

Master Thesis

Themes of Climate Emotions: A Qualitative Study on Individual Experiences of Climate Change and Climate Anxiety expressed in an Online Environment

Stella Francesca Scholz

Faculty of Behavioural, Management and Social Sciences (BMS), University of Twente

Positive Clinical Psychology & Technology

First Supervisor: Dr. Heidi K. Toivonen, Assistant Professor

Second Supervisor: Dr. Tessa Dekkers, Assistant Professor

Date: February 16th, 2023

Abstract

Climate change poses physical and economic threats to hundreds of millions of people and has a significant emotional impact on many, particularly young individuals. Climate anxiety, a set of emotions that adversely affect people's mental health and well-being related to the climate crisis, is widely discussed. However, there are also other complex emotions that people experience. These emotions affect individuals' daily lives and can impact efforts to mitigate climate change. Therefore, researching these emotions is crucial for understanding their impact on human well-being and agency. Using reflexive thematic analysis (RTA) to study climate emotions expressed on Reddit can provide valuable insights into how individuals perceive and discuss climate change and contribute to a more comprehensive understanding of the emotional responses to the issue. Eight broad themes of climate emotions were generated from the data through Reflexive thematic analysis (RTA), revealing a diverse range of themes of climate emotions, naming: 1. Distrust directed at a powerful outgroup, 2. Frustration directed at inconsiderate fellow humans, 3. Desperation is the most evident solution, 4. Conscientious people feel proud to take accountability, 5. Unity and determination open doors to new possibilities, 6. Believing in future solutions is essential for climate hope, 7. Guilt and shame parents take the blame, and 8. Indifference towards consequences of CC. The variety of climate emotions and interconnectedness highlight the need for more research to understand the implications of these complex emotional responses to the climate crisis for individual well-being and collective action.

Keywords: Climate change, Climate anxiety, Climate emotions, Social media, Reddit

Themes of Climate Emotions: A Qualitative Study on Individual Experiences of Climate Change and Climate Anxiety expressed in an Online Environment

Climate change, abbreviated as “CC” from now on, is one of the world's most pressing issues (IPCC, 2022). The devastating and irreversible impacts in terms of damage to human and non-human nature extend beyond natural climate fluctuations. Extreme weather conditions and their subsequent effects push natural systems and humans to their limits (Blair et al., 2006). The mere awareness of climate change and its implications can evoke extremely negative emotions in individuals (Kahn-Harris, 2021). New findings show that as many as 84% of young people around the world experience moderate feelings of negative climate emotions about CC, and 45% report problems in their everyday functioning due to such difficult emotions (Hickman et al., 2021). The growing popularity of climate anxiety (CA) as a topic of conversation in people's daily lives and the media (Murray & Taylor, 2020; Ward, 2021), warrants more empirical research using a qualitative method to gain a comprehensive understanding of the complex emotional responses to CC. Therefore, this study will explore how people express and talk about climate emotions on Reddit providing a way to understand how individuals perceive and feel about CC and how these emotions could influence individuals' mental health as well as collective actions aimed at curbing CC.

The terminology used to discuss negative climate emotions related to CA reflects the complexity of the phenomenon of CA. According to Hickman et al. (2021), eco-anxiety and CA both refer to the same thing, namely: the distress caused by the ecological crisis and CC. Other researchers investigate CA under different names, including solastalgia, solastalgic distress, environmental distress, ecological grief, climate grief, and ecological anxiety (Albrecht, 2005; Cunsolo & Landman, 2017; Cunsolo & Ellis, 2018; Higginbotham et al., 2006; Pihkala, 2020; von Mossner, 2018). CA can be conceptualised as an internal, psychological issue, which can be measured with, for example, the Climate Anxiety Scale (CAS) (Wullenkord et al., 2021), as well as a more language-mediated and social

phenomenon which is discussed and expressed on social media. Regarding the latter, the media appears to fuel CA (Nobel, 2007), and more people turn to social media platforms to share their emotions with others (Hidalgo et al., 2015). This research will take a closer look at how climate emotion discourse is expressed in an online environment to reveal and make sense of different themes of climate emotions by analysing Reddit data employing Reflexive Thematic Analysis (Braun & Clark, 2012). This thesis aims to generate in-depth knowledge to understand the diversity of climate emotions, thereby creating a broad understanding of what themes of climate emotions are expressed on social media platforms such as Reddit.

Climate Anxiety

CA can be defined in different ways; within this thesis CA is understood as consisting of a set of emotions that adversely affect people's mental health and coping skills due to their perception of CC (Clayton, 2020). However, anxiety is an emotional state meant to alert us when we perceive danger (Hickman et al., 2021). Given that CC is characterised by high levels of uncertainty and potential threat, individuals experience what can be termed “practical anxiety”. This type of anxiety can facilitate problem-solving behaviour (Pihkala, 2020), as individuals reevaluate their actions to act appropriately (Verplanken et al., 2020). Nevertheless, CC is a complex issue for which there are yet no solutions, and under these circumstances, people feel increasingly overwhelmed (Hickmann et al., 2021). Although the effects of CC are greater for individuals who experienced actual harm from CC, technically anyone aware of CC and its consequences could potentially suffer from CA (Clayton, 2017). Meaning CA can be experienced independently of one’s objective safety (Pihkala, 2021). Consequently, there is a societal need for further research to investigate verbally expressed experiences of CA and understand CA considering the huge number of potential sufferers (Pihkala, 2021).

Although existing literature on CA and other climate emotions is available, much of the work is either theoretical or quantitative. Accordingly, qualitative research is warranted to address various aspects of the complex climate crisis and the emotions related to it. For one, studying language and how people discuss climate emotions is essential to understand how people talk about and perceive CC (Dilling & Moser, 2007). Secondly, identify emotional reactions to CC, to comprehend how these emotions influence people's behaviours and actions (Hoggett, 2018; Wang et al., 2018; Whitmarsch et al., 2022). Thirdly, studying the language used to communicate climate emotions in different cultures and communities can aid the detection of differences and similarities in how people discuss and view CC, to better comprehend public attitudes and perceptions (Bezner-Kerr & Nyantakyi-Frimpong, 2015; Iniguez-Gallardo et al., 2021). Furthermore, it can provide a deeper understanding of the existence/absence of (mis)information, which can help to identify sources of misinformation or information gaps and learn how this influences individuals' views and emotions as well as political discussions about CC. (Hirsch et al., 2022; Lewandowsky et al., 2012; Matthes et al., 2023). Finally, knowing how individuals communicate and frame climate emotions may inform interventions that consider the unique emotions and needs of various populations (Bechtoldt et al., 2021; Hayes et al., 2018).

Climate Emotions

CA is a broad term frequently discussed in CC conversations; however, various emotional responses have been documented in response to CC. These emotional responses to CC have been theorised to be negative emotions, contributing to psychological distress, as well as positive ones that could serve as buffers against distress (Pihkala, 2022). Certain types of emotions documented regarding CC are sadness-related (Hickmann et al., 2021). More specifically, grief, which is not a unilateral emotion, means there are multiple ways to experience the emotion of grief (Pihkala, 2021). Individuals experiencing grief can go through

stages in which they also engage in denial, anger, bargaining, depression, and acceptance (Kessler & Kübler- Ross, 2005).

Since CC is a real threat, threat-related emotions are prevalent responses to CC as well. These include emotions such as fear (Hickmann et al., 2021), worry (Cunsolo et al., 2013), anxiety, powerlessness, and helplessness (Hickmann et al., 2021). Additionally, emotions such as guilt and shame are also known responses to the consequences of CC (Hickmann et al., 2021; Hyry, 2019). Furthermore, people who make their living working in nature, such as fishermen, hunters, and farmers, are more likely to experience severe negative climate emotions when confronted with CC and its consequences (Albrecht & Ellis, 2017). Their emotional connection with nature makes people more vulnerable and strengthens their resilience as a kind of post-traumatic growth in response to environmental change (Fraser et al., 2013). Nevertheless, concerns about the potentially disastrous consequences of CC are growing, as evidenced by public debates, which is reflected in online media coverage as well (Loureiro & Alló, 2020).

Online Environments

More scientific articles, news stories, blogs, and social media platforms are emerging and adding to public conversations about CC. According to Kryvasheyev et al. (2016), social media activity is linked to threatening and harsh weather events, such as an increase in Twitter usage associated with the economic damage caused by Hurricane Sandy. Arguably, social media can be considered a valuable source of data because it reflects the views and feelings of people from various cultural and economic backgrounds about CC and its consequences (Loureiro & Alló, 2020). Exploring climate emotions from the perspective of online environments with a qualitative method allows access to a large and diverse sample of participants and enables the researcher to study individuals' emotions and attitudes in the

context and sometimes in real-time (Loureiro & Alló, 2020). Moreover, data acquisition is cost-efficient and readily available compared to more traditional data collection methods.

There is a need for qualitative empirical research on CA and other climate emotions from an online context to gain a better understanding of the ways in which CC impacts individuals and societies (Pearce et al., 2019). Moreover, understanding how social media platforms influence individuals' views of CC can also enhance how information about CC is discussed and distributed (Mavrodieva et al., 2019). In fact, this is relevant given that research has demonstrated that (mis)information in social media platforms can cause uncertainty and mistrust in the science of climate change, potentially hindering individuals' efforts to undertake measures aimed at curbing the impacts of CC (Farrell, 2019). Further inquiry may assist in determining and addressing misleading information, biases, as well as information gaps concerning CC, allowing for the development of appropriate treatments for communities and individuals impacted by CC and related emotions (Gorman et al., 2021).

