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Climate Change Memes to Prevent Anxious Dreams:

Using humor as a coping mechanism for climate change anxiety

University of Helsinki
Master's programme in
Environmental Change and
Global Sustainability
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Tiivistelmä - Referat - Abstract

Concern about global warming can lead to climate change anxiety, a form of anxiety characterized by excessive worry about the climate crisis and associated consequences on the natural world and human society. It has been suggested by previous research that humor can be used to manage feelings of anxiety. This study seeks to determine if this phenomenon can be applied specifically to climate change anxiety. The research combines a comprehensive literature review with an online survey that leveraged climate change themed internet memes as a proxy for humor to gather opinions about the intersections between these two topics. The survey data supplemented claims made by existing literature, indicating that climate change themed internet memes and humor in general can be useful coping mechanisms to mitigate feelings of climate anxiety. The survey was completed by 93 respondents; most of these participants were women, located in the US, and/or between the ages of 20 and 29. Results from the survey showed that people tend to feel best about their environmental anxiety when they are taking active steps to solve the problem. Conscious decisions such as reducing waste or participating in activist movements are easier to recognize and self-report than more passive coping skills. Reliance on humor was reported as a supplementary coping skill, but many respondents indicated that looking at humorous climate change themed memes did influence their feelings about climate change overall. The scope of this study was relatively small in scale, therefore the results presented in this thesis may not be indicative of broader social trends and likely require further research.

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Keywords
climate change, anxiety, humor, internet, online, memes, communication

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1 Introduction

Although parts of the planet are warming at different rates (Christensen et al., 2013), climate change remains a collective, global problem. Changes in weather patterns or sea level rise on a local level can ripple out into other regions (Christensen et al., 2013), resulting in widespread and likely long term harm to natural ecosystems and human communities (Pecl et al., 2017). The potential effects of unmitigated climate change have been particularly well documented over the years as warming temperatures have already been linked to a variety of adverse consequences (Vuorinen et al., 2017). Ecosystems will degrade (Mumby et al., 2011), species will be displaced (Pecl et al., 2017), sea levels will rise (Vuorinen et al., 2017), and uninhabitable temperatures or weather related damage will compromise the livelihoods of millions of people living in vulnerable communities (Adger et al., 2013).

These impacts are especially concerning if climate change continues progressing unchecked. Significant sociopolitical shifts aimed at minimizing the detrimental effects are necessary on an international scale to manage the problem (Vuorinen et al., 2017). While attempts to address these challenges arise frequently within scientific and political spaces, mitigation efforts remain fraught with controversy. Despite the wide body of scientific research available, there is some disagreement over whether the consequences of climate change will be severe enough to justify large scale change. Between the probable environmental damage and conflicts between policymakers trying to determine a solution, it can be agreed that climate change is a stressful matter.

Because of its existential, apocalyptic nature, even casual conversations about climate change tend to be tinged with a sense of dread. This response seems rational – climate change is an uncertain, evolving phenomenon and humans tend to respond to the unknown with feelings of apprehension or anxiety (Pihkala, 2020). Concern is to be expected. For many people, however, these feelings of climate anxiety continue after the conversation ends (Clayton, 2020). To cope, some individuals choose to avoid consciously acknowledging climate change altogether because of how poorly it makes them feel (Weintrobe, 2013). Others

experience such a strong negative emotional response to climate change that it becomes a hinderance to their daily functioning (Stewart, 2021). It can be challenging to encourage people to take positive environmental action when the mere concept is emotionally distressing.

A potential gateway to lessening climate change driven anxiety and, in turn, promoting sustainable lifestyle change, is to leverage the power of humor as a communicative tool (Morgan et al., 2019). Humor can serve as an effective way to introduce complex topics like climate change to a broad audience in an accessible manner (Brown, 2019), and to provide educational content while still meeting people where their existing understanding is at (Boykoff & Osnes, 2018).

This thesis is an exploration of climate change, associated anxieties, and the potential role of humor in communicating about climate change with the public as well as mitigating the negative emotions tied to climate change awareness. A comprehensive literature review of relevant topics is juxtaposed with a case study that leverages internet memes as a proxy for humor. Online memes serve as an interesting case study within this context because of their easily sharable nature and versatile formatting; they can be adapted to suit almost any topic (Brand, 2014). Their use is popular in online spaces to reframe serious issues like climate change in a comedic and publicly accessible way. Because of this, it stands to reason that memes could be used to cope with feelings of climate anxiety.

Some research detailing the relationship between humor and climate change does exist, however there are still knowledge gaps that need to be filled (Zhang & Pinto, 2021). Internet memes are a relatively new sociocultural phenomenon (Castaño, 2013) and their limited inclusion in academic research before the mid 2010's is reflective of their novelty. Furthermore, research published in English that directly connects internet memes and climate change attitudes is sparse at best. Coping mechanisms to manage climate anxiety have been addressed in a few recent studies (Reser et al., 2012), but the potential effectiveness of humor has been neglected. By combining this background research on climate change discourse and internet memes with public opinions on climate anxiety collected via survey, this thesis will offer a new analysis on the intersections of these topics.

2 Research Questions and Thesis Structure

This thesis explores the following questions:

- What is the nature of the relationship between humor and climate anxiety?
- What role do internet memes play in this dynamic?

This study was conducted on the assumption that there is, in fact, a relationship between humor and climate anxiety, and that some people do find comfort in using humor as a communicative tool as well as a coping mechanism. I further hypothesize that internet memes can play an important role within this dynamic; they can efficiently broaden conversations about serious topics while also offering a level of comfort, relatability, or anxiety reduction when applied to climate change discourse. Rather than seeking to provide a concrete answer to concrete questions, this study takes an exploratory approach conducted through a literature review and supplemented by survey-based content analysis methodology (Forman & Damschroder, 2007; Elo & Kyngäs, 2008).

Chapter 3, the literature review, will compile existing research on humor and climate change as well as draw connections to other relevant research within communication, environmental sciences, and social sciences. Next, Chapter 4 will explain the methodology used to design and execute this study. The data collected via online survey regarding public perceptions of humor and climate anxiety (Appendix 1) will be presented in Chapter 5. Trends that arise within these responses will be identified and interpreted in this section using content analysis strategies. This will be followed by a discussion in Chapter 6 that delves further into the broader societal implications of the existing literature and survey results. Finally, Chapter 7 will conclude the thesis, outlining potential gaps in this study and calling for further research.

3 Literature Review

This chapter compiles previous literature that connects to the goals of this study. I have divided the existing research into three categories: Climate change and eco-anxiety; Internet and memes; and Practical applications of humor.

3.1 Climate change and eco-anxiety

Climate anxiety, eco-anxiety, eco-angst, environmental neuroses, and environmental anxiety (Pihkala, 2018; Weintrobe, 2013) are just a few of the many terms used to describe similar emotional responses to modern environmental issues. Eco-anxiety is the most popular catchall term, referring generally to a chronic sense of environmental dread or fear of environmental collapse (Pihkala, 2020; Stewart, 2021). Climate anxiety is a more specific form of eco-anxiety (Pihkala, 2020), tying feelings of anxiety, stress, or fear directly to perceptions of anthropogenic climate change and its potential impacts on the world (Pihkala, 2020; Stewart, 2021). Many researchers use these terms interchangeably to reference mental health issues stemming from concern about climate change and the future of the planet (Clayton, 2020). For the sake of clarity and consistency, this paper focuses on the climate change specific dimensions of the ecological crisis and will predominantly use “climate anxiety” to describe negative emotional impacts of climate change inspired environmental concern.

Levels of climate change related stress are influenced by a multitude of factors, ranging from gender and geographical location (Peltonen, 2021) to age, vulnerability, and personality-driven predispositions (Clayton, 2020). At its core, mild anxiety over the state of the world’s climate is not an inherently inappropriate response (Clayton, 2020). Some level of anxiety is normal and necessary for humans to function; anxiety is a self-preservation tool that helps people recognize and handle potentially dangerous situations (Clayton, 2020). When this anxiety interferes with living, however, it is considered maladaptive (Clayton, 2020). The level of anxiety or distress necessary to categorize feelings of environmental worry as true eco-anxiety or climate anxiety is up for debate (Pihkala, 2020). Eco-anxiety is not yet technically considered a diagnosable clinical disorder and may

exist in tandem with other mental health concerns (Pihkala, 2020). Identifying the line between clinically significant eco-anxiety and mere environmental concern may vary on a case-by-case basis.

Dan Rubin, a “climate-aware” clinical psychologist, introduced the concept of “the Goldilocks Zone” of anxiety in a recent interview for *GenDread*, an online newsletter detailing the overlap between mental health and the modern ecological crisis (Wray, 2020). According to Rubin, the perfect balance of anxiety differs from person to person, but finding this equilibrium could allow someone to learn about environmental issues and stay engaged while ensuring that their anxiety about the situation does not interfere with their everyday life (Wray, 2020). Various psychological researchers have developed scales to measure levels of climate anxiety (Clayton & Karazsia, 2020) and help find this “Goldilocks Zone.” Older studies adapted existing psychological worry scales to suit climate change worry (Searle & Gow, 2010), while others were designed to measure the risk perception of climate change (van der Linden, 2017). Recent scales have been developed to assess cognitive-emotional impairment and functional impairment to determine the severity of climate- or eco-anxiety experienced by the participant (Stewart, 2021).

