appreciate the accurate portrayal of the character Kate Dibiasky as an activist, played by Jennifer Lawrence, but were disheartened and sad to see her being laughed at and ignored, mirroring the experience of many environmental activists. Lastly, another participant was upset, sad, unimpressed, and annoyed by the need for poorly written mainstream films with celebrities to convey climate change ideas to a general audience, even going on to describe *DLU* as being non-artsy. However, they acknowledged that this film might be better suited for the general public to be entertained than peer-reviewed articles or a nature documentary about climate change. To summarize their general ideas, they state, *"It sucks people need this to be a little aware of climate change."* Overall, the participants had mixed emotions about the film trailer, with some finding it entertaining and others feeling frustrated by its approach to addressing important issues. At the end of the discussion, all participants expressed their hope that this parody of the film would not become a reality and would remain a sci-fi film.

3.6. Reflection

The next section of the questionnaire consisted of ten reflection questions (***Appendix 1***) pertaining to all the environmental VM trailers. When comparing the response to the same question before and after viewing the trailers, there was a slight difference. Although the sample size is small, it is noteworthy that the averages vary slightly from the first time I asked this question, although this difference will not be heavily discussed. However, the difference in averages between the two times these questions were asked are presented in ***Table 2*** and indicates a lower or slight decrease in all statements. Participants on average believed that environmental VM is just above somewhat effective at prompting an emotion, it is just above somewhat effective at increasing environmental and scientific awareness of a particular issue, it is somewhat effective at educating viewers about a particular issue and making participants want to change their lifestyle, and lastly, is slightly effective at generating action around an issue.

Table 2. A comparison between the first and second rounds of the questionnaire question, *"How effective is environmentally related visual media in the following?"* Responses were coded as follows: extremely effective (4.0), very effective (3.0), somewhat effective (2.0), slightly effective (1.0), and not at all effective (0.0). The standard error (SE) for the participants is indicated by the plus and minus (±) after the averages.

Statement	Averages 1st	Averages 2nd	Difference
Increasing environmental and scientific awareness of a particular issue	3.7 ± 0.2	2.3 ± 0.2	-1.3
Educating viewers about a particular issue	3.3 ± 0.3	2.0 ± 0.4	-1.3
Generating action around an issue	2.3 ± 0.6	1.4 ± 0.4	-0.9
Making you want to change your lifestyle	2.5 ± 0.3	2.0 ± 0.6	-0.5
Prompting an emotional response	3.5 ± 0.3	3.2 ± 0.3	-0.3

The participants' attitudes did not change at all the first and second times this question was asked, about if they believe we are too late to do anything about climate change. On average, the participants' responses leaned slightly above neither agree nor disagree, with participants staying the same that we are only slightly optimistic that we are too late to do anything about climate change. None of the trailers changed participants' opinions about climate change.

Based on the average responses of the participants, which trailer elicited the greatest emotional response? In order, *CI* was the greatest emotional response on average, followed by *YOLD*, while *DLU* elicited the least emotional response (**Table 3**). However, participants gave varying reasons for why they chose their number one response. One participant believed the *DLU* parody is a great call to arms, two believed *CI* was the most real, one hated the others and liked *CI* the most, one cited the people-focused story of *YOLD* as being effective, and even *DLU* was the most irritating for one participant. Based on the average responses of the participants, which trailer encouraged or motivated them to watch the entire VM? In order, *CI* was the most likely to watch on average, followed by *YOLD*, with *DLU* being the least likely (**Table 3**). As with the previous question, participants gave varying reasons for why they chose their number one response, ranging from four finding *CI* interesting and something from which they could gain scientific knowledge, one already having seen *DLU*, and one liked the celebrity aspect and the part of *YOLD* that involved connecting with locals. Lastly, based on the average responses of the participants, which trailer makes them most want to change their lifestyle or take action? In order, *CI* had the highest impact in making them want to change their lifestyle or take action on average, followed by *YOLD*; *DLU* had the least impact in making them want to change their lifestyle or take action (**Table 3**). Just like the previous two questions, participants gave varying reasons for why they chose their number one response. One participant chose *DLU* as rank one because they did not want to be like the people in the film. Five participants chose *CI* for different reasons, including appreciating the scientists' physically demonstrating glacier melting, not wanting to contribute to melting glaciers, liking the film the most, actually seeing something happen in the film, and finding it the least annoying and most focused.

Table 3. The average responses to reflection questionnaire questions four, five, and six. Responses were coded as follows: *Q4* [greatest emotional response (1.0) and least emotional response (3.0)]; *Q5* [most likely to watch (1.0) and least likely to watch (3.0)]; *Q6* [most make you want to change your lifestyle or take action (1.0) and least makes you want to change your lifestyle or take action (3.0)]. The standard error (SE) for the participants is indicated by the plus and minus (±) after the average.

Question	Average Response		
	Chasing Ice **(2012)**	*Years of Living Dangerously* **(2014)**	*Don't Look Up* **(2021)**
Q4. Rank the trailers, according to which one had the greatest or least emotional response.	1.7 ± 0.3	2.0 ± 0.3	2.2 ± 0.4
Q5. Rank the trailers, according to which one most or least encouraged or motivated you to watch the entire documentary, TV series, or film.	1.4 ± 0.2	2.2 ± 0.3	2.4 ± 0.4
Q6. Rank the trailers, according to which trailer makes you most or least want to change your lifestyle or take action.	1.2 ± 0.2	2.2 ± 0.2	2.7 ± 0.3

It is worth noting that for these three questions, one participant was confused and chose to provide only one response per question. As a result, there is a single response for each question, indicated by the numbers one, two, or three corresponding to the three questions. Although their values were used in compiling the data, their reasons were not given for the second and third questions in this section due to this unique response style and not having a rank one.

Based on the twenty-eight (28) emotional adjectives participants could choose from that best fit their current emotional state after watching all three trailers, seventeen (17) out of eighteen (18) of the adjectives selected were on the negative emotional spectrum, the positive adjective appeared when one participant selected motivated. The most common emotional adjective is summarized in *Table 4*, which depicts the total counts (sum) for all participants based on the highest total counts to the least counts.

Table 4. The popularly ranking and count (sums), most counts at the top and least counts at the bottom, of responses based on the reflection questionnaire question, *"Which three emotional adjectives best fits your current emotional state after watching all three trailers?"*

Emotional Adjective	Popularly Ranking	Counts
Unimpressed	1	5
Angered	2	3
Depressed		3
Alarmed	3	2
Discouraged		1
Disheartened		1
Negative	4	1
Motivated		1
Skeptical		1

Out of the six participants, three agreed and two neither agreed nor disagreed that environmental VM is often presented as doom-and-gloom. Lastly, four participants selected that VM influenced their decision to go into an environmental field, while two indicated that it did not.

Finally, there were several handwritten suggestions made by participants regarding changes that could be made to environmental VM trailers watched today. One participant suggested changing the *YOLD* trailer by incorporating direct confrontation with industries that lobby for certain policies and utilizing celebrities to discuss global demilitarization and reliance on fossil fuels. Another participant suggested making all the trailers more serious. Additionally, one participant recommended changing the positionality of the trailers to focus on a single micro issue, like *CI*, which would motivate viewers to advocate and share what they have watched with others. Furthermore, another participant suggested shifting the focus of the trailers from the people in the VM to the environmental issue itself, making it less self-centered. Alternatively, one participant suggested exploring different genres for the trailers, such as animated or biographical historical drama, citing examples such as *Wall-E* (2008) and *Chernobyl* (2019). Lastly, one participant gave a lengthy explanation of various changes that could be made, including removing celebrities, changing the music selections, and creating multiple types of trailers, such as one that

is focused on the scientific findings and another that is less serious and more humorous (e.g., mockumentary style). These will be presented in more detail in the following section.