Much of the previous research on CC and associated emotions has been focused on Twitter (Anatolievna & Valerievna, 2022; Behrens, 2022), which restricts users' posts within their 280-character limit (Pearce et al., 2019). In contrast, Reddit allows for the user's posts and comments to write as many as approximately 40.000 characters. Hence, Reddit is a promising source for in-depth qualitative analysis, as more than 430 million active users add to the data (Amaya et al., 2019). Furthermore, Reddit users can operate anonymously, which allows users to share their thoughts and feelings without fear of judgement or retaliation. This can enhance the “disinhibition effect” and allow for discussing sensitive content, such as climate emotions (Kilgo et al., 2018). Within Reddit, there are possibilities to limit the scope of certain discussions to specific topics by creating subreddits symbolised by “r/” (Choi et al., 2015; Suran & Kilgo, 2017). This allows for a more targeted and focused study of climate emotions on the platform. It is estimated that around 138,000 different communities interact

on Reddit and use the platform as a forum for discussion and for supporting one another (Amaya et al., 2019).

For this purpose, Reddit seems suitable for shedding light on and making sense of the experiences of CA and other climate emotions expressed within an online context. Therefore, this thesis aims to provide valuable insights into understanding the range of emotional responses that CC can elicit in people from an online perspective. In summary, the complexity of the relationship between CC and climate emotions gives rise to directly and qualitatively investigating climate emotions discussed by Reddit users. Hence, the research question “How and what themes of climate emotions are expressed by Reddit users under the subreddit r/climatechange in an online environment?” will be answered.

Methodology

Design

Utilising a qualitative method is helpful to shed light on various themes of verbally expressed experiences of climate emotions and creating an in-depth understanding of CA from the perspective of social media platforms (Corbin & Strauss, 2014). The data collected for this reflexive thematic analysis originates from the social media platform Reddit. This particular social media platform was selected based on its accessibility and the diversity of its discussion topics. Reddit is subdivided into various subsections, so-called “subreddits”. Within each subreddits, a specific set of regulations is adhered to; different moderators ensure order, and a dedicated voting system is in place for links and own postings.

The posts reviewed in this paper were located under the subreddit r/climatechange. I read multiple posts and their respective comment sections thoroughly to filter out the most fitting ones by paying attention to whether the users expressed climate emotions with emotion words or discussed CC in a way that indicated an emotional response to it by using stylistic

devices to convey an additional or complementary meaning or feeling. To gather an adequate amount of data, I decided to not only analyse one but two different Reddit posts and their respective comment sections (see Table 1). Since all the data is gathered from Reddit, which is openly accessible and anonymous, it is impossible to obtain consent. Consequently, I cannot guarantee that everyone would have permitted consent. However, in consideration of this ethical issue, all usernames and other perhaps identifiable features will be kept confidential to ensure as much privacy as possible. Moreover, this research, with request number 221243, was approved on the 18th of September, 2022, by the BMS ethics committee.

The reflexive element of RTA encourages the researcher to reflect on their biases and preconceptions. Therefore, I would like to draw attention to the fact that I analysed the Reddit data from the perspective of a 25-year-old, white, female, psychology master's student. I was born and raised in NRW, Germany, where I lived in a single mother / working-class household until 18 when I moved to my father, who belongs to the upper middle class. My interest in environmental issues was sparked early in life by watching animal documentaries that shed light on the effects of industrialisation, CC, and loss of biodiversity. My father's boycott of plastic and discussions on microplastic impacts on seas, fish, and our health further strengthened my awareness of societal ills regarding how we interact with nature and how that might influence us. Scuba diving training also deepened my respect for the environment and connection to nature.

Materials

On the main page of the subreddit *r/climatechange*, there is a post pinned to the that reads, "I am afraid that climate change is going to kill me! Help!", which was published on 14th of February 2019. Furthermore, the original poster (OP) of this entry commented under his own post, "Let's use this space to discuss some of the most common concerns about how climate change might pose a threat to people, as well as responses to those concerns.", while

simultaneously providing more links to other CA discussions. This way, I could select two posts from the links the OP shared for analysis (see Table 1). I will analyse both posts and their respective comments. The selection criterion for the extracts to be analysed; I focused on emotions expressed in response to CC either directly or indirectly, as mentioned above.

Sources of data

Social media can be a prosperous source of data for understanding climate emotions because it allows individuals to express their feelings in a relatively unrestricted and unmediated way. Participants in the context of this thesis are Reddit users who shared their experiences of CA or other climate emotions online (see Table 1). I analysed the two Reddit posts and their respective comment sections, with an average word count of approximately 130. Fifty-two Reddit users used anonymous names, whereas twelve accounts that commented on the posts were deleted. In addition, certain accounts commented more than one time with the same name on the post due to interactions with other Reddit users.

Procedure

After deciding which posts to analyse, I copied both posts and their comment sections into a word document. Following that, I deleted all inappropriate comments for my analysis because their content was unrelated to answering the research question. Furthermore, I prepared the data in a way that protected Reddit users' privacy by removing personal information such as their workplace. Next, I transferred the prepared data to *Delve* (software to analyse qualitative data) as the analysis became more complex. The data was then iteratively analysed using the six phases of Reflexive Thematic Analysis proposed by Braun and Clark (2020). Finally, when I finalised the analysis, I reported the results.

Table 1*Overview of the Reddit posts*

Post ID	Date	Title	Post	Comments	Up-voting's
1	21 st of November 2018	Hopelessness	I am ready to check out. I am at my wit's end. I don't believe there is anything that can be done to stop it, and even if there was, capitalism, corporations, and the fucking PEOPLE wouldn't do it. We will not invent our way out of it. The people of earth are rejecting survival. Putting a fascist in charge of the largest rainforest in the world? Awesome. Using 100s of millions of gallons of water to suck dinosaur farts out of the earth? Makes sense. Positive feedback loops have made it impossible to stop, even if we wanted to. I have never been so depressed in my life. THEY (you know to whom I am referring) will always have more money. They will always have more power. I feel so hopeless. Am I the only one?	35	21
2	25 th of December in 2018	Anyone else gets depressed about climate change?	I do. I know how serious it is and I know our planet is basically toasted. Anyone feel the same? How to cope?	52	73

Data Analysis

I chose reflexive thematic analysis (RTA) to answer my research question because it allows for identifying of patterns and themes within data, which can be helpful for understanding the emotional responses to climate change expressed by Reddit users (Braun & Clark, 2012). This provides me with a broad understanding of various themes of climate emotions, which makes it well-suited to analyse the text-based expressions of climate emotions on social media (Braun & Clark, 2006). Additionally, reflexive thematic analysis allows the researcher to consider the context in which the data was collected and how this may have influenced the emotions expressed. Another feature that strengthened this decision is its flexibility and accessibility (Braun & Clark, 2006). Moreover, I chose for the analytical process to be inductive and data-driven, allowing for a thorough bottom-up approach to the analysis of a broad dataset (Braun and Clark, 2012; Varpio et al., 2019). Finally, I decided to approach language with an experiential orientation. I explore and aim to understand individuals' experiences by treating language as reflecting an individual's internal knowledge and understanding of their own reality (Braun et al., 2017).

Whilst conducting RTA, I adhered to the main six phases guiding the generation of themes from the data, as suggested by Braun and Clark (2012). RTA especially places value on its flexible and iterative nature, which made the analysis recursive rather than a rigidly followed sequence of steps (Braun & Clark, 2020). Meaning in my analysis, I was working in cycles, coming back to each of the six steps multiple times.

First, I took a close look at the anonymised posts and comments. I actively read through them, paying close attention to the different ways in which Reddit users expressed their emotions about CC and becoming acquainted with the data. Delving through the data several times ensured that I had a solid understanding of the excerpts, laying the groundwork for the following process. I began taking preliminary notes on content relevant to the study's

objective, such as a) Reddit users discussing their emotional experience in response to CC and b) direct emotion words that individuals used to express themselves. I used Delve, a qualitative data analysis software, to help me keep track of the data. After active and critical thought, I uploaded the anonymised post and comments to Delve and transferred my preliminary notes and ideas. Next, I recorded myself reading the raw data aloud along with the notes I took. I reflected on my audio tapes, which captured my initial thoughts on how people express themselves, in terms of similarities and differences regarding their emotional experiences and expressions.

In the second phase, I immersed myself in the data, scanning it for relevant excerpts and generating initial codes. Regarding my research question, the basic unit of analysis was the expressions of climate emotions shared by Reddit users in an online environment. These expressions varied in length and could be as short as one word or several consecutive sentences in a row. I coded the data paying attention to Reddit users discussing their experience of CA, being open to both direct and indirect climate emotions users shared. With direct emotions, I refer to concrete expressions of emotion words, such as “I just feel scared”. In contrast, with an indirect expression of climate emotions, I mean extracts with an emotional undertone due to the utilisation of stylistic language devices such as sarcasm and irony. For example:

“Using 100s of millions of gallons of water to suck dinosaur farts out of the earth? Makes sense” was coded with “Powerful outgroup doing something they are not supposed to do”, while noting in the audio tape that this Reddit user distinguishes himself from the others by pointing out political ills with sarcasm or irony.

I used open coding in an inclusive way, meaning, I added new codes as needed or merged codes that appeared to be too similar. Further, I constantly revised while becoming increasingly systematic when coding the data. Once I completed the coding process, I read over the entire coded material to ensure that I recoded everything in line with the latest iteration of the code set. Following that, I organised the excerpts by code into broader themes of climate emotions, which share some unifying meaning with the supporting data.

Next, I looked at the themes that I generated from the codes. In this context, themes refer to the patterns in the data that relate to the research question and organise multiple codes that capture the essence of the data. More specifically, in this thesis themes refer to the different emotional experiences and responses individuals expressed to CC. When reading again through the collated codes, I reflected on the respective abstracts to check whether they described a coherent and meaningful pattern in the data. Some individuals expressed themselves in ways that led me to code several consecutive phrases with the same code. The example below illustrates an extract from the theme “Unity and determination open doors to new possibilities” and was coded with the code “Giving advice”.