Some researchers have likened eco-anxiety to continuous cultural trauma, such as sexism or racism, in the sense that it is currently happening in the background of everyday life (Wray, 2020). In a similar vein, the tangible damages of climate change disproportionately impact already marginalized communities and can exacerbate the continuous cultural trauma they already experience (Ray, 2021). In some cases, climate anxiety may not be the primary stressor, but it can add to the layers of anxieties, worries, and problems that someone may face (Pihkala, 2020). When surveyed in the United States, Black, Indigenous, and people of color expressed higher levels of concern over climate change. Despite this, most of the conversations about climate anxiety are dominated by white voices (Ray, 2021). Climate change does not happen in a vacuum, and articles like Ray’s 2021 piece highlight how necessary it is to approach climate anxiety and climate change in an inclusive, intersectional manner.

Accessible information about climate change is a possible outlet to help influence public perception of climate change as a risk. Popular culture and news headlines commonly frame climate change as a hopeless cause, which in turn worsens anxiety (Clayton et al., 2013). Traditional scientific outlets are often inaccessible to general audiences, excluding the public from participating in the conversation (Brown, 2019). Even when they are granted access to peer-reviewed literature, elected officials, decisionmakers, and the general populace alike still tend to avoid these resources. Rather, most people gather knowledge through easily accessible media sources, conversations within their communities, and online or offline peer-to-peer experiences (Boykoff & Osnes, 2018).

3.2 Internet and memes

The origin of the word “meme” is rooted in biology, coined by Richard Dawkins in 1976 to describe “a unit of cultural transmission” (Castaño, 2013). Since then, with the advent of computer culture and the rapidly changing modern world, the concept behind the word meme has changed and its everyday usage has evolved (Shifman, 2013). Modern colloquial understanding of internet memes, hereafter interchangeably referred to as “memes,” has shifted beyond cultural transmission to incorporate the notion that memes offer information or commentary in a manner that can be inherently understood by the masses (Wu, 2013). Intertextuality refers to the tendency of memes to build upon assumed previous knowledge or understanding of existing jokes (Ayele, 2021), and it is the intertextual nature of memes that contribute to their widespread appeal (Laineste & Voolaid, 2017); The inherent humor of memes is often derived from allusions to cultural phenomena or pop culture juxtaposed with current events or other relevant themes, creating a multifaceted reference that appeals to broad audiences (Laineste & Voolaid, 2017). Figure 1 offers a recent example of an intertextual meme. The meme incorporates humor into a serious situation; by adding text to an image from the March 2021 Suez Canal blockage, the meme creator offers humorous, self-referential commentary on the intersections of meme sharing and the broader need for sustainability education.

Figure 1 *– retrieved from @gogreensavegreen on Instagram*

Popular internet memes are characterized by virality, or the ability to spread rapidly from person to person (Bauckhage, 2011). Bauckhage (2011) likens this to a large group of people being “in” on an inside joke that has potential to spread rapidly across the internet. While meme spread tends to occur in a voluntary, organic matter, some advertisers and political campaigners have appropriated common meme formats for ad campaigns to capitalize on the meme’s popularity and gain visibility for their brand in an attempt at relatability (Bauckhage, 2011). Outside of advertising, memes take many forms. Still images, clothing designs (Castaño, 2013), animated GIFs (Miltner & Highfield, 2017), catchphrases, metaphors (Wu, 2013), and image macros of text superimposed over an image to provide context (Zenner & Geeraerts, 2018) as depicted in Figure 1 are just some of the forms memes can take. Of these formats, image macros tend to be the most popular and most easily shared (Brand, 2014).

Internet memes typically rely on humor to get their message across, but this does not mean that their significance within sociopolitical or scientific conversations

should be instantly discredited. More people consume news via social media than ever before, and memes have become common frame through which to supplement as well as criticize the facts being presented (Ross & Rivers, 2019). Moreover, humor and memes often serve as an entry point for the public to engage with controversial topics. Memes can compress complex concepts into smaller parcels, and in turn open opportunities for public discourse (Howley, 2016).

@climemechange is a popular Instagram account where climate change and sustainability themed memes, like Figure 2, are curated by an anonymous environmental activist. When interviewed for Gizmodo in 2019, they explained that the key to their account's success was striking the right balance between information, commentary, and comedy (Lipstein, 2019). According to the curator behind *@climemechange*, *"*There's a close tie between comedy and tragedy, and there's some amazing irony in the fact that we're squabbling over this other stuff while the world is literally burning around us…*"* (Lipstein, 2019). The key to a successful climate change meme is to take the current trending meme and tweak it slightly to reflect a pro-environmental message; people look at the average meme for only a second or two, but those two seconds may have the potential to catalyze involvement in broader sustainability activism (Lipstein, 2019).

Figure 2 *- retrieved from @climemechange on Instagram*

Some internet users take their meme usage a step further, leveraging internet memes as a tool for activism. Shifman (2018) references the Occupy Wallstreet refrain “I am the 99%” as an example of this activism subcategory known as a testimonial rally. Testimonial rallies are a type of meme that elevate the voices of the oppressed by sharing an authentic, raw version of truth rather than masking it behind humor, according to Shifman (2018). Despite high levels of engagement with memes connected to a cause, it is important to note that these interactions do not always translate into impactful, real-world change. “Slacktivism” is a term used to describe surface level activism that helps the participant feel good about themselves but does not contribute to the movement in a tangible way (Christensen, 2011). Performative activism furthers the idea of slacktivism, as the participant is externally motivated by a reward; on social media, the reward is the recognition and praise from followers for doing or saying the “right” thing (Kalina, 2020).

There is a balance to be struck between slacktivism and true movements borne from social media. Sharing a politically charged meme to one’s Instagram story or belonging to an online discussion group about sustainability may not definitively push a movement forward, but it can be argued that these small actions can have a positive impact. Social media is strongly integrated into the daily routines of many people (Cain & Policastri, 2011), and sharing cause-driven memes across social media can potentially introduce casual internet browsers to complex social movements and help raise awareness about the practical actions people can take offline in support of a cause (Foust & Drazner Hoyt, 2018).

In some cases, political activism online can have a strong positive correlation with political activism in real life (Conroy et al., 2012). Greta Thunberg, an internationally recognized youth climate activist from Sweden, has relied heavily on social media to spread information about the School Strike 4 Climate movement she has been spearheading over the last few years (Boulianne et al., 2020). Information on the strike went viral and resulted in hundreds of thousands of young people participating in the movement globally. She has a strong social media

presence and some of her interactions with former United States President Donald Trump, as shown in Figure 3, have become viral memes that further brought attention to her climate change work (Zheng, 2020).

Figure 3 - *retrieved from mothership.sg*

Memes shared on social media can be used as a tool for people to connect and discuss their ideas or feelings with others that share their distress. Online discussion platforms or meme sharing groups can help people find validation in their experience, particularly when they are unable to find that type of support within their real-world social circles (Gibbs et al., 2014).

Memes themselves may be fleeting, but their contributions to social consciousness may not be. A study conducted in 2020 has shown a positive connection between exposure to climate change memes online and intention to engage in climate change activism online (Zhang & Pinto, 2021). Additionally, memes are a way for people to process the events unfolding around them while keeping a safe distance; the humor that makes memes so relatable can also help soften the stress that comes from working through a traumatic event (Silvestri, 2018). These memes can even influence collective perceptions and memories of these traumatic events since they serve as a tangible and replicable manifestation of the experience (Silvestri, 2018). Because sharing a meme does not require someone

to write out their own original thoughts or share an original photo, they allow people “to communicate affiliation with less social risk,” (Silvestri, 2018). Memes can help people feel empowered to engage with complex, controversial issues or align themselves with a specific sociopolitical ideology in a lower-stakes manner.

3.3 Practical applications of humor

Humor research is multifaceted. In addition to existing literature outlining the benefits of using humor to handle difficult situations, some studies directly linking climate change and humor have been conducted.

3.3.1 Effectiveness of humor as a coping strategy

Within the realm of humor studies, it has been long agreed by researchers that humor can be used as a powerful tool to reduce stress (Meyer, 2000), mitigate perceptions of threat (Abel, 2002), and cope with the struggles of everyday life (Nezlek & Derks, 2001). This was evident in cases of burnt out academics that effectively relied on humor to curtail their stress levels during difficult periods of their careers (Talbot & Lumden, 2000). Another study within this field argued that humor can be used as a tool to amplify resilience through periods of hardship; interviews conducted with prisoners of war revealed that many attributed their strength through the experience and enduring positive mental health to the sense of control they achieved by sharing humor with each other (Henman, 2001).

Current research continues to support these claims. A study conducted in 2019 sought to identify the role of humor as a coping strategy for existential anxiety (Morgan et al., 2019). The use of humor when considering one’s own mortality ties closely to the idea of joking about climate change. Spending too much time thinking about the inevitability of death, much like thinking about climate change and the inevitable ecological collapse it may cause, is disquieting. Joking about it can give people a sense of control over the uncontrollable (Morgan et al., 2019). In a similar vein, humor has been shown to be an effective coping mechanism for people in mourning or working closely with death (Robalo et al., 2018), and those who are dealing with drawn out trauma after a natural or technological disaster (Cherry et al., 2018). Reliance on humor has also helped increase resilience in

people who suffered adversity as they reassimilated into post-disaster life (Cherry et al., 2018). This phenomenon was replicated during the COVID-19 pandemic in 2020; finding things to laugh about has helped people ease some tension and reclaim some normalcy amidst an ongoing global crisis (Chiodo et al., 2020).

Jokes applied to these sorts of dark situations are often referred to as black humor or “gallows humor,” a term coined by Sigmund Freud to describe the jokes told by prisoners as they were led to their execution (Christopher, 2015; Morgan et al., 2019). Gallows humor often comes off as insensitive to onlookers (Christopher, 2015) but has been proven to help people better handle crisis situations (Maxwell, 2003; Christopher, 2015). While it can help bolster a sense of togetherness through tough times, gallows humor needs to be handled with care (Chiodo et al., 2020). Everyone has a unique sense of humor that is influenced by a plethora of sociocultural factors (Christopher, 2015), and a joke that makes one person feel better may cause harm to someone else (Chiodo et al., 2020).