3.7. Focus Group Final Discussion

Based on the handwritten notes and verbal discussions provided by the participants, numerous emotional reactions were observed in response to watching all three of the VM trailers. One participant was alarmed and concerned about how conversations regarding environmental issues are framed in mainstream media. They believed that mainstream media is not adequately addressing the issue and that other avenues are having discussions but those environmental discussions are not often being shown in mainstream media. They cited a relative who does not believe in climate change despite having two family members working in environmental fields and does not think that that relative would understand *DLU* as a metaphor for climate change. This participant also suggested in their notes that pairing celebrities with scientists could be useful, which was discussed later by this participant. Another participant felt annoyed that people do not take environmental issues seriously enough and that it is necessary to use *"sparkly garnishes and humor on the frightening truth"* to get people's attention and to make them listen, but even then, they often do not care. However, they acknowledged that tastefully done celebrity appearances by credible individuals could be beneficial, providing examples like Bill Nye or Greta Thunberg. They believed those people could be useful in creating an effective environmental VM. An additional participant was motivated to advocate for better media that accurately portrays real issues to empower and educate the public. One participant felt that the use of celebrities in the trailers, used to attract more viewership for environmentally related VM, distracted from the environmental issues and therefore they were unimpressed by them. However, they acknowledged

that different attractions might be necessary for some people. This participant also enjoyed *CI* the

most but had a hard time with *YOLD* and *DLU*. They chose *CI* because,

> *"It's about a particular issue… [and] centers around something intimate. People can feel like they've watched it and come out of it with some sort of new knowledge or feel empowered to say something about that because it is a niche issue you probably didn't know about before you watched it… I personally like to consume that type of media where I learn something from it."*

The other two VMs did not have the same effect because this participant felt like *YOLD* did not

teach them anything about climate change, and *DLU* was a Hollywood amalgamation that they did

not enjoy. Meanwhile, one other participant was anxious and unimpressed overall because all the

VM trailers had something besides the environmental issue to pull in viewers, such as a funny

scientist (*CI*) or celebrities (*YOLD* and *DLU*). However, they also understood that a different

attraction is needed to keep some audiences engaged but found it sad that this is needed. They

agreed and were frustrated that *"sparkly garnishes"* and humor were needed to involve audiences.

This participant enjoyed *CI* as it did the best job at emotionally connecting them with the images,

but expressed a little frustration with it focusing on the scientist rather than just their findings.

However, they cited National Geographic as a good example of a well-done VM because it is

scientifically informative and often tells a good story with a low narrative voice. Additionally, one

participant was angered by the way America approaches environmental awareness and was

disappointed that this is what needs to be shown to the general public to raise awareness and

discuss climate change. Moreover, one participant was annoyed by the need for celebrity focus,

portrayal, productions, and sound in all the VM trailers. The same participant was shocked that

they liked *CI* the most because it made them feel the least emotion, as it had useful information.

YOLD and *DLU* felt like *"media junk food garbage"* that they would watch with a relative.

Overall, the participants had a diverse range of emotional reactions to the three environmental VM

trailers, including feeling alarmed, concerned, annoyed, anxious, motivated, unimpressed, and angered, with varying perspectives on the use of celebrities, distractions, and the need for better media portrayals.

The first supplemental question was designed to confirm the idea and assess the participants' agreement or disagreement with scholarly literature findings. The question path was chosen based on the initial discussion observation that the majority of participants in the earlier stages of the study appeared to align with the notion of environmental VM containing pessimistic or negative (e.g., doom-and-gloom) narratives. Therefore, the main objective was to determine if the participants agree or disagree with scholarly literature's assessment of VM as portraying a negative narrative characterized by doom-and-gloom. If participants agreed with the statement that VM is often presented in a negative narrative, the successive question was focused on identifying possible approaches to shift towards a style that better aligns with a more positive or personally appealing narrative. To which a few participants responded, one citing they did not see the doom-and-gloom narrative, and it did not give them doom-and-gloom per se, but *"It's the way that it's presented that's giving me anxiety and doom-and-gloom."* It is the way the VM has to be presented, with celebrities, to gather a broader audience of real-life people that gives them a doom-and-gloom feeling. Another participant cites seeing and feeling a doom-and-gloom narrative, as they see the capitalistic issues with society, such that humans will, choose *"profits over people."* They cite the doom-and-gloom discussed in various college classes, as environmental topics can have very depressing issues, as there is a lack of trust in governmental and political willpower to address climate change. However, there are solutions to solve climate change that are relatively safe, such as seaweed farming (e.g., Yong et al., 2022; Ross et al., 2022), which can reduce climate change, as a tool and nature-based technology solution. This participant even cited an unknown

study (N'Yeurt et al., 2012) which states that if we were to convert nine percent of our oceans to seaweed farming this technology could reduce the amount of carbon dioxide concentration in the atmosphere, something which could be achievable, giving them hope that there is a way out of this depressing issue. Another participant discussed how doom-and-gloom, like natural disasters, are often areas of focus in media because we as a society *"are very quick to focus on things that are negative because it's easy, because it's an easy thing to sensationalize, past environmental issues"* to evoke a sense of feeling. However, like the previous participants, this participant believes we need to focus more on solutions, as there are many; it is just not a topic that VM discusses. Instead, this participant states that VM often is shown in a narrative that states, *"Here's the problem, and usually what comes after isn't how to fix it, it's how you feel. And I think people's feelings would change if the solution is also attached to the price tag of the problem."* An additional participant discussed how we could be having more important conversations, and learning about real solutions, like poop composting that is much less dark than the gloomy narrative approach so often presented in American media. The negative narrative tends to be more sensationalized or clickbait-oriented, generating more discussion compared to environmentally-focused solutions, which may receive less attention. However, the same participant who brought up seaweed farming did talk about *"controversy feeding algorithms"* on social media to get more viewership when presented in a negative unhopeful light; whereas, when presented in a hopeful message it might not get as much viewership. One participant agrees with this statement. This participant discusses how if people saw local organizing movements putting solutions into motion, it might prompt them to question why those solutions are not being implemented in their own communities, which could lead to people mobilizing resulting in dangerous situations for certain people. The participant who brought up the idea that controversies are popular then agrees with the dangerous aspect of

bringing solutions to light. For example, they suggest that individuals possibly are hiding solutions within unrelated content to evade restrictions, demonetization, or even being shut down, and thereby enabling effective message distribution.

I then interjected with a new supplemental question by stating that the group is discussing the negative aspects of VM, including not loving it but understanding why it might be used, such as the use of celebrities to gain a wider audience. With this knowledge in mind, a follow-up question was asked, if you were a filmmaker, what would you have done differently? One participant stated that they would make a VM about *"real people exercising the real solution, which would maybe inspire people to do similar things"* Another participant then went on to emphasize an earlier statement that not all celebrity appearances are bad. They see particular scientific people who have a passion as sometimes being a credible source of knowledge. They want to bring this forward as they want to make a clear connection that *"not all celebrities are bad,"* but more celebrities need to prioritize making their beliefs known. For example, they did not know that DiCaprio had roots in climate change activism. They suggested that VM needs to discuss why these celebrities are involved in activism. In general, there needs to be some sort of shift in the way these topics are communicated. The participant who states that more *"real people"* need to be shown takes some issue with the use of celebrities as being credible and tasteful. They would much rather have regular people be the focus and find regular people interesting, but this is often not the focus or direction of mainstream media. One participant chimed in, the participant who in the first focus group final discussion suggested pairing celebrities with scientists, expanded on this stating that having a charismatic scientist (e.g., Tyrone Hayes, Neil deGrasse Tyson, Rachael Carson), paired with celebrities (e.g., DiCaprio) might make for a good pairing for conversation.

At this time a second-to-last supplemental question was asked due to the participants' overall negative emotional response to the trailers, such as feeling hopelessness and depression. Based on the idea that VM often presents issues in a negative light, a question was raised, about what can be done by filmmakers to inspire more action rather than inaction? Is it by providing solutions to the problems or is it something else entirely? One participant stated that they like VM made about important people in history, such as *Hidden Figures* (2016), which tells the story of a group of African-American female mathematicians in the early N.A.S.A. (National Aeronautics and Space Administration) program as the space race begins. They wondered if there were films with a similar filmmaking style in the form of biographic or autobiographic that *"focus on climate activities or environmental activism,"* and if they would be popular because they personally find them interesting and informative. An additional participant mentioned that they would prefer VM focus on *"what communities are already doing or have been doing for a long time that are being disrupted by colonial, globalization, business, or religious structures."* This participant would like to see things that marginalized and indigenous communities are and have been doing for a long time. For example, showing more traditional ecological knowledge (TEK) within forest management, and how it applies to other small communities elsewhere around the world. Multiple participants expressed a focus on place-based and local issues as providing a super useful narrative. One participant suggested showing the effects of banning single-use plastic bags on a local community and the benefits of using metal straws to help the environment. In addition, another participant provided an example of the ancient technology used in Aztec society to make their ground more fertile, as a local example to Mexican communities. The same participant also recommended *"changing the avenues from cable or streaming services to make it easier for smaller content creators to have more buy-in to the topic,"* such as the use of more social platforms

like TikTok. To which one participant asked why radio and newsletters do not count as VM, as they often get local environmental stories from these media. I stated that it is because they do not always have visual video elements.