“When the situation does become dire you can always "check out". Until then, try to be part of the solution and keep enjoying the trip, use your sense of hopelessness to motivate yourself :-)!“

In contrast, other extracts of a theme were composed out of more than one code. The example below illustrates an extract from the theme “Believing in future solutions is essential for climate hope”, which consists of two different codes: “Future generations” and “Renewable energy engineering”.

“The kid you raise with love may be the one who comes up with the battery that makes an electric car with a 500-mile range for under 20 grand, or a solar cell that powers a whole house for 50 bucks, or a strain of algae that can be grown in saltwater lagoons that fixes carbon in the form of pellets and pulls carbon out of the water and the air.”

Next, I reviewed the theme and code names, comparing them against each other, the respective data extracts refining them and the definitions of the themes. After careful consideration, I came up with a distinctive and coherent set of themes, which I read once more, comparing them to the entire raw data set. Finally, I created a table sorting the themes by frequency (highest to lowest) from top to bottom, which does not imply importance in the context of this thesis. At the end of the analysis, I ended up with 93 data extracts categorised under eight broader themes of climate emotions and twenty-nine codes.

Reliability and validity are established through a reflexive engagement with theory and data interpretation while using my subjectivity as an analytical resource that shapes theme construction (Braun & Clark, 2021). Furthermore, the credibility of the results produced in this study is enhanced by an open discussion with my first and second supervisors, as well as constant revision throughout the analysis process. Furthermore, I read literature comparing my findings to previous papers' discussions of climate emotions. This type of triangulation is known to improve the trustworthiness and quality of qualitative analysis (Lincoln & Guba, 1985)

Results

Eight broad themes of climate emotions were generated from the data. Those themes are presented in the results table (see Table 2) and arranged from highest to lowest frequency in the data originating from Reddit posts and comments. Most Reddit authors expressed multiple themes of climate emotions and combined these themes in various ways. As Table 2 shows,

the most common theme was *Distrust directed at a powerful outgroup* (20 occurrences), followed by *Frustration directed at inconsiderate fellow humans* (19), *Desperation is the most evident solution* (12), and *Conscientious people feel proud to take accountability* (11).

The themes will be displayed in the same order as in the table. Since the data is completely anonymised and I also do not know which gender the original authors are, I will refer to them by randomly selected pseudonyms. The extracts will be slightly modified to enhance spelling and readability. Since all the raw data is written in English, and no one disclosed their name or age, there was no need for translation or significant adjustments to protect the anonymity of the Reddit users.

Table 2*Themes of climate emotions expressed in an online environment*

Themes of climate emotions	Definition	Primary codes	Frequency of theme expression
1. Distrust	Reddit users	- Powerful outgroup	20
directed at a	express lacking trust	doing something	
powerful	in their governments	they are not	
outgroup	because the people	supposed to do	
	in power hold a	- Powerful outgroup	
	disproportionate	lacking action to	
	amount of wealth,	mitigate CC	
	privilege and	- Economic system /	
	political power but	Capitalism	
	deliberately do not	- Inability to solve	
	use it to mitigate CC	problems	
		(Government)	
		- Big Corporations	
		prioritise profit over	
		eco-friendly actions	
2. Frustration	Reddit users express	-People do not act in	19
directed at	being frustrated by	sustainable ways	
inconsiderate	their fellow humans	-People seem to not	
fellow	because they either	care about CC	
humans	lack knowledge,	-People lack CC	
		information	

	commitment, or effort to mitigate CC	-Misinformation about CC	
3. Desperation is the most evident solution	Reddit users express being exhausted and overwhelmed by the feelings of powerlessness and hopelessness and want to give up as they see no solution/ escape from the irreversible consequences of CC	-Hopeless/ Powerless -Giving up -No solution in sight -Agreement with OP	12
4. Conscientious people feel proud to take accountability	Reddit users emphasise taking ownership of behaviours, obligations, and responsibilities to mitigate CC	- Regulating one's consumption - Taking political action - Lifestyle/ Diet - Avoiding having children as sustainable behaviour - Doing something	11

5. Unity and determination open doors to new possibilities	Reddit users express feeling united to solve a problem that has emerged in response to collective mistakes	- Shared suffering - Call to action - Giving advice - Collaborative work	10
6. Believing in future solutions is the key to climate hope	Reddit users discuss being positive and trusting regarding solutions to mitigate CC, encouraging one another to look forward to a brighter future	- Future generations - Renewable energy engineering	7
7. Guilt and shame parents take the blame	Reddit users report feeling a disabling amount of culpability for bringing children into a doomed and uncertain world	- Family planning influenced - Uncertain future - Threats due to changes in the environment as consequences of CC	6

8. Indifference towards consequences of CC	Reddit users express no emotional distress in the face of CC as they are rationalising their experience of it	- Consequences of CC as a natural process - Lack of personal control	2
--	---	---	---

Distrust Directed at Powerful Outgroups

Within this theme, Reddit users expressed mainly dissatisfaction with their governments. What predominated here was that many individuals criticised the economic/political system of capitalism, saying that it seems as if the governments enable big corporations to prioritise their profit rather than being considerate of natural systems. Further, individuals voiced that they experience politicians as failing to listen and respond to their pleas. In addition, they discuss that they feel changes to mitigate CC need to be legislated from the top down. Meaning, that the people express that they feel their actions lack significant impact to mitigate CC if big corporations are enabled by governments to systematically exploit the resources of the earth. Furthermore, individuals discuss feelings of betrayal as the legislation enables the exploitation of natural resources on a large scale, contradicting their interests. Ultimately, it can be summarised that individuals within this theme present themselves as believing that the people in power do not do what they are supposed to do, thus endangering the planet and future generations. Consequently, Reddit users express that they are feeling betrayed by their governments.

In “Sami’s” example below, it can be seen how he perceives that the interests of those elected to positions of power do not align with those of the public. Thus the interests of the powerful outgroup are perceived to be driven by egocentric and money-hungry motives.

Sami: “It's not the talk because the current generation and the people in power do not get to fill their pockets by making the world a better place for future generations...It's all self-self-self for most of the people in power. That's how they get to the top in the first place. It's the sad truth.”

Sami's example above illustrates many of the features that characterise this theme. One common phenomenon within this theme is that people refer to "the people in power" with a rather vague language (e.g., "THEM", "the government", "the elite", "corporations"). Reddit users do not clearly define who comprises that outgroup; it just becomes apparent that these individuals are perceived to have a disproportionate amount of financial resources and power compared to the ingroup, which is the Reddit users. Furthermore, he points out that those people in power do not financially benefit from protecting the earth and future generations. By saying this, it seems as if he is indicating that although he thinks this should be their motivation to govern, their real drive comes from a place of pure self-interest, as he uses the stylistic device of repetition ("self-self-self") to underline that. In addition, he does not only doubt the ethical rightfulness of the principles guiding that outgroup's behaviour but more so the entire system which allows those people to "get to the top in the first place". He summarises his dissatisfaction with the current political situation as the "sad truth".

Distrust as a prominent climate emotion resonates with previous results in which respondents indicated that 63.8% of them believe that the government does not take their concerns seriously. Additionally, 61% of the same respondents believe that governments cannot be trusted and that they are not protecting people, the planet, and future generations as they should (Hickmann et al., 2021). The betrayal people experience in the face of governments' inadequate responses increases their distress further and hinders the uptake of policies aimed at mitigating CC (Rafaty, 2018).

Frustration Directed at Inconsiderate Fellow Humans

Within this meaning-making pattern, Reddit user express frustration towards their fellow humans' careless attitudes and behaviours. Furthermore, conversation participants express feeling frustrated as they communicate their perception of being left alone by their

fellow humans to mitigate CC. Within this theme, individuals discuss how others lack knowledge of how CC should be understood and consequently approached, with divided opinions on the conceptualisation of CC. Some argue it is a “political problem” whereas others insist it is “an engineering and economic issue”. While further reading through the data, it became apparent that individuals who express that they perceive themselves as behaving sustainably experience “resentment for people that aren't doing the same”. Prevalent within this theme is that Reddit users express themselves as being repelled by the consumerism that characterises this society, explicitly referring to the generation of Millennials. Others share this impression, pointing out that people will not make sacrifices as this is too much of an inconvenience, illustrating the anger at the inability of our society to compromise to mitigate CC.

The following example of “Jussi” illustrates the incomprehension of the unsustainable behaviour of his fellow humans and the accompanying frustrations directed at them.

Jussi: "Just yesterday I was with my flat mate at the supermarket, and we looked at each other when the people in front of us bought a paprika in a packet (plastic), they bought 4 of these. Seriously, do we need this?"

Jussi asks an unspecified number of people (we) to rethink their behaviour in a more environment-friendly way. The word "Seriously" in the following question is used as a rhetorical device to underline how much this action disappoints and frustrates him. The use of the word "need" indicates that the speaker thinks the use of plastic is pointless. He employs anaphora by writing "we" and "they," implying a contrast between the speaker and the people in front of them, emphasising the speaker's differing views and attitudes towards the issue of plastic waste. Furthermore, it seems as if he validates his perception of the perceived violation

of the social norm to behave in environment-friendly ways by paying attention to whether his roommate's reaction would confirm his assessment of the situation. Looking at each other is a nonverbal way of communicating agreement. The purpose of sharing this particular detail with Reddit users seems to suggest that Jussi is not alone in his feelings of frustration about the use of plastic wrappers. In outlining the common emotional reaction with his roommate, it seems that he is also attempting to engage with other users who may have similar thoughts/feelings regarding the use of plastic. It can be said that the essence of this theme is also reflected in the emotions and beliefs of other populations, as 82.6% of Hickmann et al. (2021) sample reported believing that the people of earth have failed to take care of the planet and 56.8% experienced the feeling of anger.