The resource allocation hypothesis is one attempt to explain why humor can be so effective when applied to divisive concepts. This theory suggests that understanding the nuances of humorous commentary can require quite a lot of mental energy (Skurka et al., 2018). Because of this, the individual is supposedly left with less cognitive resources to process the other more distressing aspects of the situation at hand or concept being discussed. This, in turn, is theorized to decrease the likelihood of someone arguing with the information being presented (Skurka et al., 2018). More research into this hypothesis is necessary however, as multiple studies have been conducted to test the resource allocation hypothesis with mixed results (Skurka et al., 2018).

3.3.2 Humor and climate change

There is a small subset of research that explores the intersections between humor and sustainability issues, albeit in a different manner than this thesis. There are different levels at which humor can be effectively utilized to frame climate change discussions. It can be used to pique interest or introduce climate change into a conversation (Brown, 2019), promote opportunities for engagement in the

greater sustainability movement, offer educational materials, or fully reshape assessments of risk (Kaltenbacher & Drews, 2020). Furthermore, some forms of humor can be used to point out the nuances of the climate crisis more effectively than traditional news outlets or academic articles by condensing complex points into an image macro, comic strip, or punchline of a joke (Brown, 2019).

This strategy can be particularly useful when engaging audiences outside traditional academic or scientific communities, and Brown goes so far as to suggest that laughing about climate change together can help bridge arbitrary social or political divides that prevent decisive action (Brown, 2019). Boykoff & Osnes (2018) echo this sentiment and take it a step further to acknowledge the barriers to accessibility that keep policymakers and the public alike from reading peer reviewed literature on climate change issues. Comedy is easier to integrate into conversation, media, and other peer based interactions than into academic literature, and helps make complex topics more palatable (Boykoff & Osnes, 2018).

Some critics have expressed concern that leveraging humor to spread scientific information about climate change could potentially downplay the severity of the crisis or trivialize the associated risks (Kaltenbacher & Drews, 2020). However, existing research shows the opposite. Some psychological studies have explored responses to humorous content and found that people are often inclined to link their existing knowledge to concepts presented alongside ironic commentary (Becker & Anderson, 2019). Engaging with humorous, satirical, or ironic climate change content, whether it is through internet memes or other forms of humor, can increase the viewer's perceived risk of climate change (Becker & Anderson, 2019). For someone who is already aware of the climate crisis, the same humorous content can reaffirm their existing concerns about climate change as well as their faith in climate scientists to adequately assess the risks and act accordingly (Becker & Anderson, 2019). Additionally, exposure to humorous climate change messaging can have a positive impact on viewers' intention to participate in climate change activism offline (Skurka et al., 2018; Zhang & Pinto 2021).

4 Data collection and analysis

This section presents methodological literature that influenced the research structure for this thesis, followed by further information on how the study was executed. I chose to collect data via online survey, rather than direct observation of online behavior or other methods, to ensure the privacy and integrity of the participants' responses were protected. I relied on content analysis methodology to uncover patterns in the survey results.

4.1 Methodological literature

4.1.1 Survey creation guidelines

To construct the survey, I followed a similar process to what has been outlined in popular survey guidance literature (Janes, 1999). Janes (1999) compares the survey construction process to a version of the general scientific method, just with more specialized instructions. The steps themselves are straightforward. To begin, Janes (1999) suggests first identifying a topic and determining what exactly you aim to discover through your survey. Second, they recommend conducting background research. The next step is to select relevant participants or groups to take the survey, and this is followed by drafting potential questions based on the research goals and ideal participant groups. Once the best questions have been selected from the draft, Janes (1999) recommends designing the survey, pretesting it, and modifying based on preliminary results and feedback. Once the official questionnaire is finalized, the survey is shared with the intended target group. After the survey is closed to responses, the final step in the survey process is to analyze response data and draw conclusions (Janes, 1999).

When creating questions, the recommendations encourage concise, relevant, and straightforward questions that do not use loaded language to influence the responses (Janes, 1999). Varying question structures based on the type of information you are aiming to collect is important in creating a successful survey. Multiple choice questions, for example, are ideal when there are only a few potential choices, while open-ended questions are useful when there are many possible answers (Janes, 1999). For numerically ranked questions, the Likert scale is a commonly applied psychometric tool that allows people to indicate levels of

agreement without requiring a lengthy written response (Joshi et al., 2015).

The *Climate Change Anxiety* section of my survey was loosely influenced by Stewart's 2021 Climate Change Worry Scale. The study presented by Stewart (2021) used a numerical 1 to 5 Likert scale for respondents to self-report their own levels of climate change related worry. These questions linked feelings of worry to the impacts of climate change directly on the participants' own lives, as well as to the more general consequences of a changing climate (Stewart, 2021). This scale focuses on measuring feelings of climate change induced worry exclusively and does not incorporate assessments of other emotional responses like fear or anxiety (Stewart, 2021). The inspiration I drew from this article was tied to structure rather than content; the Climate Change Worry Scale is well formatted to collect accurate self-perceived data on climate change worry and this structure was adapted to the scaled questions assessing anxiety in my own survey.

4.1.2 Analysis methodology

To interpret the survey results and connect them back to the existing literature, content analysis strategies seemed to be the most effective approach. According to research on analysis methods, content analysis can be applied to both qualitative and quantitative data sets to categorize information and identify patterns (Forman & Damschroder, 2007; Elo & Kyngäs, 2008). Forman & Damschroder (2007) address the benefits of applying qualitative methods to a study that uses a combination of open- and closed- ended questions; qualitative content analysis can help contextualize quantitative data and highlight relationships between the quantitative and qualitative data sets (Forman & Damschroder, 2007).

This methodological approach to data analysis leaves space for various levels of abstraction within the interpretation of data (Graneheim et al., 2017); this is particularly helpful in the case of open-ended responses that require deeper interpretation than what is presented at face value. To determine categories for qualitative text-based responses, Forman & Damschroder (2007) recommend taking an inductive approach; this refers to creating categories based on the responses themselves rather than external information to identify patterns in the data (Forman & Damschroder, 2007). As noted by Elo & Kyngäs (2008), content analysis

is a flexible approach to data interpretation that allows researchers a level of freedom to adapt its tenets to suit the parameters of their project, making it ideal for a survey-based study that incorporates multiple question types.

4.1.3 Research ethics

This study was conducted via survey to ensure that respondent anonymity could be maintained throughout the research process. Discussing mental health is often personal or taboo and allowing respondents to remain anonymous also encouraged honest answers to the survey questions. Google Forms was selected as the survey dissemination platform in part because of its familiarity and ease of access, and in part because the platform does not require login credentials or attach any identifying information the responses. To align with ethical regulations laid out to protect human participants (Buchanan & Hvizdak, 2009), no identifying information was collected, providing demographic information was completely optional to all respondents, and explicitly stated consent was required to participate in the survey. A disclaimer at the beginning of the survey stated the following:

> *This survey is part of a thesis project being conducted at the University of Helsinki, exploring the relationships between climate change anxiety and humor with a particular focus on internet memes. It should take about fifteen (15) minutes to complete, and contains a blend of multiple choice and short written questions. Responses are anonymous and no identifying information will be collected aside from optional demographic information. Graphs of response trends and some direct quotes from the survey may be incorporated into the final thesis. Data gathered from this survey will be used exclusively for academic research purposes, and the survey responses will be deleted after the thesis project is complete.*

This was followed by a question directly asking participants for consent to participate in the study. If someone selected yes, they were taken to the first section of the survey. Anyone who selected no would have been diverted from the survey contents and taken to an alternative screen thanking them for their interest in taking part in this study.

4.2 Research methods

4.2.1 Survey construction

To supplement the literature review, I designed a survey (Appendix 1) to collect self-reported attitudes towards climate change, internet memes, anxiety, and the intersections of these topics. My approach to designing the survey aligned with the suggestions presented in the survey construction literature (Janes, 1999). I built the questionnaire in Google Forms to ensure it was easy and approachable for participants to use. The questions were designed to be as clear and unbiased as possible; however, because climate change can be a polarizing topic, there was still some margin for participant bias if they held particularly strong opinions about climate change. I incorporated a blend of open-ended, multiple choice, and numerically scaled questions into the survey.

I began the survey by asking about relevant online behaviors to contextualize online meme sharing behaviors within the broader scope of the survey. Due to some complications with survey dispersal that are further explained in section 4.2.2, two versions of the survey were shared with two distinct participant groups. However, this introductory section was the only one that differed between each version and the rest of the survey was identical for both parties.

The survey shared on Facebook (Appendix 1) began with a *Social Media* section that included questions to determine how long the participants have used social media, if they use social media to interact with memes, and how exactly they interact with memes online. These closed-ended questions were followed by an open-ended question inquiring about why people find enjoyment in interacting with and sharing internet memes. The alternative version of the survey shared on Reddit instead had a section titled *r/climatememes* (Appendix 2) that asked participants similar questions about how long they have been involved with *r/climatememes,* how they use the subreddit, and why they joined.

The second section of this survey, *Climate Change & Anxiety*, was aimed at assessing personal opinions about climate change as well as determining self-reported levels of climate related anxiety. It was loosely influenced by Stewart's

Climate Change Worry Scale (Stewart, 2021), although rather than focusing on worry this section implemented broader questions to gauge understanding of climate change as well as emotional responses. The first question in this section was open-ended and asked participants to describe what they thought of when they heard the term “climate change.” This was followed by four questions that leveraged a 1 to 7 Likert scale (Joshi et al., 2015) to measure perceived climate change impacts on local and personal levels, as well as intensity and frequency of climate change anxiety. These ranked questions were followed by another open-ended question that asked respondents to explain how they manage to cope with their feelings of climate change related anxiety or stress, if applicable.