One final supplemental question was asked about the social media aspect of VM, based on it being a recurring theme throughout the discussion. The question was along the lines of, given the current trend of social media, particularly short-form videos, participants were asked whether they would prefer environmental VMs in the form of TikTok Posts, Instagram Reels, YouTube Shorts, three-minute trailers, or whether they would prefer a longer format, such as the entire one to two-hour-plus VM. One participant brought up that they believe good communicators can share their knowledge in no more than a 15-minute timeframe. Another participant agreed that they prefer short clips and emphasized that they would watch environmental short films, like those shown at the Portland Hollywood Theater, but not an entire VM. This is where the discussion ended and things were wrapped up. Based on my initial qualitative analysis, upon leaving the room, I felt like most people left the room feeling a sense of doom-and-gloom. This could have been due to the VM creating a lack of hope or this could have been the poor weather Oregon had been experiencing for the past few months.

4. DISCUSSION

4.1. Summary of Findings

Filmmakers often attempt to impart a sense of responsibility to their audience (Breviglieri & Sol Osório, 2020), based on these results, not only did my participants feel a sense of responsibility, but they felt negative emotions. This research study aimed to address four main questions to better understand how environmental VM can be enhanced. Regarding the first research question, the most influential environmental VM topic that participants were made aware

of is climate change (***Table 1***). This finding supports my initial hypothesis and serves as the rationale for selecting climate change as the primary VM topic focus of this study.

The second question examined the impact of different genres of environmental VM on the emotional responses of participants. To address this question, both verbal qualitative discussions and questionnaires were analyzed. The results of this study supported the hypotheses that the VM trailers presented factual and scientifically accurate information, and overall left participants in a negative emotional state. The negative emotional states that VM elicited were further supported by the quantitative results (***Figure 1***), which revealed that the trailers often evoked feelings of doom-and-gloom among participants and left them unsure about how they could contribute to a solution. Additionally, participants stated that seventeen out of eighteen of the selected adjectives were on the negative emotional spectrum, with feelings of being unimpressed, angered, depressed, and alarmed being a common thread further supporting the negative trend (***Table 4***). The trend is further supported by the fact that the majority of one-word adjectives used to describe their emotional state after each trailer were negative. However, the scientifically accurate information part of the hypothesis yielded mixed quantitative results, as indicated in ***Table 2***, demonstrating both success in educating participants and increasing environmental awareness, depending on whether you consider the first time or second time the questions were asked.

In addition, while some participants expressed that, their motivation for pursuing environmental topics stemmed from VM, they were unimpressed with the VM as they desired local-related topics, discussions about solutions, and innovative presentation approaches. While my hypothesis that *DLU*, would be the most positive, did not end up being supported as the most positive emotional response trailer, within ***Figure 1***, the most positive was *CI* with an overall average negative total emotional reaction of -5.3. *CI* being the most positively received trailer

came as a surprise to me as I assumed that participants might find this trailer boring, especially considering they initially had negative perceptions. However, *YOLD* and *DLU* did elicit a high emotional response as depicted in ***Table 3***, while *CI* did not. This discrepancy could be attributed to participants' frustration with these VMs and *CI*'s artistic presentation of environmental degradation, which may have led participants into a trance state. Moreover, after watching the more dramatized versions of *YOLD* and *DLU*, the participants seemed to enjoy the more original truth-based storytelling in the *CI* documentary. Participants seem to cite that despite its negative moments, *CI* was much better at capturing the scientific effects of climate change, whereas the others seemed like celebrity endeavors with climate change as a sub-topic. In addition, I was surprised that participants did not like *DLU* as much as I did, as I think it does an excellent job of explaining how poorly humanity is acting toward climate change and communicating this global issue. However, it is worth considering that these participants might be experiencing fatigue or *"desensitization"* towards this narrative, as it has been expressed numerous times by VM researchers.

Regarding the third question about the effectiveness of environmental VM in promoting awareness and inspiring action toward addressing environmental issues, most participants expressed the belief that it was only somewhat effective or slightly effective, depending on the timeframe considered (***Table 2***). However, the findings from the verbal discussions further support this perception. As illustrated in statements about climate change, such as, *"Not something that I have a personal stake in, even though I know it's a large global issue."* Or, *"Hollywood keeps on making these artsy metaphors to look at climate change, but I wish for a direct call to action."* Or even, viewers are *"...just going to watch the movie and move on,"* which highlights participants' desire for more direct and actionable content. Participants felt that many environmental VMs

lacked the ability to drive action-oriented outcomes, resulting in viewers simply moving on after watching the movie.

Before proceeding, one participant raised an argument that *DLU* was a poorly written script. It seemed that the participant was making a general statement about mainstream narrative films rather than specifically targeting environmental VM. This was the same participant, who responded to the questionnaire that they do not actively seek out or have a particular interest in environmental VM. Instead, they appeared to prefer written and audio content, such as radio, podcasts, and newsletters. Based on this, in hindsight, I regret not asking for clarification on why they perceived it as poorly written and not seeking more substantive feedback, or even asking why they may enjoy written or audio content better than visual content. I also regret not asking participants, especially this participant, whether they believe scientific articles are currently presented in a conducive manner for the effective communication of science knowledge to the general public. As I personally, found the *DLU* script to be well-written, entertaining, and successful in indirectly highlighting the issue of humanity's unwillingness to address climate change, sometimes more effectively than that of peer-reviewed articles. Nevertheless, I value their perspective, and it begs the question of whether the film arrived a decade too late. Overall, I think the research was still a worthwhile endeavor. Lastly, while I do not disagree with the fact that these trailers failed in many ways, I commend the creators of these VMs for each trying something new and being at the cutting edge of their respective VM genre, with *CI* being one of the first films to document long timescale global change, *YOLD* embarking on a mission to introduce climate change to a broad audience, and *DLU* taking a satirical perspective on the climate change issue by trying to tell the viewer, Do Look Up!

While none of these findings are extremely surprising, they align with the observations of other scholars (Lowe et al., 2006; Register, 2019; Bieniek-Tobasco et al., 2019) and numerous researchers in the field as scholars have noted that environmental VM can effectively present information in informative ways. However, it is important to recognize that this does not necessarily result in immediate action but rather tends to evoke negative emotional states. Nonetheless, this study aims to explore potential solutions to address these findings and their implications. Based on this idea and findings from the three previous questions, the fourth and final question aimed to explore potential improvements for environmental VM, to mitigate negative emotions and make the VM more actionable. Participants were seeking something different, such as providing solutions, for a fresh perspective, on this so often negative environmental topic. A potential solution to VM issues is presented in extensive detail in the following seven-part plan.

4.2. The Seven-Part Plan

In light of the results and knowledge gained from this research study, such as the overall negative emotional state, the lack of action, and the overall disliking of most of the VM, I have come up with a seven-part plan to remove the doom-and-gloom negative narrative from VM. The plan synthesizes the knowledge of this research and incorporates additional relevant research to propose a potential solution. While the plan does not encompass the entire solution to the problem, it does begin to look for solutions. Therefore, the plan looks to move beyond the doom-and-gloom narrative, and instead toward changing the narrative to one that is more positive and results in action. To summarize the plan: 1) filmmakers and scientists need to media frame a narrative including having a focused environmental topic, 2) need to work on VM to promote more action-oriented and solution rhetoric strategies, 3) make the stories local, 4) look into exploring different

genres of film like a biographic type, 5) reframe the issue in a nonpartisan way to allow the most impact, 6) look into making VM presentations shorter, and 7) provide more funding to emerging filmmakers. The seven-part plan is summarized in the following conceptual diagram, *Figure 2*. It is important to note that the seven-part plan is not cyclical in nature and its components overlap. It is a plan where pieces from the diagram are taken and used. Therefore, creators should try their best to utilize as many of these pieces as they can to create a new, more positive, and solution-oriented environmental VM. The plan is discussed in more detail in the following section:

Figure 2. The seven-part plan aims to enhance and improve environmental visual media by providing a new, positive, and solution-oriented narrative.