Desperation Is the Most Evident Solution

Within this theme, Reddit users discuss worries and feelings of hopelessness and powerlessness, which led individuals to describe feeling exhausted and willing to give up. Within this theme, people talk about how they come to terms with the irreversible environmental damage, recognising “our planet is basically toast”. Moreover, Reddit users discuss how they perceive no way out and would instead surrender than further suffer under the perceived threats that come along with CC. Striking is also that the conversation agents within this theme write in coarse language to express displeasure saying things such as “We’re fucked”. Furthermore, individuals discuss that they perceive themselves to lack control within their complex situation, which is influenced by many outside factors. Another feature which is common within but unique to this theme is that individuals seek reassurance by asking other people online whether they encounter similar feelings.

The example below from “Ada” illustrates how the perception of one’s (in)ability to efficiently mitigate CC is influenced by different factors and that, in the case of a negative appraisal, it can generate feelings of despair.

Ada: “I am ready to check out. I am at my wit’s end. I don’t believe there is anything that can be done to stop it [...] We will not invent our way out of it. The people of earth are rejecting survival [...] Positive feedback loops have made it impossible to stop, even if we wanted to. I have never been so depressed in my life. [...]I feel so hopeless. Am I the only one?”

In Ada’s example above, she writes in relatively short sentences, thereby enhancing the accessibility of the points she is making, thereby evoking the impression of a sense of hopelessness and resignation. Further, the use of words such as "wit's end", "rejecting", "impossible", "depressed", and "hopeless" indicate Adas's negative attitude and feelings. The use of the phrase "check out" implies that the speaker is considering giving up or disengaging from the situation, which is common in this theme. Ada also poses a rhetorical question, "Am I the only one?" at the end of the statement, suggesting his/her sense of isolation and the potential that others will not be able to understand or relate to them. This characteristic feature of feeling isolated is not unique to this theme but can also be found in the theme “Frustrations directed at inconsiderate fellow humans”. Overall, the references to "positive feedback loops" and "people of the earth" suggest that Ada recognises environmental and societal concerns, as well as their complexity and interconnectedness. Furthermore, this seems to be in line with previous research, which suggests that some individuals consider efficient mitigation measures against CC to be impossible when confronted with factors out of their control, such as in Ada’s case, the positive feedback loops (Lertzman, 2019; Tollemache, 2019)

Conscientious People Love Accountability

The theme of accountability was generated as Reddit users discussed that they perceived themselves to have control of their actions and present themselves as deliberately using those to mitigate CC. Within this theme, individuals expressed believing that although others might have more power, one should use one's own power to create the reality one is striving for. People describe their attempts to reduce their distress by taking ownership of their behaviours, obligations, and responsibilities and actively making sustainable decisions that they perceive to decrease the acceleration of CC. They write about how they express their accountability by consciously regulating their consumption, taking political action, or making lifestyle choices such as becoming vegan or vegetarian. Within this theme, people construct their responsibility for their mental well-being and mitigate CC to be mainly dependent on themselves and not on other influences, which they reported helped them relieve their anxiety. Interestingly, some individuals seemed to perceive environmentally friendly behaviour as some kind of higher calling, referring to it as "the work we have been given to do in this world". In contrast to other themes, within this theme, the choice of words and tone in which Reddit users address each other is less reproachful. They offer each other options for how people could engage themselves more to mitigate CC without placing direct pressure on the other individuals. Despite their willingness to take accountability, it seems as if the Reddit users within this theme have a precise idea of what environmentally friendly measures are within their means and what is considered "too much" or "too costly".

In the following example below, "Noomi" shows that she perceives everyone, including herself, as being able to mitigate CC by being accountable for one's behaviour.

Noomi: *“Yes, it is depressing. However, we can do something about it. Everyone can try to reduce the energy they use, vote for politicians (of either party) who do not think that climate change is a hoax but are willing to do something about it (carbon tax, reduction in fossil fuels, etc.), and support carbon-free energy production.”*

The use of simple sentence structure conveys a sense of immediacy and clearness. The choice of a simple sentence structure conveys a sense of clarity and directness. The inclusion of the conjunction "however" demonstrates the difference between the speaker's acknowledgement that CC is depressing and Noomi's conviction that something can be done about it. This way, she validates other Reddit users' negative feelings and perceptions of CC without claiming to feel the same. Words like "reduce," "vote," and "support" express the speaker's belief in the effectiveness of individual and collective actions. Noomi offers her point of view by saying, “we can do something about it” the “we” seems to refer to an unspecified number of people. However, technically, she refers to everyone, as the following sentence indicates. As “doing something” is rather unspecific, she continues to provide different ways in which individuals can take action to mitigate CC. While it becomes apparent what she seems to believe are appropriate steps to mitigate CC, she still leaves it open for other people to make their own decisions by using “can do” rather than “must do”. Moreover, another feature that is relatively common within this theme is that individuals advise others to “try to reduce the energy you use” without providing more specific advice on how this objective could be reached. The phrase "everyone can try" seem to presuppose that Noomi considers individual actions to be important, which resonates with the “Individual agency” theme from the research of Toivonen (2022). Furthermore, specific examples like "carbon tax" and "reduction in fossil fuels" suggest that the speaker is well-versed in climate issues. Finally, the phrase "of either party" is used rhetorically, inferring that Naomi

considers CC a non-partisan issue and that actions should be taken regardless of political affiliation.

Unity Opens Doors to New Opportunities

What unites the people are their perceptions of shared suffering as part of the human condition in response to the consequences of CC, which emerged as the result of collective mistakes cumulated over generations. Further, within this theme, Reddit users talk about perceiving themselves as capable of mitigating CC, just as prior generations were also able to manage other complex but “equally horrifying” issues. Within this theme, individuals discussed coming to acceptance with the development of how far CC has evolved, which they say allows them to think in more rational rather than emotional ways. Their conversations are more solution-focused, thereby seeking to elevate the mood of others. This theme is characterised by individuals speaking words of encouragement and motivation, calling their fellow humans to action, and giving advice on how to best deal with the situation. Central to this theme is that CC must be solved collectively, as it also emerged from collective mistakes.

In the example below of “Odin”, it can be seen that, on the one hand, the perception of unity and togetherness can elevate one's readiness and motivation to act. However, on the other hand, it could give a false impression that everything is going to be fine once people decide to address CC collectively.

Odin: “Of course, it's frightening but human beings have always faced tough stuff. How do you think people felt in the 1340s when a third of the world died from Bubonic Plague? They carried on, one way or another. This is a serious problem, but WE CAN FIX IT. We just need to get policymakers, investors, corporations, and governments on the same page and MOVE.”

Parallel structures like "It's scary, but people have always struggled with difficult things" and "This is a serious problem, but WE CAN SOLVE IT" appear to illustrate opposing thoughts and feelings about the complexity of the problem and Odin's conviction in the ability to deal with it. The excerpt from Odin is characterised by casual language as he loosely refers to CC and the most fatal pandemic in human history as "tough stuff". The comment regarding Bubonic Plague suggests that he is informed of past precedents of humanity dealing with and surmounting tough challenges. His exuberant style of expressing himself online distinguishes him from other individuals within this theme. Words like "frightening," and "serious" seem to express the speaker's comprehension of the gravity of the circumstance. Words like "fix" and "move" may suggest his confidence in the efficacy of behaviour aimed at curbing CC. Including the modal verb "can" could indicate that Odin believes the issue is fixable. The imperative "MOVE" appears to suggest a call for action. Furthermore, the pronoun "WE" implies that the speaker and other Reddit users are a collective group, emphasising the significance of joint action. To elicit empathy and make the audience reflect on humanity's ability to overcome difficult situations, rhetorical prompts such as "How do you think people felt in the 1340s" are employed. However, this type of motivational discourse needs to be critically reflected on in a larger context. Assuming that "we can fix this" by "just" getting "everyone on the same page" seems to drastically reduce the complexity with which CC needs to be addressed. Consequently, such motivational discourses are to be handled with caution as they could induce the false impression that CC can be mitigated easily, thereby creating a false sense of security. These socially constructed risk perceptions can lead to complacency and a lack of urgent action, which is necessary to mitigate the effects of CC (Davis et al., 2016; Leiserowitz, 2006).

Believing in future solutions is the key to climate hope

Within this theme of climate emotions, people present themselves as having a positive and hopeful outlook and trusting in the capabilities of their fellow humans to come forth with solutions to mitigate CC. Individuals talk about possible solutions and present themselves as trusting that renewable energies will dominate fossil fuels one day as natural resources replenish faster than they are consumed and are free. Moreover, people within this theme speak highly of the current engineers whom they perceive as continuously striving to mitigate CC. Additionally, they present themselves as trusting in future generations. Furthermore, they express appreciation for science and the know-how generated through it, which they think will increase over time. Interestingly, almost everyone within this theme presents themselves as being informed about either renewable energy engineering, electric cars, or the state of art of science to some extent, allowing them to form an opinion about the feasibility of possible solutions to mitigate CC. Reddit users within this theme discuss how acquiring knowledge about CC has helped them reduce the CA they experienced. Within this theme individuals on Reddit encourage one another to look forward to a brighter future by presenting themselves as hopeful and optimistic regarding future solutions, which often arose in response to the acquisition of new scientific knowledge.

The example below of “Niko” represents the theme “Believing in future solutions is essential for climate hope”.

Niko: “I’m employed as an assistant professor in biotechnology and have been using my network (both academic and industrial) to start getting traction on idea’s that could be both financially interesting and significantly help us reach our goals to keep the climate stable. I’m a firm believer that when sustainable technology becomes profitable the transition will go automatically. Looking at how competitive science can be, it comforts me to know that all over the world clever scientists are doing the same thing! Last but

definitely not least, keep in mind that the future challenges regarding climate seem impossible to solve from our current perspective. Advancements in science are accelerating almost exponentially as we keep building on acquired knowledge."