The title and theme of the third section was *Memes*. This section of the survey was intended to delve deeper into participants’ opinions on internet memes. I asked open-ended subjective questions about what makes a meme humorous or memorable, and how respondents thought interacting with climate related memes could potentially impact anxiety levels. This section also inquired about behaviors directly associated with climate change memes, asking closed ended questions about whether participants had ever seen a climate change meme before and if they actively made or shared memes based on serious topics like climate change.

The final informational section was a case study. The section, titled *Climate Change Memes*, provided three climate change themed memes for participants to look at. After looking these over, the participants were asked to select which of the three memes they liked most. Subsequently, they were asked to explain how the meme made them feel and who they believed the intended audience of the meme was.

These content sections were followed by a short and optional demographic section and provided a space for participant feedback.

When I posted the survey online, I encouraged people to share their favorite climate change memes in the comment section so I could incorporate them into my thesis. Nobody from Reddit shared a climate change meme on the *r/climatememes* post. 3 people did share memes in the comments of the Facebook

post (Appendix 3). Because the survey responses were anonymous and the request for memes was shared in the Facebook post itself, there is no way to know if those people who contributed a meme also completed the survey.

4.2.2 Participant groups

Initially, the survey and case study were going to be targeted towards a specific meme sharing Facebook group called *Wild Green Memes for Ecological Fiends*. In addition to asking about climate change and memes, the first iteration of the survey inquired about participation in this Facebook group to determine why people join these online communities and what role meme sharing plays in their day to day life. *Wild Green Memes for Ecological Fiends* was selected as the intended case study due to its active and diverse user base. The memes shared within this group daily tackle a broad range of ecological, environmental, and biological themes, which indicated that most of the group's participants who could have potentially taken the survey would have been familiar with climate change memes, at least conceptually. However, I learned after designing the survey that this group is governed by a stringent moderation team that must approve the content that is shared with the rest of the group. Certain types of posts, including those containing academic research surveys, are restricted from being shared.

I encountered similar issues after redesigning the survey to suit the two backup groups I had selected. *Zoom Memes for Self-Quaranteens* and *Grad-School Memes with Relatable Themes* are based on different topics than *Wild Green Memes for Ecological Fiends* but share a parallel structure and similarly diverse user base. Unfortunately, these groups also follow similar content moderation guidelines that prohibit members from sharing certain types of surveys. Because these groups collectively have hundreds of thousands of members, some posts are only approved and shared weeks or months after they are submitted. It is possible that the post linking the survey I submitted in February is still pending approval from the moderation team even now, but there is no way to check this or expedite the process.

Rather than waiting on these groups for approval, I reworked the survey again and shared it the *r/climatememes* forum on Reddit. This subreddit, as the forums

on this site are known, has a lower membership and is less active than the Facebook groups.; however, *r/climatememes* has more lenient guidelines on content submissions and no restrictions on surveys. This iteration of the survey was open for a full month. Because the response volume was so limited after the first week, I left it open to collect responses in the background while I refocused my efforts again. This version of the survey received 16 responses.

The final version of the survey, as presented in Appendix 1, was retooled for a public Facebook audience. The questions I originally included about involvement patterns in the specific online communities were replaced with questions about general social media usage, and the rest of the survey remained consistent with the earlier versions. I shared the survey to my personal Facebook page with a short description of my research plan on 6 March. Many of my Facebook connections are peers from my Environmental Studies bachelor program, peers from the ECGS program at the University of Helsinki, and other sustainability professionals. A fair amount of the people I know in my own life are invested in climate change, experience some level of climate anxiety, and/or actively interact with internet memes, making them a relevant sample group. More people took an interest than I expected, and a few of my Facebook friends shared the survey to their own pages to grow the audience. It remained open for responses until 12 March, at which time I felt the volume of responses was appropriate to analyze myself without it becoming an overwhelming amount of content to sift through. During that time, 77 people completed the questionnaire.

Between the two iterations of the survey that successfully collected responses on Reddit and Facebook, a total of 93 people were surveyed for this study. An overwhelming majority of the total survey participants were women based in the United States between 20 and 29 years old. All of the respondents were based in Europe, North America, or Australia. The Reddit group was more diverse in terms of age, gender, nationality, and level of education when compared to the Facebook group, but had a much lower number of responses (16 from Reddit compared to 77 from Facebook).

4.2.3 Data analysis

To analyze the data collected from the survey, I used content analysis methodology based on the literature presented above (Forman & Damschroder, 2007; Elo & Kyngäs, 2008) to code open-ended responses and identify patterns across all the survey questions. Google Forms automatically converts closed-ended survey responses into charts to visualize the data and gives the option to download the direct responses to all questions as a spreadsheet. I worked within this spreadsheet to color code both open- and closed-ended responses to identify the potential relationships between each respondent's answers to different questions, as well as to identify broader patterns.

To analyze the open-ended responses, I conducted an inductive content analysis (Forman & Damschroder, 2007) to code the data. I read the answers to each open-ended question and noted commonalities between each answer. After identifying key words and phrases that appeared multiple times, I then condensed these key words into categories that reflected the themes of the responses. In the spreadsheet containing the survey results, I color coded each response based on the category or categories that best suited it. Some responses, particularly the longer or more detailed ones, fit into multiple categories and were color coded accordingly. From there, I then compared these findings to the responses provided in closed-ended questions to determine if there was any relationship between how different questions were answered. This analysis helped identify the different ways people respond to climate change, how climate-change anxiety is experienced on an individual basis, and perceived relationships between memes and climate change anxiety. The initial results from the survey are presented in Chapter 5 and findings from the analysis are discussed in Chapter 6.

5 Results

The results of the study have been divided into 4 sections – Participant usage of memes and social media; Respondent perceptions of climate change, anxiety, and coping strategies; Study participant perceptions of memes and their relation to climate anxiety; and Respondent interpretations of climate change memes. The responses from the Facebook version and Reddit version of the survey were analyzed together, except where otherwise stated. The results presented are reflective only of the 93 participants of this survey and do not necessarily reflect the opinions of the broader population.

5.1 Participant usage of memes and social media

For many of the survey participants, social media has been present in their lives for over a decade. More than half of the Facebook respondents asked this question stated that they have been using social media for over ten years, and 69 of the 77 responses indicated that they have been using social media for 7 years or more. Only 2 individuals in the Facebook survey group stated that they do not interact with memes online; both participants indicated that they had been on social media for more than 10 years.

Rather than being asked about general social media usage, the 16 Reddit respondents were asked specifically about their participation in the *r/climatememes* subreddit. Most of them said they have been involved with this online group between 6 months and 2 years. Considering the group was created in May of 2019, this may not indicate how long each participant has been interested in climate change related discourse online. One of the respondents identified themselves as the subreddit's creator and moderator. They mentioned that their inspiration to start the subreddit was "because I was let down by the low participation in weekly Fridays for Future protests and wanted to promote climate activism."

Among the participants that do intentionally interact with memes online in both groups, a significant majority do so multiple times per week or more. In terms of interacting with memes, responses between the Facebook and Reddit groups differed, likely influenced by the context of the questions. The Facebook group

was asked about their general interactions with memes across the internet. Sharing existing memes with others was by far the most popular way to use them, with 72 of the 77 participants stating that they share existing memes on their page or send them directly to other people. The Reddit group was asked about how they interacted with memes within their online community, so perhaps it isn't surprising that all 16 participants stated that they used the group to browse climate memes. Creating original memes was the least popular option for both the Facebook and Reddit groups, with only 11 of the 93 total survey participants saying that they make their own memes to share online. Those that do create their own memes tend to also engage with memes in other ways, such as by browsing or sending them to friends. In addition to the examples of interaction provided in the survey, some people mentioned other ways they use memes online. Two different participants said that they don't intentionally browse for climate memes, rather they are sent memes by friends or the memes come up within their social media feeds; thus, their interaction is rather passive. Two people also mentioned using memes to promote climate action and climate change discussions in other groups online.

The last question that differed between the Facebook and Reddit groups asked about the "why" behind their meme usage. The Facebook group was asked, in general, what they enjoyed about interacting with or sharing memes. Amongst the Facebook participants, it became apparent that many people rely on memes as a communicative tool to express their own ideas without having to struggle with finding their own words. More than one person mentioned feeling anxious or stressed in social situations and seeing memes as an easy way to open a conversation, especially if the subject is somehow complicated. Memes are perceived as a great way to simplify complex topics, serving as a beneficial educational tool or entry into deeper discussion. Some other participants felt that memes are an effective way to share feelings or express some subtleties that can be missed in verbal or written communication. According to one participant, "Memes generally do an excellent job of expressing things that only verbal communication does not always get across." Another commonality between these replies was acknowledging the universal nature of memes; they are funny because they are relatable. People can see a meme and feel understood or share it with a friend to confirm that they are not alone in their feelings. As indicated by

the popularity of sharing memes expressed by the participants in addition to the comments regarding their ease of communication, it seems that memes are prevalent in online discourse because of their strong social component.

In addition to the benefits of using memes to communicate, there were some other similarities between the explanations provided by the Facebook survey participants for their meme usage. Most of the respondents specifically cited humor as a positive aspect of using memes, expressing that they made light of difficult topics, made them happy, and allowed them to share joyful things with others. Anxiety reduction was another major commonality. One person said that memes "make impending doom somehow more laughable." Memes were also seen as a fun distraction from the more austere aspects of the topic at hand, be it climate change or another socially charged topic. Some people explicitly acknowledged that their use of memes was a conscious choice to help them manage their negative emotions, while others merely stated that memes made them smile. It is pertinent to note that one person, throughout this section of the survey, expressed obvious distaste for memes. They called meme sharing "pointless," and reiterated that they do not interact with memes or share them online. This outlier starkly contrasted with the 71 other positive responses to this question (and the 5 who left this question blank).