First, to meet the goal of changing people's perceptions and emotions, when presenting scientific information, filmmakers and scientists need to develop a compelling storyline or narrative arc that pulls the viewer into the story moving them through the narrative journey, which could include media framing. While the concept of media framing could be applied to multiple parts within this plan, the specific aspect of media framing, as examined by Basseches et al. (2022), allows VM creators to tailor their content to a particular audience, making that target audience

their primary focus. Based on this, I recommend that filmmakers and scientists examine planning

or even marketing the films, with a specific topic and audience in mind like those found in *Table

1*. For example, consider a climate change topic concerning forest fires in the Pacific Northwest

(PNW), while making an effort to maintain a positive outlook. Therefore, the VM creator needs to

have a deep understanding of the environmental issue they want to address, ensuring that the

information provided is not only accurate but also informative. Additionally, creators should even

address environmental issues that have been less influential in the audience's awareness, such as

environmental management and policy (*Table 1*), as opposed to topics like climate change that

have been extensively covered within environmental VM. Creating more VM content around these

issues would spark more conversation and awareness. Alternately, I would even suggest

filmmakers explore and discuss an environmental topic, not focus on the environmental issue itself

but rather approach it as a film about something non-environmentally related (e.g., technology,

dogs, etc.) with an environmental sub-theme; for example, a dog's journey across a forest fire torn

community. Or, the creator could showcase the inherent beauty of nature itself by capturing

stunning landscapes, unique biomes and ecosystems, and the vast biodiversity through high-

quality videos, images, aerial shots, time-lapse, and amazing sound design. These approaches to

media framing could aim to gain support from individuals who are not inclined to watch

environmental content and may have a negative outlook on climate change. It involves framing

the media in a specific way that makes it more appealing to a wider audience by also making it

eye-catching. This can be achieved by presenting the issues in a positive light, focusing on a

specific environmental topic, or framing the issue not solely as an environmental concern but also

as a sub-theme issue. The possibilities for creators to explore are endless. Finding one media

framing technique that works for multiple people would be a challenging task but it might involve using multiple parts or phases within this plan.

Second, while I understand, making action-oriented and solution-oriented rhetoric (Foust & Murphy, 2009) is a challenging task, especially when you try to present the topic in a nonpartisan manner, this shift needs to be made. Having said that, I understand that VM is not a 'one-size-fits-all solution.' However, I firmly believe that as society tackles climate change, it becomes increasingly important to utilize VM as a means of communication solutions. Solutions have been demonstrated to be an effective tool in addressing environmental issues (Hart & Feldman, 2016). Therefore, to reach a wider audience and foster greater engagement, filmmakers and scientists must prioritize the creation of excellent VM content by effectively leveraging it in coherent and impactful ways. Through investing in quality and effective solution-based VM content, filmmakers and scientists can connect with more people and inspire them to take action, encouraging greater consumption of VM content and empowering individuals to actively address climate change. For example, can filmmakers and scientists portray environmental issues in a more positive light, by showing all the good things humans have done to enact environmental change, and how we are slowly beginning to change people's perceptions of environmental issues? As an illustration, the idea of seaweed farming proposed by one participant, or the countless other solutions that humankind has thought of, can be brought forth. As one of the most crucial parts of the VM content creation process is encouraging viewers to take action, a few ways to achieve this could include but are not limited to, including clear calls-to-action in your visual media. This can involve providing links to relevant resources, campaigns, or opportunities for involvement, such as signing petitions or supporting environmental organizations. Lastly, while it is true that we all bear varying degrees of responsibility for the climate crisis, we must focus on actionable solutions to

collaboratively address the issue and reach a win-win outcome for all involved, by creating this action-oriented and solution-based content we could be to take accountability as humans. Filmmakers and scientists, when creating VM, play a vital role in engaging and mobilizing people towards concrete actions for combating climate change. They could achieve this by reminding viewers to remain optimistic about the future and by highlighting the progress made in public opinion, policy, and technology.

Third, another reframing that needs to occur is presenting local communities issues, while it is often nice to present a topic as a broad issue, and while I believe there are advantages to a broad focus, focusing on local issues could also be useful. For example, the environmental justice issues occurring in a community and how they are being solved or the effect heat waves have caused on a local community and solutions to mitigate and adaptively manage these events. Research conducted by Cheng & Gonzales-Ramirez (2021) has highlighted the significance of local context in promoting environmental awareness and action. Furthermore, as some of my participants pointed out, expanding the focus of the documentary beyond Western issues and white American communities could be extremely beneficial. For example, looking at TEK practices by tribes in the PNW. By highlighting the experiences of historically marginalized communities and the issues they face, the VM could become more inclusive and relevant to a wider audience, potentially increasing its impact. However, to achieve this, it is important to focus on local issues that affect BIPOC communities. Covering these topics in the VM could provide greater representation and shed light on important issues that are often overlooked in mainstream media. In addition, including ordinary people (i.e., not celebrities) taking small mindful actions to contribute to a more sustainable future could be useful when framing environmental problems for

more effective VM. Additionally, by making environmental VM locally relevant, it has the potential to gather more local support.

Fourth, reframing the issue to be nonpartisan (McDonald, 2009) is no simple matter as unbiased filming is complex. While climate change remains an exceptionally controversial and polarizing topic that has created divisions in various aspects of society, from politics to religion (Kennedy et al., 2022; Dunlap et al., 2001), framing the issue in a nonpartisan way might be the solution to this problem. Framing the issue in a nonpartisan manner could involve showcasing data and statistics in the VM to provide evidence and support for your message, or even not showing the data but showing both sides of the story. Nonetheless, it is important to present the information in a visually appealing and easy-to-understand format, such as with infographics or data visualizations, that remains unbiased but educational. However, with careful consideration being paid to all parties, I think it could be accomplished. Moreover, even if it cannot be nonpartisan, trying to make multiple films to meet different demographics (e.g., including more BIPOC, and multiple religious or political beliefs) could be a solution, which I discuss in the next section. Nevertheless, I understand that the techniques for creating a science, nature, or environmental film that effectively evokes solutions, hope, and agency, while maintaining an unbiased and nonpartisan approach, can be quite complex. This complexity is further heightened for documentarians who strive to present their films as close to reality as possible.

Fifth, I also recommend that filmmakers and scientists explore different genres of film such as a biographic type of film like *Dark Waters* (2019), *The Immortal Life of Henrietta Lacks* (2017), or cartoons, which will be discussed later. For example, *Dark Waters* lays out a legal defense case involving an environmental lawsuit against the chemical company DuPont de Nemours, Inc. (DuPont), who have been leaching perfluorooctanoic acid (PFOA) in the manufacturing of their

Teflon products. This film is an excellent example of combining science with drama, such that someone could make a biographic film or TV series about Rachel Carson highlighting the challenges of having women in science and the effect she had on the environmental movement. Or even a film about the first earth day. Or even exploring issues related to decolonizing human consciousness by transforming systems of exploitation and addressing environmental racism, in order to foster ecological justice and sustainability. Alternatively, one could research and tell the story of the success of individuals, communities, and organizations by highlighting their achievements. The ideas of various new plots and genres of VM are countless. Furthermore, drawing on my past fifteen-plus years of watching, and consuming environmental VM, I would like filmmakers, directors, and scientists to explore implementing a single storyboarded narrative across four-plus genres of environmental VM. Perhaps, this could include creating four plus different genres (e.g., documentary, television style, narrative film, and cartoon) of a single narrative. For each of the four genres, the filmmaker could then create multiple trailers for different media framing and/or demographics (e.g., BIPOC, religious or political ideologies, etc.). For example, create three trailers for each genre, one that is positive, one that is negative, and one that is in-between, resulting in twelve total trailers across multiple genres, to determine which film trailer is most effective at eliciting the biggest positive emotional and action-driven responses. While the use of binaries, such as positive and negative, and everything in between, is just one example, this concept could be applied to various aspects, including religion and political structures. Another idea would be to utilize an environmental topic to create environmental VM across various genres and target different audience demographics. This could involve producing a longer-form documentary piece or mainstream narrative film aimed at older and middle-aged audiences. Additionally, TV coverage on local news can be tailored to target adults, while short

YouTube clips can be created to engage younger audiences and teenagers. Lastly, educational thirty-second commercials can be designed specifically for children viewers. Creating a diverse range of genres, including twelve or more different types of trailers tailored to various media framing and demographics, would hopefully attract a broader audience and encourage engagement by employing multiple genres of communication.