Nikos's example above represents the theme "Believing in future solutions is essential for climate hope" because it includes all the characteristic features that individuals within this theme discussed. Niko begins by revealing his profession so that the other users understand what background knowledge he bases his opinion on. Furthermore, the speaker's position as an assistant professor of biotechnology, as well as the use of the phrase "acquired knowledge" imply that the speaker has a thorough understanding of the field and the progress that has been made. Interestingly, many Reddit users within this theme presented themselves as informed about CC. The choice of statements like "firm believer," "profitable," "transition," "clever," and "exponentially" seem to express Nikos's confidence and hopeful attitude in curbing CC. Unique to this theme is that Individuals discussed the financial aspect of possible measures to mitigate CC, which was not present in the other themes. Niko, as well as the other Reddit users, discuss being hopeful regarding "sustainable technology" becoming "economically dominant" and thereby creating a change with which CC could be possibly mitigated. Another characteristic feature of this theme is that Individuals present themselves as perceiving science as trustworthy, which stands in contrast to other themes (Distrust, Frustration) in which science denial and misinformation were described as "depressing".

Moreover, Niko says he finds relief in knowing that science is competitive. The positive assessment of the capability and efficacy with which CC can be addressed in the future is central to this theme. Another aspect that has not been mentioned in other themes, is time. He reminds his fellow humans that it only seems "impossible to solve from our current perspective", this way of formulating things could lead individuals to reappraise the situation

from another angle, which is unique to this theme. Thereby, he gives individuals the opportunity to reevaluate the situation not based on their current knowledge and resources but rather on future advancements, making a positive evaluation of the circumstances possible. Furthermore, the phrases "last but not least" and "keep in mind" are used to emphasise his points' importance and encourage the audience to remember them.

Guilt and Shame Parents Take the Blame

Within this theme, Reddit users write about perceiving the world as threatening and uncertain presenting themselves as being (in)directly confronted with the consequences of CC. People within this theme describe realising to which circumstances, they might expose their (future) children and describe experiencing intense feelings of guilt. Multiple Reddit users stated that due to those circumstances or to avoid such, they will try to not procreate either as a form of sustainable behaviour or because they perceive the future to be too gloomy to expose children to. Some Individuals describe their guilt and shame as so overwhelming that they describe experience decreased functionality in their everyday life. The severity of CA symptoms such as pathological worry, which is described by people within this theme is unique in the sense that in other themes symptoms of CA are described to be less severe or not present at all. Individuals further express that they are overburdened with the situation as they don't know how to break down the complexity, urgency, and importance of CC to their children. Furthermore, the experiences of guilt and shame are not only discussed regarding one's offspring but also regarding environmental changes and damage to flora and fauna as a consequence of CC. Reddit users present themselves as realising that CC has irreversibly changed the nature of diligent ecosystems. Consequently, it can be summarised that within this theme, Reddit users express care for something or someone and out of a negative self-evaluation, the emotions of guilt and shame emerge.

Kirsi: *“I know how you feel. I have a 4-year-old and I am terrified for him and feel guilty for bringing him into this world. It's consuming my life.”*

The example of Kirsi above offers insight into the theme of “guilt and shame parents take the blame”. In Kirsi’s first sentence, she answers the OP, who asks, “Anyone else get depressed about climate change? “, stating that she knows how he/she feels, implying that he/she either feels that way right now or has felt that way in the past. She continues by revealing that she has a 4-year-old child. She says, “I am terrified”, this appears to be interesting because she does not describe a feeling, which comes and goes, but rather a state in which she is in, the state of extreme fear. Further, she continues by stating that she feels guilty for bringing her son into this world, something that she cannot undo, and must live with under the conditions this world provides, including the ever-present threat of CC. The last sentence I perceive as significant and telling when gaining insight into her perspective and the broader theme. “It’s consuming my life”, with “it’s” I assume she refers to the circumstances of being responsible for exposing her child to CC. However, even more, interesting is her choice of words to describe the situation as “consuming”. The word “consumed” itself seems to imply that her whole life, mind, and attention are absorbed by feelings of guilt. I chose this extract to represent the theme because it illustrates how, out of deep love and care for something or someone, very intense negative climate emotions such as guilt and shame can arise, which are central to this theme. This seems to resonate with prior research, as worries about the well-being of one’s offspring and future generations seem to be universal and appear to have correlations with anxiety about CC (Ekholm & Olofsson, 2017). Essential to this theme was that people worried their (future) children will face actual threats to their physical health. Such concerns align with findings from a sample showing that as many as

51.7% of the participants fear that their family's security will be threatened economically, socially, or physically because of CC (Hickmann et al., 2021). Moreover, approximately half of the same sample indicated experiencing climate emotions of guilt and shame, and 39.1% of the individuals feel hesitant to have children because of negative emotions and beliefs about CC (Hickmann et al., 2021).

Indifferent towards the consequences of CC: Coping or Genuine Feelings

Within this theme, individuals present themselves as not emotionally affected by CC and its consequences. The reasons why individuals within this theme discuss negative climate emotions as unnecessary differ among themselves. One Reddit user shared that he dismissed his/her climate emotions as he/she had the impression that it would not make sense to feel “depressed about something that you cannot control anyway”. The two users differentiate each other from one another in the way that one of them expressed that he has had some negative climate emotions but then came to the realisation that discarding them would be a logical consequence as he/she lacks control. Whereas the other one stated his indifference regarding this topic, which seems to be his initial emotional reaction to and view of CC. The unifying feature within this theme is acceptance of what has happened and of what is to come, leaving individuals within this theme with no significant emotional responses to CC.

The example below of “Levi” illustrates how Reddit users within this theme perceive themselves as emotionally unaffected in regard to CC.

Levi: “I’ve been studying climate change at uni and I have to come the conclusion that it’s all good. The planet will be absolutely fine, but it will become inhospitable for human life sooner or later. But we’re all gonna die sooner or later anyway so why worry...? It’s just evolution, everything dies out eventually and another mass extinction

is no big deal. Climate change is just the new doomsday obsession that humans seem to need. All civilizations die out eventually, it ain't no biggie 🤔 (and beside the point, humans and animals alike are more likely to die from a car accident than climate change)”

Levi presents himself as being informed and educated on the topic of CC, and thereby justifies his conclusion “that it's all good”, without giving specific reasons as to why he came to this conclusion. He continues by clarifying that his conclusion refers exclusively to the well-being of the planet, saying “everything will die out eventually”, thereby implying that human extinction is part of the natural process of evolution and therefore not scary but rather expected. This suggested non-urgency to act is central to this theme. Further, he continues by trying to reinforce his argument by posing a question with an unrelated fact. This seems as if he tries to get the approval of other people by making them agree to “we're all gonna die sooner or later” to then draw incorrect or unrelated conclusions such as “if we die anyways why worry about the planet right now”. This view is especially critical as it seems to imply that not taking any kind of action to mitigate CC is not only okay but also perhaps wanted as “another mass extinction is no big deal”. It gives the impression that he wants CC to not be perceived as a threat, as he minimises the urgency and complexity of the issue by reducing CC to “the new doomsday obsession that humans seem to need”. Ultimately, he seems to try to gain some trustworthiness by pointing out that “humans and animals alike are more likely to die from a car accident than climate change” presenting this alleged statistical fact, to convince other Reddit users of the non-hazardous of CC. Although, feeling indifferent towards CC and its consequences is a climate emotion that has been established in other populations as well, like, in the sample of Hickmann et al. (2021), where 29% of the sample indicated that CC makes them feel indifferent, the way feelings of indifference are laid out

within this theme deserves to be critically reflected on. The reason why I chose Levis's excerpt to represent this theme is that the way it minimises the complexity and urgency with which CC needs to be addressed is dangerous in the sense that it could possibly undermine any attempts aimed at mitigating the effects of CC.

Discussion

In this thesis, two Reddit posts and their respective comment sections were analysed utilising Reflexive Thematic Analysis. As a result, eight broader themes of climate emotions are revealed, involving a rich variety of emotions which go beyond the predominant climate emotions currently discussed in the literature. In the following paragraphs, I will review the main findings considering preexisting literature and offer some ideas for future research.

The results of this study are comprised of eight broader themes of climate emotions, revealing a diverse range of emotional responses to climate change (CC) on Reddit, including both positive and negative emotions. The findings suggest that emotions in response to CC are more diverse than previously thought, with four themes being negative (Distrust, Frustration, Despair, Guilt/ Shame), three being positive (Accountable, United, Hope), and one being neutral (Indifferent). This recognition that emotions in response to CC are more diverse than previously thought is one of the major findings of this study that have several implications for the climate debate. Firstly, this could contribute to a more nuanced and comprehensive understanding of emotions experienced in response to CC. Acknowledging that a variety of emotions associated with CC, such as distrust, frustration, hope, and despair, can aid in understanding the attitudes, motivations, and behaviours of emotionally affected individuals (Brosch, 2021). This can assist in effectively personalising interventions to diverse audiences with different needs (Patchen, 2006). Furthermore, it has the potential to contribute to more inclusive and effective policymaking (Wang et al., 2018). Realising and

responding to the fact that various groups of individuals may react differently to CC can assist with ensuring that measures are inclusive and responsive to the needs of all affected communities, because there is no “one fits all” approach when addressing CC (Leiserowitz & Smith, 2014; Markowitz et al., 2021).

The theme “Distrust directed at powerful outgroups” was the most common one in this analysis. Within this theme, people voiced feeling betrayed by their decision-makers due to political inaction regarding CC measures. This is consistent with the work of Weintrobe (2021), who contends that citizens have been swindled by a "climate bubble" culture that avoids taking accountability for CC. Additionally, this theme aligns also with prior findings in which young people expressed being “frustrated by unequal power, betrayed and angry, disillusioned with authority, drawing battle lines.” (Jones & Davison, 2021). Overall, it can be said that feelings of distrust and betrayal towards powerful outgroups are central to many experiences of CC and discussions surrounding it. However, such perceptions of corrupt governments and corporations are counterproductive to the goal of mitigating CC, due to decreasing support for climate policies (Rafaty, 2018). To conclude, this theme highlights the importance of addressing perceptions of power imbalances and mistrust, particularly about the role of large corporations and governments in causing and addressing CC to effectively engage individuals with the climate crisis (Hickmann et al., 2021). This is important because research has already shown that individuals are more likely to act in pro-environmental ways in response to perceiving companies as behaving socially responsible (Hameed et al, 2019). In previous literature on climate emotions, less attention has been given to feelings of betrayal. Therefore, more exploration is warranted to better understand how distrust against governments shape people's emotions and sustainable actions.