Rather than being asked about general social media behavior, the Reddit respondent group was instead asked about why they initially joined the subreddit, and what they liked about being involved with *r/climatememes*. All the responses here connected more specifically with climate change themed memes than those in the Facebook group. Many of the respondents mentioned that they joined this online community because they were looking for a sense of camaraderie and validation in their feelings of climate anxiety or, as one user put it, "crushing existential dread." One person mentioned that *r/climatememes* was less stressful than different climate change discussion forums, and another expressed anger about the climate crisis, stating, "I joined because I'm mad about the climate situation and I'd rather laugh then [*sic*] cry." Multiple respondents seemed aware that they were using this online community to manage their negative feelings,

although one mentioned that it wasn't specifically a coping mechanism so much as a supplement to their existing climate change knowledge and activism.

5.2 Respondent understanding of climate change, anxiety, and coping

When asked about their thoughts on the term "climate change," about half of the participants categorized their associations to the phrase by discussing specific impacts of climate change on the physical world. They listed dramatically shifting weather patterns, melting ice caps, desertification, and other changes in ecosystems as straightforward consequences of climate change. About a quarter of the total participants said that they associate climate change with negative emotions such as anger, distress, or guilt. Many of the responses explicitly mentioned fear of the future, or likened climate change to "doomsday" or "the end of times." These people perceive climate change as a long term issue that may not be effectively curtailed within their lifetime. More than one person lamented that climate change may be a deciding factor as to whether they should choose to have children.

In contrast, only 11 of the 93 total people that replied to this question noted that hearing about climate change inspired them to pursue positive changes or sustainable solutions. Based on the responses, it seems that more people connect climate change to harm for the physical environment rather than connect climate change to social, political, or economic consequences. Only a quarter of the responses directly placed some level of blame on humans as a driving cause of climate change. This blame, however, was not evenly distributed across all of humanity; some responses blamed the worst of climate change on people with wealth, while others felt strongly that climate deniers were the issue. One person expressed belief that the United States is the most at fault for the climate crisis. Some of the responses to this question, however, reflected a deeper understanding of the interconnected systems that play into climate change. One respondent stated that climate change reminded them of "old white men denying reality and insisting everything is fine," which is a rather scathing commentary on the socio-political systems that govern climate change mitigation efforts. More than one

reply called for a drastic shift away from capitalism as a potential solution to the climate crisis. Others acknowledged that climate change would lead to potentially catastrophic collapse of the existing systems that humans currently rely on to govern society. Additionally, there was some commentary about the divisive nature of climate change, with multiple people mentioning politics, climate change denial, or the fact that this type of issue “shouldn’t be controversial.”

The responses were mostly straightforward, but some included emotionally charged language to express their concerns. One person stated that humanity needs to “wake the ‘f’ up and change our lifestyles” to solve the crisis. Another summed up their response to climate change as “AHHHHHHH!”, which can likely be interpreted as an expression of distress. The same respondent followed this exclamation with a call to dismantle capitalism if we are to have any hope of reversing climate change.

There seemed to be a slight connection between the perceived impacts of climate change on one’s personal life or local community and self-reported climate change anxiety levels. Respondents expressed more awareness or concern for climate change impacting their community, city, or country than for climate change impacting their life directly. On a scale from 1-7, with 1 indicating no anxiety and 7 indicating significant anxiety, 75% of the total respondents selected a 5 or higher to reflect their anxiety levels. When asked how often they felt anxious or stressed about climate change, with 1 indicating never and 7 indicating always, over half of the participants selected a 5 or higher to reflect the frequency of their anxiety.

When asked, “How do you cope with your feelings of climate change related anxiety or stress?” a handful of participants stated that they simply don’t cope with their climate change related anxiety. 7 of the participants skipped the question entirely. Still others said they try not to think about it or try to focus on other things. Those that do attempt to cope outlined a variety of coping mechanisms, ranging from crying and nihilism to researching the problems, participating in lobbying or civic engagement efforts, and donating to conservation-related causes and other environmental organizations. Only 11 mentioned humor and memes as coping

tools they consciously rely on to manage their climate anxiety. Over a third of the participants find comfort in proactive behavior or activism to help mitigate their own environmental footprint. Communication with others was a more popular tool than avoidance or denial; many people expressed that talking to their friends, family, or people in online communities was instrumental in helping them feel better. Furthermore, 5 respondents disclosed that they use therapy or medication to alleviate their climate related anxiety. In some of these cases, professional treatment was sought solely to manage climate change anxiety, while in others it was pursued as an addition to existing treatment regimens for other mental health concerns.

There was some overlap in coping strategies between individuals that experience high levels of climate anxiety and those that experience low levels of climate anxiety. People that are acutely aware of the climate change impacts in their own community yet still retain low climate change related anxiety levels were more likely to report that they had already incorporated environmentally conscious behaviors into their own life, or that the situation was not within their control to fix. Some people acknowledged that they were not concerned about climate change within their own lifetime, noting that some seemingly pro-environment developments or behaviors still had negative consequences. A couple of respondents said that regular prayer or their faith in a higher power were the reason they did not feel very anxious about climate change or suggested that these were good ways to manage the anxieties that do come up.

5.3 Perceived relationship between memes and climate anxiety

It is important to acknowledge here that humor is very subjective and difficult to quantify. When asked about what makes a meme memorable or humorous, a handful of participants mentioned that they had a hard time putting their sense of humor into words. Roughly half of the participants said that they want memes to be relatable, and over a quarter mentioned humor as a relevant factor. Because the question was phrased to ask why a meme was funny as well as memorable, it is possible that people did not feel the need to explicitly state that a meme must be funny to be good since it is already implied that memes are designed to convey

a message via humor. Novelty, however, was also acknowledged; people appreciate memes when the humor involved plays around with expectations or provides a fresh, unexpected take on the topic.

Many respondents indicated that memes are most effective when they reference familiar pop culture or media, and when they are in easily replicable formats. Conciseness is key as well; text heavy meme formats are less likely to resonate with broad audiences. Despite the associations between memes and humor, about 1 in 5 respondents stated that truth, honesty, or factual accuracy is what helps them connect to and remember a meme. This phenomenon aligns with concerns expressed by a handful of the survey base that worry about memes being misconstrued. Depending on context and origin, memes may intentionally or unintentionally spread misinformation, be misinterpreted by the audience, or misrepresent facts to suit a particular agenda or narrative.

At the time of the survey, more than half of the Facebook survey participants and all of the Reddit survey participants were aware of having seen at least one climate change themed meme before participating in the study. When asked about the content of the memes they typically interact with, slightly more than half stated that they actively make or share memes about serious topics such as, but not limited to, climate change.

Among the responses to the question, “Do you think interacting with climate change memes can influence anxiety levels? How?”, I was able to identify five distinct categories of responses: those who believed climate change memes could increase anxiety levels, those who perceive a beneficial relationship where climate memes decrease anxiety, those who acknowledge the potential of climate memes to have an impact on anxiety but are unsure if the dynamic is positive or negative, those who were adamant that climate change memes have no discernable relationship with climate anxiety, and those who did not know or did not answer. The breakdown of these responses is shown in Figure 4.

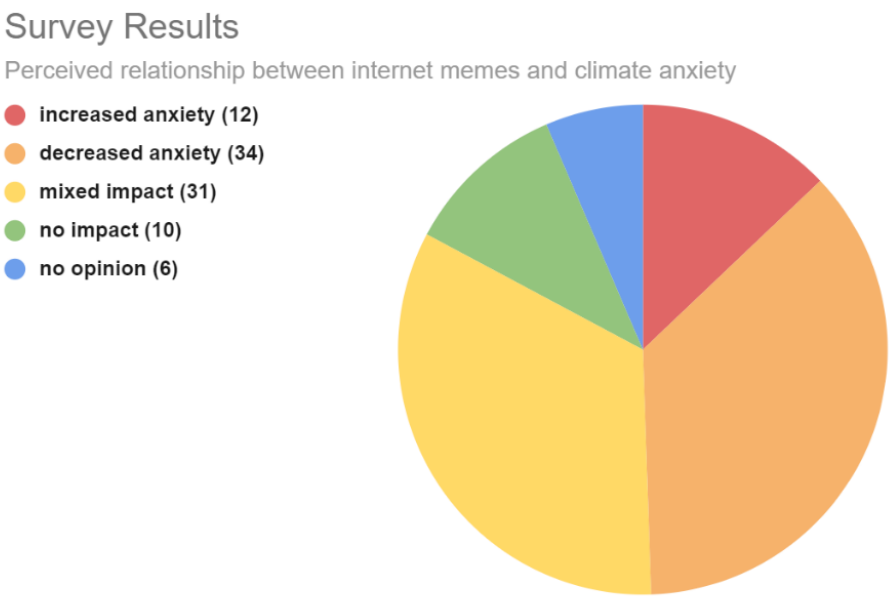

Figure 4 *- chart depicting participant perceived relationship between internet memes and climate anxiety expressed in the survey responses*

Of the 93 respondents, a strong majority expressed the belief that memes do have the capacity to influence anxiety levels, although opinions were mixed on whether the impacts would be positive or negative. Some people thought that seeing climate change memes could elevate anxiety because they are a reminder of the climate crisis or may introduce other aspects of the problem of which people were previously unaware. Repeated exposure to climate change memes may magnify discomfort and stress associated with climate change. One person mentioned feeling concerned over the factual accuracy of the memes which further heightened their climate anxiety. Another respondent mentioned that even if the meme itself does not influence their emotions, reading the comments on a climate meme post can make them feel anxious due to the conflicting opinions shared.