Six, while I personally am not a huge fan of short format VM, I think the focus group made an excellent point about VM media often being too long. In the case of short VM, while I am not the audience for short clips, I know that many young adults consume lots of short format VM. Therefore, filmmakers and scientists must have a clear vision, know the audience they want to target, develop a plan, set of goals, and have a clear take-home message tailored to the specific target audience as critical to developing and guiding a filmmaker and scientist toward creating a compelling film (Nelson & Bertalan, 2015). Having a clear and concise message might enable creators to avoid using complex scientific terminology or jargon that could confuse or leave viewers feeling hopeless or unable to take action. With this plan a filmmaker and scientist, should know their audience; are they trying to tell a story to a young audience who loves short format? Or, are they trying to tell a story to an older audience who enjoys longer stories? Alternatively, can filmmakers even create multiple stories for multiple platforms? For instance, there could be both short and long formats of the VM, to effectively tell their story, by creating multiple versions. Optimizing the video in different formats, including short formats, allows creators to effectively target specific audiences on social media, websites, and even through streaming or cable coverage.

Seven, while the field of environmental VM has grown, becoming a filmmaker has become more and more challenging and competitive as "…funding sources have been getting progressively more limited, making it difficult if not impossible for documentary filmmakers to make a living

while plying their trade" (Duvall, 2017). Scientific research is often funded by massive grants. Why are more filmmakers not funded by government grants? On the other hand, why are scientists not given any incentives to collaborate with filmmakers or by themselves to make their academic and scholarly papers into VM? I would like to see more working collaboration between scientists, filmmakers, policymakers, non-governmental organizations (NGOs), and all others who can help create a compelling visual narrative. This collaboration is critical as there is a disconnect between science and VM, collaboration can in turn amplify the public uncertainty around the topic of climate change (Cheng & Gonzales-Ramirez, 2021). Furthermore, adding this collaboration would lend a sense of credibility to an often-polarizing topic. As a result, providing additional funding to scientists and/or environmental VM creators could lead to a broader impact on the communication of scientific information.

4.3. Limitation & Future Research

Just as any study has, this study has its limitations. The first major limitation was I was unable to randomize the VM. While I chose to display the VM based on the years they came out, I recommend that future studies have six focus groups and each film is randomly shown in various order. In addition, to reduce potential influence on one another, I recommend that instead of showing the trailers during the focus group that they are shown individually to participants. Then a short interview would be conducted on an individual basis. One week later, a follow-up focus group would be conducted, in which discussion occurs with a larger group to create collaboration and to bounce ideas off each other, allowing for further reflection than a short two-hour study could provide and hopefully, this format would elicit more back-and-forth conversation.

Moreover, I recommend rather than choosing two documentaries, in my case *CI* and *YOLD*, you select a TV Series, that is more of a narrative or drama TV series, more similar to

Extrapolations (2023). *Extrapolations* is a new drama TV series that hopes to find the middle ground of educational, informative, entertaining, and presents climate change as a current issue rather than a future issue (Osaka, 2023; Veltman, 2023). On that note, I would recommend selecting a VM from the same year. As I mentioned earlier, I found *CI* to be outdated and did not have the fast pace of documentaries you get in today's world, and this could have had an effect on the participants' reactions.

Additionally, while I believe that my participant pool was engaged in the conversation, my main recommendation for future work on this topic is to include a larger number of participants with greater educational diversity, a wider gender range, a broader age range, and more diverse socioeconomic, racial, ethnic, geographic, political, and religious backgrounds. Expanding the demographic scope is critical, particularly considering that geographic location, political affiliation, and educational background can significantly influence beliefs about climate change (Ingram, 2014). For example, this research study was conducted on college-educated students, and studies by Czarnek et al. (2021) have shown a correlation between educational background and climate change beliefs. Furthermore, one of the goals of this study was to enhance the accessibility of scientific topics like climate change for a broader audience through VM. However, conducting this study within an academic setting presents challenges in terms of making it accessible to a broader audience, particularly because not everyone has the opportunity to attend college due to the barriers to entry. Therefore, if this study aims to reach a wider audience, it is crucial to include participants from outside academia to make the climate topic more accessible. Similarly, to increase the demographic pool, I would broaden the focus group to represent a larger sample size of the United States of America population, rather than just the small PSU ESM student body, who may have been *"desensitized"* to the topic of climate change. This could be done by making this

an online questionnaire rather than an in-person questionnaire with discussion. Furthermore, future research could focus on those who do not view much VM and those who do not believe in climate change, and figure out ways to get more people to either believe or want to make changes, who are not already doing so, which is far different than those in my focus group.

Equally important to expanding the demographic participants in this study is increasing the size of participants in this study, as the statistical power of the current study is limited. ***Table 2*** highlights this as evidence. Participants prior to watching the trailers said that VM is very effective at increasing environmental and scientific awareness of a particular issue and educating viewers about a particular issue; however, when asked this a second time after watching the trailers, the number decreased by more than half from very effective to only somewhat effective after watching the trailers. This change in response is particularly interesting and noteworthy, but due to my small sample size, it is hard to say if this was due to random chance or if there is a statistically significant difference in the values. Hence, no p-values were reported or tested due to the limited sample size in the dataset, which could potentially lead to Type I errors (false positives) and/or Type II errors (false negatives). Consequently, although I was aware that the statistical power of my results would be limited by the small sample size, due to time and budget constraints, it was not feasible to have a larger sample size and was beyond the scope of the research. Nevertheless, if these limiting constraints were not present, I would recommend future work expanding the scope of this research project to examine questions similar to those outlined in ***Table 2***.

In addition, I suggest that future research consider expanding the scope of this research by adding more genres. For this, I, as well as others (O'Neill & Smith, 2014), suggest more genres be compared, such as cartoons explored by Caraway & Caraway (2020) like Pixar's *WALL-E* (2008) or Universal Pictures' *The Lorax* (2012) or even 20th Century Fox's *Ice Age 2: The Meltdown*

(2006) explored by Moore (2015) or Disney's *Frozen* (2013) explored by Sebring (2021). Even the animated series *Captain Planet and the Planeteers* (1990 to 1996), which revolves around environmental themes, has been discussed as a potential candidate for adaptation into a mainstream film, with involvement from DiCaprio and others (Ford & Kit, 2016). This older animated series could be explored or even compared to a modern cartoon. Adding the cartoon genre would further expand the range and comparison of genres examined, in this study only including documentaries, TV series, and narrative films. Additionally, I would recommend using a radar chart to quantify the seven-part plan for each genre to figure out which blueprint of components (radii) would create the ideal VM. The implementation of a new genre combined with a radar chart would open up possibilities for future research in this field, and allow for the quantification of a new, positive, and more solution-oriented environmental VM.

Alternatively, this research could be expanded to compare additional forms of communication. For instance, Reading F.C. (Football Club) took an interesting approach to promoting climate change awareness by using red and blue striped sleeve kits to represent the average annual temperature of the climate during the 2022 season (Boudway, 2022) or the Adidas Parley Major League Soccer (M.L.S.) 2023 environmental kits they try to use once a year around Earth Day. This leads to the question of whether such kits could effectively communicate the urgency of the climate change situation, and how they compare to the impact of VM. Beyond the scope of this study, I also suggest that the filmmaking industry be examined further to explore the impact of filmmaking on the environment (Flanigan, 2002; Maxwell & Miller, 2012; Vaughan, 2019), as this seems to be an under-researched area. Examining and expanding this research allows others to leverage the ideas, limitations, and future research presented in this study, with the

ultimate goal of empowering filmmakers and scientists to create a better and more compelling VM while mitigating limitations.