The results of this study indicate that certain themes, such as Distrust and Frustration, were found to be interrelated, with users expressing combinations of both emotions in their

comments. This observation is in line with previous research about climate emotions being composed of different feelings, which manifest together (Lewis, 2016). E.g., “I do not understand how this is not the #1 priority for every sector of the government and the rest of the world.”. Future research should be aimed at understanding the co-occurrence of emotions to provide insight into the underlying psychological mechanisms that drive these emotions, which could inform interventions aimed at regulating negative climate emotions.

Furthermore, this might also indicate that emotions are interconnected and need to be addressed as such to impact behaviour change. Consequently, more research is warranted to fully understand the complex interplay between emotions, social relations, and sustainable behaviours to curb CC (Uzzel & Rätzzel, 2009).

The theme “Frustration directed at inconsiderate fellow humans” was characterised by a combination of descriptions of angry and anxious attitudes, which comes not as a surprise knowing both constitute and are closely related to frustration (Pihkala, 2020). Individuals verbally expressed frustration towards those who don't follow eco-friendly behaviours, anxiety from feeling like they must mitigate CC alone and frustration due to the realisation that their goal to mitigate CC cannot be reached under these circumstances. Generally, feelings of frustration and isolation are commonly experienced in response to CC and have been extensively outlined in previous research (Hyry, 2019; Marczak et al., 2021; Verlie, 2019). For example, 44% of the people in the Finnish national climate feelings survey indicated experiencing climate frustration and 44% of the people in an American survey reported experiencing even stronger climate emotions, such as anger (Hyry, 2019; Smith and Leiserowitz, 2014). In consideration of the fact that climate frustration is experienced to different extents ranging from frustration to anger to rage, scholars such as Antadze (2020) propose further research to better distinguish between those climate emotions. Moreover, a rather novel finding is the specific aspect of feeling left alone and isolated to mitigate CC

(Verlie et al., 2020). This resonates with previous research in which individuals reported similar feelings in response to fellow humans dismissing the validity of CC and others accompanying difficult emotions (Kretz, 2017). Additionally, this theme highlights the importance of addressing the societal norms and values (capitalism, consumerism) which shape attitudes and behaviours towards CC. A societal norm that values economic growth and consumerism may lead individuals to prioritise short-term gains over long-term environmental sustainability (Fernandes et al., 2021). Future research should explore how to address and change these norms and values on a societal level, to work towards creating a culture of “care” as Weintrobe (2021) might would say, prioritising sustainable practices and the health of the planet and its inhabitants, thereby mitigating and adapting to the impacts of CC.

Next, the theme of "Desperation is the most evident solution", which was also interrelated with the themes of Distrust and Frustration, as exemplified by the statement "This, and the other parts of science denial, have gotten me really depressed. People all over I see keep saying science is all fake or it's all part of a globalist money-making scheme. It's so disheartening that I just want to give up. To quit and just not care about anything anymore. I hate it." The theme "Desperation is the most evident solution" is characterised by feelings of powerlessness and hopelessness, commonly associated with eco-anxiety (Pihkala, 2022). Notably, a novel finding contributing to the advancement of knowledge in this field is that users expressed a readiness to give up and disengage due to feeling exhausted and overwhelmed by difficult climate emotions. This highlights the severity of the issue and the need for immediate action and effective solutions that can alleviate feelings of hopelessness and despair. It also implies a lack of agency or power among individuals in addressing CC, emphasising the importance of providing opportunities for individuals to act regarding the

underlying social (e.g. “science denial”) and political issues (e.g. “a globalist money-making scheme”) that may contribute to feelings of desperation.

The theme "Guilt and shame parents take the blame" highlights the emotional burden that individuals may experience because of their perceived role in contributing to CC and its impacts. This theme specifically relates to feelings of guilt and shame related to the potential harm caused to future generations and the loss of biodiversity. This seems to resonate with findings from Hyry's Finnish National Climate Emotions Survey (2019), in which 24% of the respondents indicated experiencing climate guilt, and a further 18% recognised climate shame in themselves. While guilt has been more widely studied and discussed in relation to CC, shame is also an important emotion that is present in the emotional experiences of individuals dealing with the ecological crisis (Aaltola, 2021; Orange, 2017). However, research on shame specifically has been less emphasised, highlighting the need for further examination of this emotion in the context of CC (Phikala, 2022). Overall, this theme emphasises the importance of addressing personal responsibility for CC and feelings of guilt and shame. The combination of these two emotions is also referred to as “guilty conscious”. Research showed that such moral emotions can elicit individuals to engage in pro-environmental behaviour, which could potentially be used in future interventions to reevaluate and use these emotions in a more healthy and productive way (Bamberg et al, 2015).

To summarise, while it is important to acknowledge and validate the emotional responses individuals may have to CC, it is also emphasised to avoid pathologising these (Barnwell et al., 2020). This is because negative climate emotions are a common and comprehensible reaction to a challenging and potentially dangerous situation (Phikala, 2022). Consequently, these emotions should be viewed as a call to action to address the underlying social and political issues that are contributing to the climate crisis (Hickman et al., 2021).

Research on negative emotions related to CC such as anxiety, fear, and hopelessness is more common and well-established in the field (see Ojala et al., 2021), while research on positive emotions is less prevalent (Frederickson, 2004). This is because negative emotions are often linked to the risks and challenges of climate change, while positive emotions are linked to opportunities and solutions (Borsch, 2006; Clayton, 2021). Despite this, new findings on positive emotions can provide valuable insights into how to harness them to support a sustainable future.

In the context of this thesis, it can be said that some Individuals expressed their emotional responses to CC in a way that suggested Reddit users experience a combination of both positive and negative emotions. This can be best exemplified by an extract from the data:

“Honestly, I'm with you: We're fucked. But, then you have to decide what to do with your life and I think I'd like to think, even if it's probably a lost cause, it's a cause worth fighting for. Do what you can. We could stop, but I don't believe we will.”

The extract appears to indicate feelings of despair (“*We're fucked*”) followed by a shift in attitude towards hope and a sense of unity (“*Do what you can*” and “*it's a cause worth fighting for*”). Overall, the use of language in this extract conveys a complex and nuanced, but also rather contradictory set of emotions and thoughts related to CC. This resonates with prior research in the way that individuals' emotional responses to CC can be complex and multifaceted, often involving inconsistent feelings and thoughts about CC (Hoggett, 2019).

The theme of “Believing in Solutions is the key to climate hope” is characterised by the presence of words and phrases that seem to convey hopefulness, optimism, and empowerment. This theme suggests that individuals have trust in the capability and willingness of their fellow humans to find solutions that will mitigate the impacts of CC.

Research has established a link between individuals' sense of optimism and hope and their likelihood of engaging in pro-environmental behaviours (Gallardo, 2013; Ojala, 2012). Additionally, studies have shown that messages that emphasise the feasibility and desirability of solutions to CC can be more effective in motivating individuals to act than messages that solely focus on the negative impacts of CC (Pelletier & Sharp, 2008). Therefore, this theme can be considered as an important contributor to the discourse surrounding CC, as it highlights the potential of positive emotions and message frames to enhance pro-environmental behaviour (Baden, 2019). However, it is important to note that further research is needed to differentiate and define the terms "climate hope" and "climate optimism" to more accurately distinguish between individuals who feel climate optimism and those who feel climate hope (Ojala, 2017; Pihkala, 2022).

In the theme "Conscientious people feel proud to take accountability" people present themselves as accountable actors who perceive themselves as in control of their actions and able to mitigate CC. Individuals seem to have a clear idea of what kind of actions they and others can take to mitigate CC. Often, however, rather vague environmentally friendly measures such as "reduce consumption" and "go vote" are suggested, and only a few suggestions are concrete enough (e.g., a vegan diet) to be able to say that they contribute to curbing CC, this resonates with findings from Toivonen (2022). Moreover, individuals seem to have a precise idea of what environmentally friendly measures are within their means and what is considered "too costly", which is also in line with previous research (Robinson, 2019). The theme of "Conscientious people feel proud to take accountability" stands out among positive climate emotions on Reddit as it highlights individual actions to mitigate CC, rather than emphasising collective action as seen in other themes ("Believing in Solutions is the key to climate hope" and "Unity opens Doors to New Opportunities"). Research that made similar observations includes a study on the role of agency in addressing CC, such as the

“Individual agency” (Toivonen, 2022). Moreover, pride as a climate emotion could also be harnessed to increase pro-environmental behaviour aimed at mitigating CC because previous research suggests pride to have a motivational function despite potential costs for oneself (Desteno & Williams, 2008).

The theme “Unity opens Doors to New Opportunities” illustrates how some people experience a sense of togetherness in the face of the climate crisis. Individuals within this theme outline the importance of pulling together to have a chance to mitigate CC. Such feelings of unity can cause people to feel “positively overwhelmed by the idea that together they can make a difference” (Landmann & Rohmann, 2020). Furthermore, ecopsychologists such as Stoknes (2015) point out that a sense of belonging and connection to something bigger is a fundamental underpinning of concern about the climate crisis. This idea aligns with the theme "Unity opens Doors to New Opportunities ", emphasising the significance of feeling connected to a shared cause in addressing the issue. This connection can play a crucial role in motivating action regarding CC by providing a sense of purpose and shared responsibility (Stoknes, 2015). The example of Odin shows how certain motivational discourses may present an oversimplified view of the complex issue of CC. These kinds of narratives could potentially result in counter-productive outcomes for actions aimed at mitigating the effects of CC. Thus, the climate emotions of belonging, connection, and perceived unity should be harnessed to promote a sense of community in the discourse on CC, which may increase engagement and support for pro-environmental behaviours (Bouman et al., 2021).