Those who believed climate change memes have the potential to reduce climate change anxiety extolled their humorous, easily sharable nature as an ideal manner to alleviate stress. To quote one participant, “Memes don’t make me anxious, climate change makes me anxious. Memes just let me know I’m not alone!” A helpful metaphor shared by another participant compared climate anxiety to a pressure vent and climate themed memes to a release valve. Memes can recontextualize issues, making them more palatable within the grand scheme of things.

Many people mentioned that sharing memes and feeling less alone in their stress could be key components in reducing their anxiety. Those in this camp argued that climate memes may serve as a reminder of climate change in a good way, encouraging positive or proactive thoughts about the issue rather than negative.

For those on the fence, the popular opinion seems to be that the anxiety-negating effects of memes are temporary and should not be mistaken for a long term solution. These responses reflected the subjective nature of memes, acknowledging that they are variable and can appeal to a wide variety of humor styles. Some climate change themed memes may be more helpful than others, depending on the way they frame the issue. Additionally, it was suggested that memes can help reduce anxiety in tandem with other, more proactive forms of coping such as mindfulness and positive discussion.

As shown in Figure 4, 12 people thought memes could increase anxiety, 34 suggested memes could decrease anxiety, and 31 believed they could have positive or negative impacts on anxiety levels. Ten people stated that memes likely do not have any impact on anxiety levels and 6 respondents said they did not know or had no opinion on this potential correlation.

5.4 Respondent interpretations of climate change memes

This section of the survey presented three memes (Figure 5, Figure 6, Figure 7), instructed participants to pick their favorite, and then asked how their chosen meme made them feel and who they believed the meme was intended to reach. These responses shed light on how preferences for certain memes may vary and what factors differentiate a successful climate change meme from a less successful one. The memes used in the survey were chosen based on use of a recognizable pop culture character (Figure 5), prevalence in online climate change discourse (Figure 6), and replication of a trending meme format (Figure 7).

Figure 5 *- Surprised Pikachu - Angela (2018)*

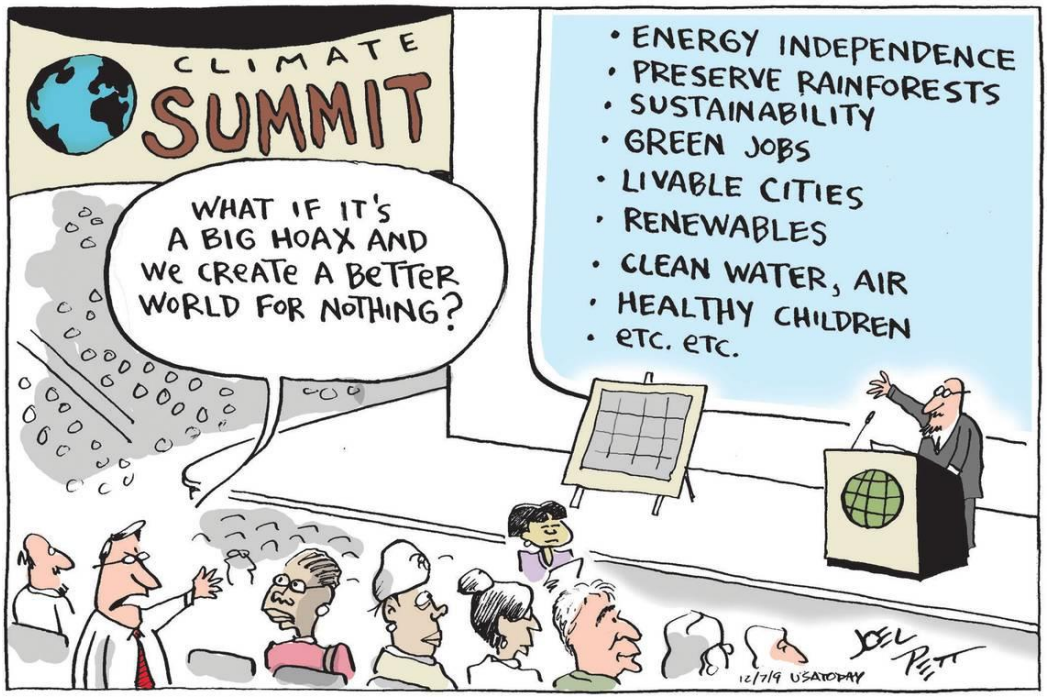

Figure 6 *– What if it's a big hoax and we create a better world for nothing? - Joel Pett (2009)*

Figure 7 *– This is not fine - Jackson Ryan (2019)*

5.4.1 Emotional responses to climate change meme examples

42 of the total participants, or just under half, chose the *Surprised Pikachu* meme as their favorite of the three examples. 40 selected the *What if it's a big hoax and we create a better world for nothing* comic, and 11 preferred the *This is not fine* meme. The distribution of favorite memes differed between the Facebook survey group and Reddit survey group; *Surprised Pikachu* was the resounding favorite of the Facebook respondents, while 12 of the 16 Reddit participants selected the *What if it's a big hoax* comic as their favorite. One of the Reddit participants noted that the *Surprised Pikachu* meme was outdated, saying it "would have beeen [*sic*] my choice when it came out because it's funny, but *Surprised Pikachu* meme is no longer 'dank.' Extremely popular memes become less funny after they are used too much." This commentary may also explain the low popularity of the "This is not fine" meme, as the format has been around for a couple years at this point and new iterations may read as overdone or no longer popular.

The emotional responses amongst each meme varied drastically, reflecting the subjective nature of humor and the differences in what people find funny. Between the three memes, some of the emotional responses were consistent – humor, frustration, and sadness were noted in the reactions to all three memes.

Surprised Pikachu elicited the most positive responses. People recognized Pikachu as a popular cartoon icon and related to the character's facial expression. To the respondents, this meme represented multiple facets of the climate change issue; some said that the meme depicted the surprise of policy makers who fail to address systemic problems, while others felt that it represented humanity's disconnect from and perceived superiority over the natural world. One respondent noted that their emotional reaction was "humorously frustrated," because it called attention to an important issue while also acknowledging the sense of alienation that comes with fighting for a cause. Multiple people who selected this meme said that the meme reminded them of climate change deniers and the ignorance that has perpetuated the climate crisis, leading to frustration or anger. Other respondents used words such as "good," "amused," or "sardonic" to describe their emotional reaction.

What if it's a big hoax resulted in the most reflective responses, as well as the most varied. Many people found the comic enlightening or educational and said that this meme validated some of their feelings towards climate denial mentalities. More than one person was frustrated by the concept, expressing belief that even if climate change weren't a threat the changes suggested by the comic would still be beneficial for the planet and its inhabitants. One participant suggested that the meme seemed to convey basic common sense and said the reason they enjoyed it was because they hoped climate change deniers would see it and start understanding the issue. Still others made connections to the intrinsic problems with capitalistic social structures and political divisiveness that have worsened the impacts of climate change. These responses offered further commentary on the shortcomings of humanity that would lead people in power to assume that making the world better could "be for nothing." One respondent was skeptical that this could be considered a meme since it is structured as a traditional comic strip rather than an image macro; however, this image has been spread across the internet in a viral format and thus is considered a meme.

This is not fine received the most negative emotional responses. Terms like "morbid," "desperate," and "sad" dominated the replies. Even those who reported

laughing mentioned a sense of mixed emotions that intersected with their enjoyment. One person said the meme made them feel “moderately bemused.” Another explained feeling angry at this meme because the content reminded them of the wildfires that have increased in their own community due to climate change.

5.4.2 Perceived intended audience of climate change memes

A startling number of people misinterpreted the question asking who the intended audience of the meme was, instead choosing to explain the meaning that the meme was trying to convey. Two responses suggested that these memes might be offering a middle ground to climate deniers, saying that even if climate science is wrong the benefits of environmentally conscious change are still worthwhile. Others offered criticisms on the human versus nature dichotomy and claimed that the memes reflect a sense of desperation towards climate change. Climate memes were also perceived as an awareness tactic by some respondents, who suggested that the purpose of sharing these memes is to spread information about climate change and perhaps encourage viewers to conduct further research.

For those that did address the prompt, there were again some commonalities across the responses to all three memes. The survey participants seemed to agree overwhelmingly that memes were intended to reach younger audiences, particularly Millennials or Generation Z, and people who were already invested in climate change or experiencing climate anxiety. Climate deniers were also identified as an important audience to reach, suggesting that many participants see memes as a tool to change previously held convictions. Additionally, there were responses to each meme that suggested the intended audience was “everyone,” indicating that memes could be beneficial for any viewer base.

The discrepancies between responses indicates that meme users perceive the effectiveness or intention of memes differently. Those who favored *Surprised Pikachu* suggested that the meme was aimed at not only at climate change deniers, but also at people who were upset with climate change deniers. Members of the United States Republican political party were also identified as a suggested

audience. One person said that *Surprised Pikachu* is specifically geared towards environmentally conscious meme enthusiasts, continuing that this example may require context for the meme format to understand the messaging. People who chose the *What if it's a big hoax* comic believed the intended audience could include middle class Americans, policymakers, the political left, and overall older audiences compared to the other two memes. The group that selected *This is not fine* as their favorite meme thought that the meme was targeted towards young people, particularly those in their twenties, or California residents.