4.4. Conclusion

If more VM followed this seven-part plan, I believe that VM could be made more effective and efficient, ultimately resulting in a stronger impact. Although this study cannot definitively establish the impact of these three VMs on the wider public, it is worth noting that *CI* effectively communicated the reality of climate change through the use of powerful photographs, *YOLD* utilized celebrities and scientists to inform the general public about climate change, and *DLU* took a unique approach to the issue by employing satire comedy about an often depressing topic. In many ways, this research report emphasizes that the process of filmmaking is hard, no two films are exactly alike, and there is no set script to follow. Filmmakers may have chosen to portray their VM in one way, but it came across another way due to a particular person's upbringing or other beliefs. With more expansive research I believe scientists and filmmakers, could begin to address the VM genre that works best for eliciting the positive emotional state and most action. With these seven-parts and following classic storytelling, I believe filmmakers and scientists could tap into humankind's love for patterns and storytelling to create a profound impact on moving people toward changing emotional beliefs and actions. Simply put, stories that provide a positive response and demonstrable solutions will resonate more and can therefore create or motivate action. I believe that if filmmakers were to create VMs that present environmental and scientific information in a narrative journey VM format, they could potentially tap into human consciousness and elicit a change in environmental issues. This format when combined with my seven-part plan could help garner a larger audience and make the information more accessible and engaging, leading to a greater impact on environmental awareness and action.

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6. **CONFLICT OF INTEREST**

The author declares no potential conflict of interest with respect to the research, authorship, and/or publication of this thesis.

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8. APPENDIX

8.1. Appendix 1. Focus Group Questionnaire & Discussion Questions

Below are the questions that you will be completing during this study. If you have any questions while completing the questionnaire, please feel free to raise your hand.

<u>Demographic Questions:</u> *If you do not feel comfortable answering questions three (3) to nine (9) in this section feel free to skip any of those questions and write, PNTA (Prefer Not To Answer).*

1. What is your major(s) and/or minor(s)? *(select all that apply)*
   - ❑ Environmental Science Major
   - ❑ Environmental Studies Major
   - ❑ Other Major(s) and/or Minor(s):

   _____
   - ❑ Environmental Science Minor
   - ❑ Sustainability Minor
   - ❑ Climate Change Science & Adaptation Minor

2. What year student are you? *(select the option that best describes you)*
   - ❑ Freshman
   - ❑ Sophomore
   - ❑ Junior
   - ❑ Senior
   - ❑ Post-baccalaureate
   - ❑ Graduate

3. What gender do you identify as? *(select the option that best describes you)*
   - ❑ Male
   - ❑ Female
   - ❑ Other

4. What year were you born?
   - Year: _____

5. Socioeconomic status is sometimes described as a combination of income and intergenerational wealth. Based on that definition, how would you rate your socioeconomic status at present?
   - ❑ High
   - ❑ Medium
   - ❑ Low
   - ❑ Unsure

6. How do you describe your race and/or ethnicity?
   - _____

7. What region did you grow up in? *(select the option that best describes you)*
   - ❑ West Coast
   - ❑ East Coast
   - ❑ Midwest
   - ❑ South
   - ❑ International
   - ❑ Other (Specify): _____

8. Which of the following matches your political ideology? *(select the option that best describes you)*
   - ❑ Strongly Conservative
   - ❑ Moderately Conservative
   - ❑ Neither Conservative Nor Liberal
   - ❑ Moderately Liberal
   - ❑ Strongly Liberal
   - ❑ Other (Specify): _____

9. Which of the following matches your religious beliefs or ideology? *(select the option that best describes you)*
   - ❑ Strongly Religious
   - ❑ Moderately Religious
   - ❑ Slightly Religious or Spiritual
   - ❑ Not Religious

Visual Media (VM) Questions:

1. When consuming visual media, how often do you use the following modes or devices? *(for each select the best answer)*

Visual Media	Always	Very Often	Sometimes	Rarely	Never
Laptop	○	○	○	○	○
Mobile Device	○	○	○	○	○
Television *(e.g., Flat Screen)*	○	○	○	○	○
Theaters	○	○	○	○	○

Other (Specify): _____

2. When consuming visual media, how often do you use the following platforms? *(for each select the best answer)*

Platform	Always	Very Often	Sometimes	Rarely	Never
Streaming Service *(e.g., Netflix, Prime Video, Hulu, Disney+, HBO, Apple TV+, Roku, etc.)*	○	○	○	○	○
Cable Television *(e.g., National Geographic, Discovery Channel, History Channel, Animal Planet, NBC, ABC, CNN, etc.)*	○	○	○	○	○
Social Media *(e.g., Facebook, Instagram, Twitter, Snapchat, TikTok, etc.)*	○	○	○	○	○
YouTube	○	○	○	○	○
Physical Disk *(e.g., DVD, Blu-ray)*	○	○	○	○	○
In-theater	○	○	○	○	○
Screening Event *(e.g., Film Festival)*	○	○	○	○	○

Other (Specify): _____

3. Which of the following frequencies describes how often you consume environmentally related visual media? *(select one)*

   ❑ Daily   ❑ Weekly   ❑ Monthly   ❑ Yearly

4. Would you describe yourself as someone who seeks out or is particularly interested in environmentally related visual media? *(select one)*

   ❑ Yes   ❑ No

5. When consuming environmentally related visual media, how often do you consume the following genres or forms? *(for each select the best answer)*

Visual Media	Always	Very Often	Sometimes	Rarely	Never
Documentary Film	○	○	○	○	○
Mainstream Hollywood Narrative Future Film	○	○	○	○	○
Social Media	○	○	○	○	○
Television (TV) Series or Shows	○	○	○	○	○

Other (Specify): _____

6. List up to three names of environmentally related visual media that you have seen. If you cannot remember the name, note the general idea or topic of the environmentally related visual media.

- _____

- _____

- _____

7. How influential has environmentally related visual media been to your awareness of the following environmental issues? *(for each select the best answer)*

Environmental Issue	Extremely Influential	Very Influential	Somewhat Influential	Slightly Influential	Not At All Influential
Activism & Communities	○	○	○	○	○
Anthropocene	○	○	○	○	○
Climate Change	○	○	○	○	○
Environmental Justice	○	○	○	○	○
Environmental Management	○	○	○	○	○
Environmental Policy	○	○	○	○	○
Food & Water	○	○	○	○	○
Fossil Fuel & Oil Depletion	○	○	○	○	○
Industry *(e.g., Electronic, Plastic, Apparel)*	○	○	○	○	○
Loss of Habitat	○	○	○	○	○
Pollution & Toxic Waste	○	○	○	○	○
Species Extinction	○	○	○	○	○

Other (Specify, describe in no more than four words): _____

8. Of the environmental issues listed in the table above, which one concerns you the most? *(list one)*

- _____

9. How much do you agree or disagree that we are too late to do anything about climate change? *(select one)*

❒ Strongly Agree   ❒ Agree   ❒ Neither Agree Nor Disagree   ❒ Disagree   ❒ Strongly Disagree

10. How effective is environmentally related visual media in the following? *(for each select the best answer)*

Statement	Extremely Effective	Very Effective	Somewhat Effective	Slightly Effective	Not At All Effective
Increasing environmental and scientific awareness of a particular issue	○	○	○	○	○
Educating viewers about a particular issue	○	○	○	○	○
Generating action around an issue	○	○	○	○	○
Making you want to change your lifestyle	○	○	○	○	○
Prompting an emotional response	○	○	○	○	○

11. *Discussion Question(s):* What is a major environmental concern and/or issue that you have been made aware of from environmentally related visual media? Why is it of concern, and was it from a particular genre (e.g., documentary, television, mainstream film, etc.)?