The theme “Indifferent towards the consequences of CC” was characterised by individuals presenting themselves as being emotionally unaffected by CC and the consequences that came along with it. The example of Levi could be perceived as an attempt to dismiss the validity of the negative and distressing climate emotions other Reddit users

shared. Such attempts are also known to include ignoring, disavowing, rationalising, or dismissing other people's difficult climate emotions (Weintrobe, 2021). These attitudes are especially dangerous to the goal of mitigating CC because not only do anonymous individuals on Reddit seem to have to say something about the appropriateness of other people's climate emotions, but even politicians with a supposed role model function join this discussion publicly. Mosquera and Jylhä (2022) draw attention to how influential politicians like Trump and Putin responded to the Greta Thunberg speech (see World Economic Forum, 2019). Trump dismisses the validity of Greta's climate emotions by tweeting, "*So ridiculous. Greta must work on her Anger Management problem, then go to a good old fashioned movie with a friend! Chill Greta, Chill!*" (Trump, 2019). Weintrobe (2021) warns that such behaviours, particularly when carried out by adults or governments, have the potential to foster a culture of carelessness. This highlights the need for awareness and knowledge on how to responsibly respond to and manage climate emotions, which should be viewed not only in the context of the climate crisis but also in the context of social and political discourse. Furthermore, Levis's example is characterised by some sense of morbid wit, which might sound alarming at first, however, studies have demonstrated that emphasising ease and humour surrounding CC discussions can lead to increased engagement and belief in CC, even for individuals who dismissed the relevancy of the climate crisis before (Anderson & Becker, 2018).

One of the strengths of this study is the use of qualitative methods, specifically RTA, to gain an in-depth understanding of the emotions experienced by individuals regarding CC. Furthermore, by conducting the study with data from Reddit, I was able to reach a large group of individuals who are actively engaging in discussions on the topic, providing a rich source of data. Additionally, the research also adds to the existing knowledge of climate emotions by highlighting the interconnectedness of emotions and the different social and political factors that contribute to them. Overall, the research makes a valuable contribution to previous

scientific literature on climate emotion research by shedding light on the diverse range of emotions experienced in relation to CC and the importance of considering these emotions when designing interventions aimed at mitigating the impacts of CC.

However, the study's findings must be viewed considering some limitations, because what makes this study valuable is also a limitation, in the sense that the population studied on Reddit is not representative of the general population. According to the most recent statistics, approximately 36% of US American Reddit users are aged 18-29, approximately 22% are between 30-49 years old, and only 10% are between 50-64 years old, implying that the majority of Reddit users are younger in age (Marketing Charts, 2021). To summarise, Reddit appears to be particularly suited to investigating the climate emotions of younger populations; however, future qualitative research should broaden its scope beyond younger adults in likely industrialised countries to include all age groups and less developed countries. Another potential limitation related to the online context is that most qualitative studies to date have only examined CA experiences discussed in the English language (Pihkala, 2022). Future research could examine a variety of languages to ensure that individuals globally can authentically report their climate emotions in their native language. This can be beneficial in terms of representativeness, allowing participants to provide reports in their own language ensures that individuals from diverse cultural and linguistic backgrounds are represented in the research field. Further, Participants may be able to express themselves more accurately and meaningfully in their own language, leading to more trustworthy results. Moreover, by allowing participants to provide reports in their own language, researchers can increase accessibility for individuals who may not be fluent in the language used by the researcher. Finally, this consideration shows respect for the participants' cultural and linguistic backgrounds and can help to create a more inclusive research environment. This may improve the accuracy and comprehensiveness of scientific literature on climate emotions.

Furthermore, the researcher needs to take into consideration that social media is a self-presentational space where people often try to present themselves in a certain way, which means that the language used on social media may not necessarily reflect the participant's true emotions or motivations, making it important to exercise caution when interpreting the data collected from social media (Hollenbaugh, 2021).

To conclude, this thesis added to the existing literature, by confirming previous findings of negative climate emotions, thus strengthening them. Feelings of distrust and betrayal as discussed in the theme “Distrust directed at powerful outgroups”, were also found by scholars such as Hickman et al. (2021) and Jones and Davison (2021). Furthermore, the emotions of guilt and shame described in the theme “Guilt and shame parents take the blame” resonates with the work of Hickman et al. (2021), Hiser and Lynch (2021), Hyry (2019) and Smith and Leiserowitz (2014). Moreover, Frustration is also a commonly discussed climate emotion and is embodied in the studies such as the ones by Andrews & Hoggett (2019), Marczak et al., Verlie (2019) as well as Verlie et al. (2020). Additionally, emotions such as despair, hopelessness, and powerlessness, were voiced in the theme “Despair is the most evident solution” among others, have already been explored by academics such as Hickman et al. (2021), Hiser and Lynch (2021), Hyry (2019) and Smith and Leiserowitz (2014). Whereas findings on positive climate emotions can be considered novel due to the primary focus on negative climate emotions in previous literature. Therefore, this study draws attention to the presence of positive climate emotions, such as pride and hope, which are less commonly discussed. This adds to understanding the complex and multifaceted nature of CC emotions and contributes to the literature surrounding climate emotion research. Lastly, RTA sheds light on the experiences and emotions of individuals concerned about CC by allowing a better understanding of the collective emotions and attitudes towards the issue through the lens of online environments. This can aid in understanding how climate emotions influence actions to

mitigate CC and inform strategies to reduce negative climate emotions and harness positive climate emotions to enhance collective action in the future.

References

- Aaltola, E. (2021). Defensive over climate change? Climate shame as a method of moral cultivation. *J. Agric. Environ. Ethics* 34, 1–23.
- Amaya, A., Bach, R., Keusch, F., and Kreuter F. (2019). New data sources in social science research: Things to know before working with Reddit data. *Social Science Computer Review*.
- American Psychological Association (2020). Majority of US adults believe climate change is most important issue today. (2020, February 6) Retrieved 25/9/22 <https://www.apa.org/news/press/releases/2020/02/climate-change>.
- Anatolievna, O., & Valerievna, M. (2022). The role of the media in escalating social tension in the USA. In *SHS Web of Conferences* (Vol. 134, p. 00171)
- Anderson, A. A., & Becker, A. B. (2018). Not just funny after all: Sarcasm as a catalyst for public engagement with climate change. *Science Communication*, 40(4), 524–540.
- Andrews, N., and Hoggett, P. (2019). “Facing up to ecological crisis: a psychosocial perspective from climate psychology,” in *Facing Up to Climate Reality: Honesty, Disaster and Hope*, ed J. Foster (London: Green House Publishing), 155–171.
- Antadze, N. (2020). Moral outrage as the emotional response to climate injustice. *Environ. Justice* 13, 21–26.
- Baden, D. (2019). Solution-focused stories are more effective than catastrophic stories in motivating proenvironmental intentions. *Ecopsychology*, 11(4), 254–263.

- Barnwell, G., Stroud, L., & Watson, M. (2020). Critical reflections from South Africa: Using the Power Threat Meaning Framework to place climate-related distress in its socio-political context. In *Clin. Psychol. Forum* (Vol. 332, pp. 7-15).
- Bartlett, S. (2008). Climate change and urban children: Impacts and implications for adaptation in low- and middle-income countries. *Environment and Urbanization*, 20, 501–519.
- Bechtoldt, M. N., Götmann, A., Moslener, U., & Pauw, W. P. (2021). Addressing the climate change adaptation puzzle: A psychological science perspective. *Climate Policy*, 21(2), 186-202.
- Behrens, S. (2022). *What Are the Feelings Prompted by Manifestations of Climate Change Among the Young Generations? A Survey Among University Students in Fryslân* (Doctoral dissertation).
- Berry, Helen, Thomas D. Waite, Keith B. G. Dear, Anthony G. Capon, & Virginia Murray. 2018. "The Case for Systems Thinking about Climate Change and Mental Health." *Nature Climate Change* 8 (4): 282–290.
- Bhagwat, S. A., Economou, A., & Thornton, T. F. (2016). The idea of climate change as a belief system: Why climate activism resembles a religious movement. *GAIA - Ecological Perspectives for Science and Society*, 25(2), 94–98.
- Bjornberg, K. E., Karlsson, M., Gilek, M., & Hansson, S. O. (2017). Climate and environmental science denial: A review of the scientific literature published in 1990-2015. *Journal of Cleaner Production*, 167, 229–241.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.

Brulle, R. (2018), 30 years ago global warming became front-page news— And both republicans and democrats took it seriously. Parkville, VIC, Australia: The Conversation Media Group. Retrieved from <http://theconversation.com/30-years-ago-global-warming-became-front-page-news-and-both-republicans-and-democrats-took-it-seriously-97658>.

Carver, C. S., & Scheier, M. F. (2014). Dispositional optimism. *Trends in cognitive sciences*, 18(6), 293-299.

Change, A. D. C., Blair, T., Pachauri, R. K., & Pachauri, R. (2006). *Avoiding dangerous climate change*. Cambridge University Press.

Choi, D., Han, J., Chung, T., Ahn, Y. Y., Chun, B. G., & Kwon, T. T. (2015). Characterizing conversation patterns in reddit: From the perspectives of content properties and user participation behaviors. In Proceedings of the 2015 ACM on Conference on Online Social Networks, 233-243.

Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of anxiety disorders*, 74, 102263.

Clayton, S., Manning, C. M., & Krygsman, K. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*. Washington, D.C: American Psychological Association, and ecoAmerica.