5.4.3 Participant Submitted Content

Within the posts sharing the survey to Facebook and Reddit, I asked people to share their favorite climate change related memes in the comments to supplement the data collected within the survey. Three people from Facebook, and nobody from Reddit, shared a meme. Two of the memes used imagery of easily recognizable pop culture symbols – one meme featured characters from the 1990's TV show *Captain Planet and the Planeteers*, and another used a picture of Mr. Potato Head, a plastic toy from the 1950's and prominent character in Disney's *Toy Story* movie franchise. The memes that were shared (Appendix 3) all addressed climate change, but also acknowledged the intersections between climate change and other pressing issues. Climate change was juxtaposed with commentary on capitalism, eco-fascism, and the gender binary, further highlighting that that climate change is a multifaceted issue and successful climate change memes encourage their audience to consider these connections.

6 Discussion

Anxiety is a very personal experience, and its subcategories and associated coping mechanisms are no different. Finding a community online, sharing memes, and joking about the existential worry that climate change heralds are all valid coping mechanisms, but they are not the only ones and do not provide a catch-all solution to managing climate change anxiety. The results from the survey reaffirm some connections between humor and climate anxiety suggested in the literature review and offer further insight into this relationship.

Many of the survey respondents indicated that the term “climate change” has negative connotations. Most of the study participants acknowledged that they have experienced at least some level of anxiety tied specifically to their concerns about climate change and environmental degradation (Pihkala, 2020). Others mentioned feelings of dread associated with an ecologically unstable future and expressed an explicit fear of bringing children into a world ravaged by the consequences of unmitigated climate change. A strong negative emotional response to climate anxiety that influences someone’s decision to reproduce may indicate a maladaptive anxiety response (Clayton, 2020) that surpasses the ideal “Goldilocks Zone” of productive climate anxiety presented by Dan Rubin (Wray, 2020).

Self-reported coping skills varied between survey respondents, and only a handful of people indicated that they actively seek out humor to manage their climate anxiety. Despite this, many participants reported feelings of happiness, relief, reassurance, validation, or empowerment after looking at the climate change memes presented in the survey. This pattern echoes the sentiment of previous humor studies that suggests humor can provide comfort through hardship (Henman, 2001; Cherry et al., 2018; Chiodo et al., 2020) as well as encourage real world activism (Skurka et al., 2018; Zhang & Pinto, 2021). The results from my survey, when presented in tandem with this literature, suggest that these observations may extend to the context of internet memes and climate change anxiety. However, the survey responses also indicate that humor is typically used as a more passive form of coping rather than an active choice and likely works best when combined with other anxiety management skills.

Proactively seeking out sustainable solutions, participating in political or environmental activism, and making positive lifestyle changes were the top reported coping mechanisms by survey respondents to help manage their feelings of climate anxiety. This strategy was followed by discussing the issues with other people either online or in person and learning more about the relevant issues. The survey results indicated that people feel best when they are actively doing something to combat a problem, and reliance on humor was only reported as secondary coping skill. It is, however, possible that more people use humor to manage their anxiety than they realize. Scrolling through social media can be a very passive activity that doesn't necessarily require the user's full attention, and they may scroll past a climate change meme and laugh without actively processing it instantly. Others may see someone else sharing a climate meme online or speaking about the climate crisis in a lighthearted way and feel validated in their perspective on the issue. Existing research reflects these benefits, suggesting that engaging with humorous climate change content online can positively inspire active online or offline climate change activism (Skurka et al., 2018; Becker & Anderson, 2019; Zhang & Pinto, 2021). Conscious decisions, like participating in activism, are easier to recognize and self-report than more passive coping skills.

It is worth noting how humor and memes were lauded by survey respondents for their positive influence on communication with friends and family. Approaching climate change through the lighthearted, relatable lens of online memes allows for more accessibility and potential for frank discussion on complex topics (Boykoff & Osnes, 2018; Brown, 2019). Some people even cited memes as a tool that helps them overcome feelings of social anxiety when broaching heavy topics, directly supporting existing humor and anxiety research (Morgan et al., 2019). Many participants felt that leveraging climate change memes to encourage discourse through social media channels could help spread awareness about the climate crisis and relevant sustainability topics. The formula for creating an effective meme, as presented by the anonymous curator of *@climemechange* (Lipstein, 2019), seemed to resonate with those who sought familiarity in their memes. The intertextual nature of memes that allows them to draw references from and combine different topics (Laineste & Voolaid, 2017) is what allows for

diverse audiences to respond positively to the same meme despite sociocultural differences and varied interpretations of a meme's intended messaging.

As Bauckhage (2011), Wu (2013), and Ayele (2021) suggested, the basic meaning of a meme should be inherently understood by the masses without necessitating supplementary explanation. The survey results did reflect this to an extent, but also highlighted the idea that memes can be interpreted differently as influenced by lived experience. Memes are an effective way to introduce the nuances of climate change to a wide audience while still retaining their integrity as an accessible, sharable, bite-sized piece of content. Memes are not a replacement for independent critical thinking or fact-based research, but they can offer an opening into the otherwise gatekept realm of climate change related scientific discourse and policymaking discussions (Howley, 2016).

Regarding the climate change memes that were shared in the comment section of the survey post, it was clear that the effectiveness of climate related memes can be partially attributed to their ability to draw connections between diverse social issues. Based on these examples (Appendix 3), coupled with other climate memes shared from *@climemechange* on Instagram and within the *r/climatememes* subreddit, it appears as though many if not most climate change memes are intersectional in nature and address the other social, political, and scientific issues that play into the experience of climate anxiety (Ray, 2021). These may also reflect a broader potential link between climate change anxiety and leftist political ideologies, although more research may be necessary to confirm or elaborate on this relationship.

Ultimately, the survey data does support the links between humor and climate anxiety presented in the literature review. Climate change memes are popular within online spaces and comprise a decent amount of climate change discourse outside of academia. People may not rely solely on this specific type of humor to address their environmental worries, but the survey responses do suggest that using humor can make difficult conversations about climate change easier to digest and help mitigate anxiety associated with climate change.

7 Conclusions

In summation, it is apparent that humor can play a useful role in mitigating feelings of climate change and environmental anxiety. Internet memes that make light of the climate crisis are a popular and effective component of this dynamic. They can be used as a tool to introduce the complex concepts behind climate change to broad audiences in a simplified and accessible manner, validate climate change induced stress through community building, and share opinions in an efficient manner while eliciting some laughs. This reflects some of the observations made in general humor and anxiety studies. Humorous memes are not a miracle cure for climate anxiety, but they can work in conjunction with other coping mechanisms to help climate anxious individuals manage their feelings.

When considering the results of this study, it is important to recognize that the sample size was relatively small. Furthermore, the responses likely reflected some bias due to how the survey was shared. The Facebook version of the survey was posted to my personal Facebook page, and many of my online connections are peers that hold stronger environmental convictions than the general populace or colleagues that work in the sustainability field. Other limitations reflected in the self-reported demographic section of the survey revealed that of the 93 total respondents, a strong proportion of were either women, based in the United States, and / or between the ages of 20 and 29. However, the potential sustainability bias and demographic factors may indicate that climate anxiety and internet memes are likely to be more relevant to this survey respondent group than to the population at large.

Within the survey itself, I included a space for feedback and additional comments from the respondents. Most of the replies were notes of enthusiasm and encouragement, and some offered suggestions on how to improve this survey. These ideas included broadening demographic options, reframing some of the questions, and sharing the survey to a broader audience. This type of feedback could be helpful to take into consideration when designing future research plans for this topic to ensure participants feel represented and the expectations for their responses are clear. Additionally, it would be ideal if all participants were given an

identical survey in any future studies. The general *Social Media* section in the Facebook version of the survey replaced the *r/climatememes* section in the Reddit version and could have been rephrased in a better way. Because the first section of the survey asked such different questions of the Facebook and Reddit groups, the responses were not directly comparable. This made these replies more difficult to interpret, although some similarities were still identified via those questions. Additionally, the questions asked in the *Social Media* section of the Facebook survey were too similar to the *Memes* section included in both versions and it became clear upon analysis that some of the questions were redundant.

While this study did identify some patterns between humor and climate anxiety, it was purely exploratory. More research may be necessary to shed further light on the connections between these topics. Similar studies conducted on a wider scale in the future could be illuminating. The scope of this thesis was quite large, and it was difficult at times to compile a comprehensive literature review in conjunction with a full survey as an individual researcher working within a limited time frame. For future elaborations of this study or other studies addressing similar topics, it could be beneficial for an interdisciplinary team comprised of environmental scientists, social scientists, psychologists, and internet meme researchers to collaborate and expand upon the findings. Potential improvements could include in-depth interviews, survey responses collected from a broader audience over a longer time frame, detachment from personal networks, and a more in-depth literature review. A larger study could also incorporate the impacts of climate change and associated anxiety across demographic lines. When researching sociological patterns, it is important to recognize the impacts of race, gender, socioeconomic status, and other power imbalances that may influence personal worldview. These intersections are intricate, and it would not be fair or ethical to apply the results identified in this limited study to the global populace.

Some broader implications for extending this study encompass multiple potential avenues. Based on the results of this study, memes are an accessible way to share knowledge. Perhaps this could be translated into shaping educational tools, and the use of humorous content in general scientific communication should be explored. There is strong potential to increase the accessibility of peer-

reviewed scientific knowledge to the general population by using humor. Online humor transcends meme sharing alone, and it could be interesting to explore further how social media and the internet has influenced modern conceptions of what people find funny. Other forms of humor off the internet, such as jokes shared face-to-face or comedy in film and television, may play similar roles in the discourse surrounding serious topics. A comparison study identifying the differences between online and offline humor could shed some light on broader communication patterns. There is also a potential correlation between political affiliation and responses to humor that could be fascinating to explore.

In addition to the potential for further humor research, this study briefly touches on the need for expanding research into the broader sociopolitical implications of climate change and climate anxiety. Limited research exists detailing the demographic factors that influence the experience of climate change anxiety, and research is necessary to uncover these linkages as well as to determine solutions.