We will discuss this question out loud, but feel free to take notes prior to the discussion:

Trailer #1 Questions:

Pre-Viewing Questions: Documentary Film: *Chasing Ice* [*CI*] (2012)

1. Have you seen the documentary film or trailer *Chasing Ice* (2012)?
   ❒ Yes   ❒ No   ❒ Unsure

   → 2. If you answered <u>Yes</u> to Question 1, did you watch the entire film or just a trailer?
      ❒ Film   ❒ Trailer

   3. Do you remember why you choose to watch the documentary film or trailer? *(limit to one sentence; if unsure write N/A)*
      • _____

   4. What do you remember about the documentary film or trailer? *(limit to one sentence; if unsure write N/A)*
      • _____

   5. Did the documentary film or trailer change your opinion about anything or affect you in any way? *(limit to one sentence; if unsure write N/A)*
      • _____

Post-Viewing Questions:

1. Did you like the documentary film trailer for *Chasing Ice* (2012)?
   ❒ Yes   ❒ No   ❒ Unsure

2. Based on the trailer what do you think the *Chasing Ice* documentary film is about? *(one sentence)*

   • _____

3. After watching the *Chasing Ice* trailer, which adjectives describe your emotional reactions? *(for each select the best answer)*

Emotional Adjective	Strongly	Moderately	Slightly	Neither	Slightly	Moderately	Strongly	Emotional Adjective
Amazed	○	○	○	○	○	○	○	Unimpressed
Calm	○	○	○	○	○	○	○	Anxious
Cheerful	○	○	○	○	○	○	○	Depressed
Enlightened	○	○	○	○	○	○	○	Skeptical
Hilarious	○	○	○	○	○	○	○	Humorless
Hopeful	○	○	○	○	○	○	○	Hopeless
Inspired	○	○	○	○	○	○	○	Discouraged
Light	○	○	○	○	○	○	○	Dark
Motivated	○	○	○	○	○	○	○	Powerless
Optimistic	○	○	○	○	○	○	○	Disheartened
Pleased	○	○	○	○	○	○	○	Angered
Positive	○	○	○	○	○	○	○	Negative
Reassured	○	○	○	○	○	○	○	Alarmed
Uplifted	○	○	○	○	○	○	○	Despair

Other (Specify, describe in no more than four words): _____

Other (Specify, describe in no more than four words): _____

Other (Specify, describe in no more than four words): _____

4. Which of the above emotional adjectives best fits your current emotional state after watching the *Chasing Ice* trailer? *(list one)*

   • _____

5. Are you likely to watch the entire documentary in the next three months after watching this trailer?
   ❒ Yes   ❒ No   ❒ Maybe

6. *Discussion Question:* After watching the *Chasing Ice* trailer, what emotional state did the trailer leave you in and why?

   We will discuss this question out loud, but feel free to take notes prior to the discussion:

Trailer #2 Questions:

Pre-Viewing Questions: TV Series: *Years of Living Dangerously* [*YOLD*] (2014)

1. Have you seen either the TV series or trailer for Season 1 or 2 of *YOLD* (2014, 2016)?
   - ❒ Yes ❒ No ❒ Unsure

   → **2.** If you answered <u>Yes</u> to Question 1, did you watch the entire TV series [or episode(s)] or just a trailer?
      - ❒ TV series [or episode(s)] ❒ Trailer

   3. Do you remember why you choose to watch the TV series [or episode(s)] or trailer? *(limit to one sentence; if unsure write N/A)*
      - _____

   4. What do you remember about the TV series [or episode(s)] or trailer? *(limit to one sentence; if unsure write N/A)*
      - _____

   5. Did the TV series [or episode(s)] or trailer change your opinion about anything or affect you in any way? *(limit to one sentence; if unsure write N/A)*
      - _____

Post-Viewing Questions:

1. Did you like the TV series trailer for Season 1 *Years of Living Dangerously* [*YOLD*] (2014)?
   - ❒ Yes ❒ No ❒ Unsure

2. Based on the trailer what do you think the Season 1 *YOLD* TV series is about? *(one sentence)*

   - _____

3. After watching the *YOLD* trailer, which adjectives describe your emotional reactions? *(for each select the best answer)*

Emotional Adjective	Strongly	Moderately	Slightly	Neither	Slightly	Moderately	Strongly	Emotional Adjective
Amazed	○	○	○	○	○	○	○	Unimpressed
Calm	○	○	○	○	○	○	○	Anxious
Cheerful	○	○	○	○	○	○	○	Depressed
Enlightened	○	○	○	○	○	○	○	Skeptical
Hilarious	○	○	○	○	○	○	○	Humorless
Hopeful	○	○	○	○	○	○	○	Hopeless
Inspired	○	○	○	○	○	○	○	Discouraged
Light	○	○	○	○	○	○	○	Dark
Motivated	○	○	○	○	○	○	○	Powerless
Optimistic	○	○	○	○	○	○	○	Disheartened
Pleased	○	○	○	○	○	○	○	Angered
Positive	○	○	○	○	○	○	○	Negative
Reassured	○	○	○	○	○	○	○	Alarmed
Uplifted	○	○	○	○	○	○	○	Despair

Other (Specify, describe in no more than four words): _____

Other (Specify, describe in no more than four words): _____

Other (Specify, describe in no more than four words): _____

4. Which of the above emotional adjectives best fits your current emotional state after watching the Season 1 *YOLD* trailer? *(list one)*

   - _____

5. Are you likely to watch the entire TV series [or episode(s)] in the next three months after watching this trailer?
   - ❒ Yes ❒ No ❒ Maybe

6. *Discussion Question:* After watching the *Years of Living Dangerously* trailer, what emotional state did the trailer leave you in and why?

   > *We will discuss this question out loud, but feel free to take notes prior to the discussion:*

Trailer #3 Questions:

Pre-Viewing Questions: Mainstream Hollywood Narrative Future Film: *Don't Look Up* [*DLU*] (2021)

1. Have you seen the film or trailer *Don't Look Up* (2021)?
    ❏ Yes   ❏ No   ❏ Unsure

     2. If you answered <u>Yes</u> to Question 1, did you watch the entire film or just a trailer?
    ❏ Film   ❏ Trailer

        3. Do you remember why you choose to watch the film or trailer? *(limit to one sentence; if unsure write N/A)*
    • _____

        4. What do you remember about the film or trailer? *(limit to one sentence; if unsure write N/A)*
    • _____

        5. Did the film or trailer change your opinion about anything or affect you in any way? *(limit to one sentence; if unsure write N/A)*
    • _____

Post-Viewing Questions:

1. Did you like the film trailer for *Don't Look Up* (2021)?
    ❏ Yes   ❏ No   ❏ Unsure

2. Based on the trailer what do you think the *Don't Look Up* film is about? *(one sentence)*

    • _____

3. After watching the *Don't Look Up* trailer, which adjectives describe your emotional reactions? *(for each select the best answer)*

Emotional Adjective	Strongly	Moderately	Slightly	Neither	Slightly	Moderately	Strongly	Emotional Adjective
Amazed	O	O	O	O	O	O	O	Unimpressed
Calm	O	O	O	O	O	O	O	Anxious
Cheerful	O	O	O	O	O	O	O	Depressed
Enlightened	O	O	O	O	O	O	O	Skeptical
Hilarious	O	O	O	O	O	O	O	Humorless
Hopeful	O	O	O	O	O	O	O	Hopeless
Inspired	O	O	O	O	O	O	O	Discouraged
Light	O	O	O	O	O	O	O	Dark
Motivated	O	O	O	O	O	O	O	Powerless
Optimistic	O	O	O	O	O	O	O	Disheartened
Pleased	O	O	O	O	O	O	O	Angered
Positive	O	O	O	O	O	O	O	Negative
Reassured	O	O	O	O	O	O	O	Alarmed
Uplifted	O	O	O	O	O	O	O	Despair

Other (Specify, describe in no more than four words): _____

Other (Specify, describe in no more than four words): _____

Other (Specify, describe in no more than four words): _____

4. Which of the above emotional adjectives best fits your current emotional state after watching the *Don't Look Up* trailer? *(list one)*

    • _____

5. Are you likely to watch the entire film in the next three months after watching this trailer?
    ❏ Yes   ❏ No   ❏ Maybe

6. *Discussion Question:* After watching the *Don't Look Up* trailer, what emotional state did the trailer leave you in and why?
    We will discuss this question out loud, but feel free to take notes prior to the discussion:

Reflection Questions:

1. How effective is environmentally related visual media in the following? *(for each select the best answer)*

Statement	Extremely Effective	Very Effective	Somewhat Effective	Slightly Effective	Not At All Effective
Increasing environmental and scientific awareness of a particular issue	○	○	○	○	○
Educating viewers about a particular issue	○	○	○	○	○
Generating action around an issue	○	○	○	○	○
Making you want to change your lifestyle	○	○	○	○	○
Prompting an emotional response	○	○	○	○	○

2. How much do you agree or disagree that we are too late to do anything about climate change? *(select one)*
   ☐ Strongly Agree   ☐ Agree   ☐ Neither Agree Nor Disagree   ☐ Disagree   ☐ Strongly Disagree

3. Did any of these environmental trailers change your opinion about climate change?
   ☐ Yes   ☐ No   ☐ Unsure

4. Rank the trailers, according to which one had the greatest or least emotional response. *(select each number only once)*

Trailer	Rank (1 = Greatest emotional response, 3 = Least emotional response)
Chasing Ice (2012)	
Years of Living Dangerously (2014)	
Don't Look Up (2021)	

   • What motivated your reason for Rank 1? *(one sentence)*: _____
   _____

5. Rank the trailers, according to which one most or least encouraged or motivated you to watch the entire documentary, TV series, or film. *(select each number only once)*

Trailer	Rank (1 = Most likely to watch, 3 = Least likely to watch)
Chasing Ice (2012)	
Years of Living Dangerously (2014)	
Don't Look Up (2021)	

   • What motivated your reason for Rank 1? *(one sentence)*: _____
   _____

6. Rank the trailers, according to which trailer makes you most or least want to change your lifestyle or take action. *(select each number only once)*

Trailer	Rank (1 = Most makes you want to change your lifestyle or take action, 3 = Least makes you want to change your lifestyle or take action)
Chasing Ice (2012)	
Years of Living Dangerously (2014)	
Don't Look Up (2021)	

   • What motivated your reason for Rank 1? *(one sentence)*: _____
   _____

7. Which three emotional adjectives (same as those in Question 3 of the Post-Viewing Questions) best fits your current emotional state after watching <u>all</u> three trailers? *(check no more than three)*

❑ Alarmed	❑ Depressed	❑ Hopeless	❑ Pleased
❑ Amazed	❑ Despair	❑ Humorless	❑ Positive
❑ Angered	❑ Discouraged	❑ Negative	❑ Powerless
❑ Anxious	❑ Disheartened	❑ Inspired	❑ Skeptical
❑ Calm	❑ Enlightened	❑ Light	❑ Reassured
❑ Cheerful	❑ Hilarious	❑ Motivated	❑ Unimpressed
❑ Dark	❑ Hopeful	❑ Optimistic	❑ Uplifted

❑ Other (Specify, describe in no more than four words): _____

❑ Other (Specify, describe in no more than four words): _____

❑ Other (Specify, describe in no more than four words): _____

8. If you could make a change about any of the environmental visual media trailers you watched today, what would you do differently? *(one to three sentences)*

9. How much do you agree or disagree that environmentally related visual media is often presented as doom-and-gloom? *(select one)*

❑ Strongly   ❑ Agree   ❑ Neither Agree   ❑ Disagree   ❑ Strongly
   Agree   Nor Disagree   Disagree

10. Did visual media influence your decision to go into an environmental related field?

❑ Yes   ❑ No   ❑ Unsure

You have finished the main written part of this study. Please <u>do not</u> go back and change anything written previously. You can use it for reference during the discussion if you would like, but please do not go back.

<u>Focus Group Final Discussion:</u> *If you feel comfortable doing so please go around the room and share your thoughts. NOTE: Please limit your discussion to two minutes or less. If we have more time at the end, we can open it to general questions and comments.*

Discussion Question:
1. After watching <u>all</u> three trailers, what emotional state did the three trailers leave you in and why?

> *We will discuss these questions out loud, but feel free to take notes prior to the discussion:*
>
> *Please use this space to mention any thoughts or questions that you did not have an opportunity to elaborate on:*
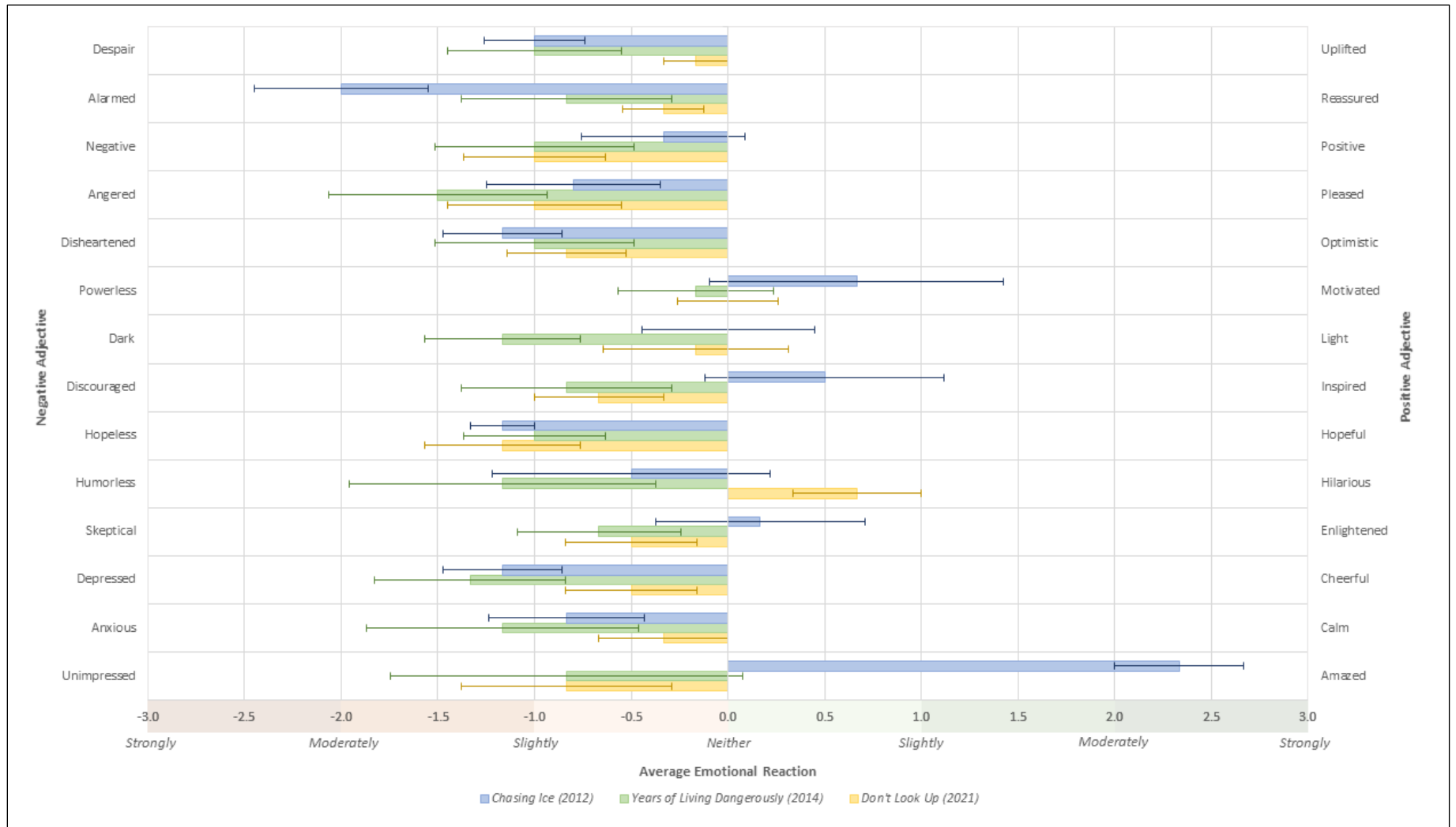
8.2. Appendix 2. Enlarged *Figure 1*

Figure 1. The average emotional reaction for all three trailers, with all trailers indicating a negative emotional total reaction based on adjectives. The data compiled to make the figure came from the following question, *"After watching the X trailer, which adjectives describe your emotional reactions?"* Where *X* represents one of the three trailers. Responses were coded as follows: strongly (-3.0), moderately (-2.0), slightly (-1.0), neither (0.0), slightly (1.0), moderately (2.0), and strongly (3.0). The error bars represent the standard error (SE) for each emotional reaction.