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Finally, I want to thank the thousands of people on the internet that make, share, and laugh at climate change memes every day - this study would never have been possible without your dedication to making light of the global climate crisis.

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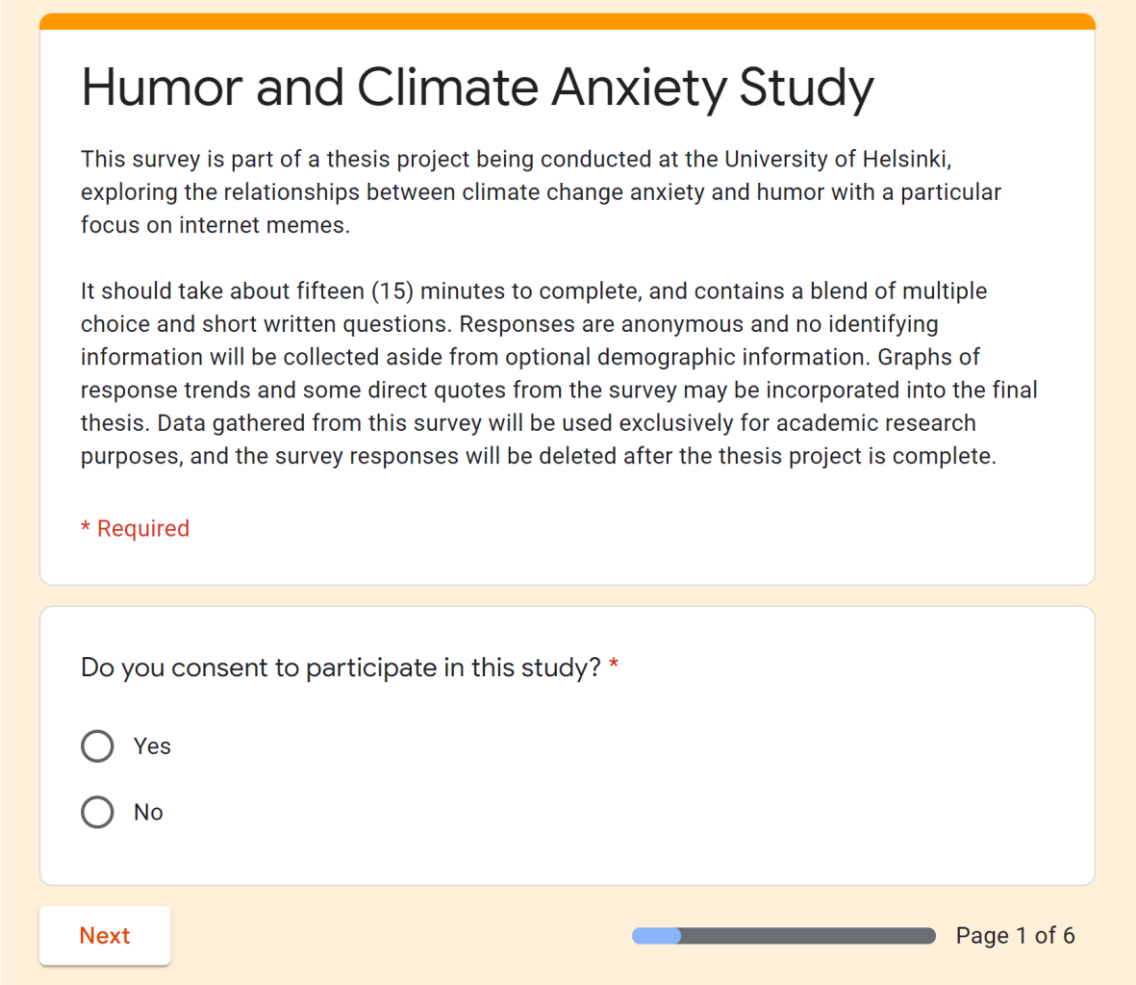
Appendices

APPENDIX 1

Part 1: Introduction to the survey // formatting



Part 2: Social Media

Definitions: For the purpose of this survey, social media refers to websites that facilitate networking and connection between people through the sharing of content, including but not limited to Facebook, Instagram, Twitter, Reddit, and others. In the context of the survey, memes refer to typically funny images, videos, etc that are copied and shared across social media platforms.

How long have you been on social media? *

- Less than 1 year
- 1-3 years
- 3-6 years
- 7-10 years
- More than 10 years
- Other: _____

Do you interact with memes on social media? *

- Yes
- No

How do you interact with memes online? *

- Browsing memes
- Creating and posting original memes on your account or to a group
- Sharing existing memes on your account or to a group
- Sending memes directly to friends
- Engage in discussions in comment sections of meme posts
- Other: _____

How often do you use or interact with memes (ie. in the ways specified above)? *

- Daily
- Multiple times per week
- Once per week
- Multiple times per month
- Once per month
- Less than once per month

Explain why you enjoy interacting with and/ or sharing memes.

- _____

Part 3: Climate Change & Anxiety

What comes to mind when you hear the term "climate change"? *

- _____

Has climate change impacted your community, city, or country of residence? *

- Responses on a scale from 1-7
- Not at all (1)
- Yes, significantly (7)

Has climate change impacted you personally? *

- Responses on a scale from 1-7
- Not at all (1)
- Yes, significantly (7)

Do you feel anxious about climate change in your own life? *

- Responses on a scale from 1-7
- Not at all anxious (1)
- Very anxious (7)

How often do you feel anxious or stressed about climate change? *

- Responses on a scale from 1-7
- Never (1)
- Always (7)

How do you cope with your feelings of climate change related anxiety or stress?

- _____

Part 4: Memes

What makes a meme funny or memorable to you? *

- _____

Have you seen any memes particularly related to climate change? *

- No
- Yes, one
- Yes, many
- I don't know

Do you make or share memes about serious topics like climate change or anxiety? *

- Yes
- No
- I don't know

Do you think interacting with climate change memes can influence anxiety levels? How? *

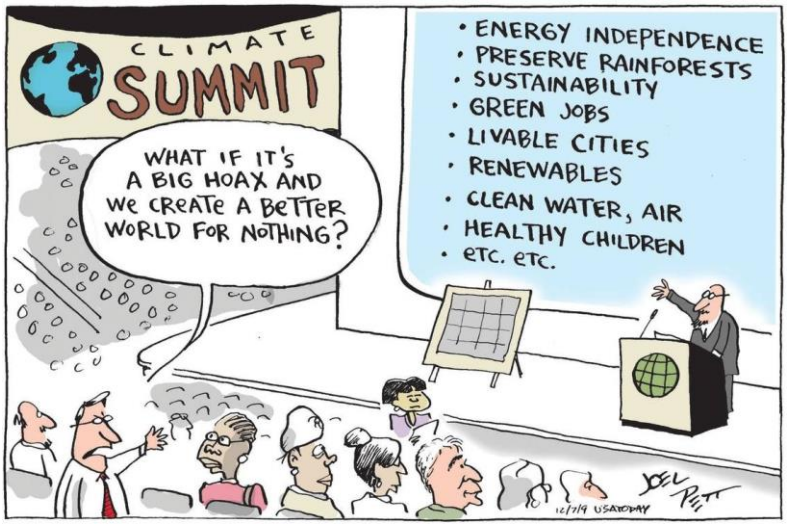
- _____

Part 5: Climate Changes Memes

Please look at (and enjoy) the following examples of climate change memes, then respond to the questions below.

1) Surprised Pikachu - Angela (2018)

2) What if it's a big hoax and we create a better world for nothing? - Joel Pett (2009)



3) This is not fine - Jackson Ryan (2019)

Which of the above memes is your favorite? *

- Surprised Pikachu (1)
- What if it's a big hoax and we create a better world for nothing? (2)
- This is not fine (3)

How did the meme you selected above make you feel? *

- _____

Who do you think the creator of your selected meme is trying to reach? *

- _____

Part 6: Demographic Information

Disclosure of demographic information is optional. If you do not feel comfortable answering one or any of the following, please select "prefer not to say" or write "n/a" in the text box.

Age *

- 19 or younger
- 20-29
- 30-39
- 40-49
- 50 or older
- Prefer not to say

Gender *

- Woman
- Man
- Nonbinary
- Prefer not to say
- Other: _____

Educational Level *

- High school diploma
- Bachelor's degree
- Master's degree
- Doctoral degree
- Prefer not to say

What country do you live in? *

- _____

If you have any feedback, please share it here.

- _____

APPENDIX 2

r/ClimateMemes

Part 2: r/ClimateMemes

How long have you been a member of the r/ClimateMemes subreddit? *

- Less than 1 month
- 1-6 months
- 6 months – 1 year
- 1-2 years
- 2+ years
- Other: _____

How do you use the subreddit? (Check all that apply). *

- Browsing memes
- Creating and posting original memes to the group
- Sharing existing memes from the group to friends
- To make friends or meet people with shared interests
- To engage in discussions
- Other: _____

How often do you use or interact with the r/ClimateMemes subreddit (ie. in the ways specified above)? *

- Daily
- Multiple times per week
- Once per week
- Multiple times per month
- Once per month
- Less than once per month

Explain why you initially joined this subreddit and what you like about being involved with r/ClimateMemes. *

- _____

APPENDIX 3


a burning hatred
of capitalism
anyone who
will listen
me


'HUMANS ARE A
CANCER TO THE EARTH'
'OVERPOPULATION'
'TRAGEDY OF
THE COMMONS'
'RESOURCE SCARCITY'
'SURVIVAL OF THE FITTEST'
ECOFASCISM
imgflip.com


Share if you think that
GENDER NEUTRAL
POTATO HEAD
Will try to ban our
wonderful fracking industry