Clayton, S., & Karazsia, B. (2020). Development and validation of a measure of climate change anxiety. *Journal of Environmental Psychology*, 69.

Conversano, C., Rotondo, A., Lensi, E., Della Vista, O., Arpone, F., & Reda, M. A. (2010).

Optimism and its impact on mental and physical well-being. *Clinical practice and epidemiology in mental health: CP & EMH*, 6, 25.

Cook, J., Ellerton, P., & Kinkead, D. (2018). Deconstructing climate misinformation to identify reasoning errors. *Environmental Research Letters*, 2018, 024018.

Corbin, J.; Strauss, A. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*; Sage Publications: Southend Oaks, CA, USA, 2014.

Corr, P. J. (2011). Anxiety: Splitting the phenomenological atom. *Personality and Individual Differences*, 50(7), 889–897

Cunsolo, A. W., Harper, S. L., Edge, V. L., Landman, K., Houle, K., & Ford, J. D. (2013).

The land enriches the soul: On climatic and environmental change, affect, and emotional health and well-being in Rigolet, Nunatsiavut, Canada. *Emotion, Space and Society*, 6, 14–24.

Ding, D., Maibach, E. W., Zhao, X., Roser-Renouf, C., & Leiserowitz, A. (2011). Support for climate policy and societal action are linked to perceptions about scientific agreement. *Nature Climate Change*, 1(9), 462–466.

Doherty, Thomas J. 2015. "Mental Health Impacts." In *Climate Change and Public Health*, ed. by Barry Levy & Jonathan Patz, 195–214. Oxford & New York: Oxford University Press.

Ellis, N., & Albrecht, G. (2017). Climate change threats to family farmers' sense of place and mental wellbeing: A case study from the Western Australian Wheatbelt. *Social Science & Medicine*, 175, 161–168.

- Ekholm, S.; Olofsson, A. Parenthood and worrying about climate change: The limitations of previous approaches. *Risk Anal.* **2017**, *37*, 305–314.
- Farrell, J. (2019). The growth of climate change misinformation in US philanthropy: evidence from natural language processing. *Environmental Research Letters*, *14*(3), 034013.
- Fredrickson, B. L. (2004). The broaden–and–build theory of positive emotions. *Philosophical transactions of the royal society of London. Series B: Biological Sciences*, *359*(1449), 1367-1377.
- Fusch, P. I., & Ness, L. R. (2015). Are we there yet? Data saturation in qualitative research. *The qualitative Report*, *20*(9), 1408.
- Global Warming Policy Forum. (2014). Who we are. Retrieved from <http://www.thegwpf.org/who-we-are>
- Greenspan, Miriam. 2004. *Healing Through the Dark Emotions: The Wisdom of Grief, Fear, and Despair*. Boulder: Shambhala.
- Hameed, Z., Khan, I. U., Islam, T., Sheikh, Z., & Khan, S. U. (2019). Corporate social responsibility and employee pro-environmental behaviors: The role of perceived organizational support and organizational pride. *South Asian Journal of Business Studies*.
- Harvey, J. A., van den Berg, D., Eilers, J., Kampen, R., Crowther, T. W., Roessingh, P., Verheggen, B., Nuijten, R. J. M., Post, E., Lewandowsky, S., Stirling, I., Balgopal, M., Amstrup, S. C., & Mann, M. E. (2017). Internet Blogs, Polar Bears, and Climate-Change Denial by Proxy. *BioScience*, *68*(4), 281–287.

- Hayes, K., Blashki, G., Wiseman, J., Burke, S., & Reifels, L. (2018). Climate change and mental health: Risks, impacts and priority actions. *International journal of mental health systems, 12*(1), 1-12.
- Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., ... & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *The Lancet Planetary Health, 5*(12), e863-e873.
- Hidalgo, C. R., Tan, E. S. H., & Verlegh, P. W. (2015). The social sharing of emotion (SSE) in online social networks: A case study in Live Journal. *Computers in Human Behavior, 52*, 364-372.
- Hiser, K., and Lynch, M. (2021). Worry and hope: what college students know, think, feel, and do about climate change. *J. Commun. Engagement Scholarship 13*:7.
- Hollenbaugh, E. E. (2021). Self-presentation in social media: Review and research opportunities. *Review of communication research, 9*, 80-98.
- Hyry, J. (2019). *Kansalaiskysely ilmastonmuutoksesta ja tunteista [National Survey on Climate Change and Emotions]*. Helsinki: Sitra; the Finnish Innovation Fund.
Available online at: <https://media.sitra.fi/2019/11/29131052/sitraclimate-emotions-report-2019.pdf>
- Iniguez-Gallardo, V., Lenti Boero, D., & Tzanopoulos, J. (2021). Climate change and emotions: analysis of people's emotional states in southern Ecuador. *Frontiers in Psychology, 12*, 644240.

Jackson ST (2021) Climate change. Encycl Br <https://www.britannica.com/science/climate-change>

Jones, C. A., & Davison, A. (2021). Disempowering emotions: The role of educational experiences in social responses to climate change. *Geoforum*, 118, 190-200.

Kahn-Harris, K. (2021, August 25). *Denialism: what drives people to reject the truth*. The Guardian. Retrieved September 11, 2022.

King N. 2004. Using templates in the thematic analysis of text. In Cassell C, Symon G, editors. Essential guide to qualitative methods in organizational research. London (UK): Sage; p. 257–270.

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical teacher*, 42(8), 846-854.

Kilgo, D. K., Ng, Y. M. M., Riedl, M. J., & Lacasa-Mas, I. (2018). Reddit's veil of anonymity: Predictors of engagement and participation in media environments with hostile reputations. *Social Media + Society*, 4, 1-9.

Knupfer, H., Neureiter, A., & Matthes, J. (2023). From social media diet to public riot? Engagement with “greenfluencers” and young social media users' environmental activism. *Computers in Human Behavior*, 139, 107527.

Kretz, L. (2017). “Emotional solidarity: ecological emotional outlaws mourning environmental loss and empowering positive change,” in *Mourning Nature: Hope at the Heart of Ecological Loss & Grief*, eds A. Cunsolo Willox and K. Landman (Montreal, QC; Kingston, ON: McGill-Queen's University Press), 258–291.

- Kubler-Ross, E., & Kessler, D. (2005). *On grief and grieving: Finding the meaning of grief through the five stages of loss*. Simon and Schuster.
- Landmann, H., and Rohmann, A. (2020). Being moved by protest: collective efficacy beliefs and injustice appraisals enhance collective action intentions for forest protection via positive and negative emotions. *J. Environ. Psychol.*
- Lertzman, R. (2019). New methods for investigating new dangers. In *Climate Psychology* (pp. 25-39). Palgrave Macmillan, Cham.
- Lewandowsky, S., Cook, J., Oberauer, K., & Marriott, M. (2013). Recursive Fury: Conspiracist Ideation in the Blogosphere in Response to Research on Conspiracist Ideation. *Frontiers in Psychology, 4*.
- Lewandowsky, S., Ecker, U. K., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and its correction: Continued influence and successful debiasing. *Psychological science in the public interest, 13*(3), 106-131.
- Lewis, M. (2016). "The emergence of human emotions," in *Handbook of Emotions, 4th Edn.*, eds L. F. Barrett, M. Lewis, and J. Haviland-Jones (New York, NY: Guilford Press), 272–292.
- Lin, Y. (2022, November 3). *10 reddit statistics you should know in 2023 [infographic]*. Oberlo. Retrieved January 9, 2023, from <https://www.oberlo.com/blog/reddit-statistics>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. sage.
- Maher, L., & Dertadian, G. (2018). Qualitative research. *Addiction, 113*(1), 167–172.

- Marczak, M., Winkowska, M., Chaton-Østlie, K., & Klöckner, C. (2021). It's like getting a diagnosis of terminal cancer: an exploratory study of the emotional landscape of climate change concern in Norway.
- Mavrodieva, A. V., Rachman, O. K., Harahap, V. B., & Shaw, R. (2019). Role of social media as a soft power tool in raising public awareness and engagement in addressing climate change. *Climate*, 7(10), 122.
- McKinnon, C. (2014). Climate change: Against despair. *Ethics & the Environment*, 19(1), 31-48.
- Minol, K., Spelsberg, G., Schulte, E., & Morris, N. (2007). Portals, blogs and co.: the role of the Internet as a medium of science communication. *Biotechnology Journal*, 2(9), 1129–1140
- Morganstein, J. C., & Ursano, R. J. (2020). Ecological disasters and mental health: Causes, consequences, and interventions. *Frontiers in Psychiatry*, 11, 1.
- Moser, S. C., & Dilling, L. (Eds.). (2007). *Creating a climate for change: Communicating climate change and facilitating social change*. Cambridge University Press.
- Mosquera, J., & Jylhä, K. M. (2022). How to Feel About Climate Change? An Analysis of the Normativity of Climate Emotions. *International Journal of Philosophical Studies*, 30(3), 357-380.
- Naslund, J. A., Aschbrenner, K. A., Marsch, L. A., & Bartels, S. J. (2016). The future of mental health care: peer-to-peer support and social media. *Epidemiology and psychiatric sciences*, 25(2), 113-122.

- Nyantakyi-Frimpong, H., & Bezner-Kerr, R. (2015). The relative importance of climate change in the context of multiple stressors in semi-arid Ghana. *Global Environmental Change*, 32, 40-56.
- Ojala, M. (2017). Hope and anticipation in education for a sustainable future. *Futures*, 94, 76-84.
- Oreskes N, Conway E. 2011. Merchants of Doubt. Bloomsbury Press.
- Pearce, W., Niederer, S., Özkula, S. M., & Sánchez Querubín, N. (2019). The social media life of climate change: Platforms, publics, and future imaginaries. *Wiley interdisciplinary reviews: Climate change*, 10(2), e569.
- Pihkala, P. 2019. Climate anxiety.
- Pihkala, P. 2018. "Eco-anxiety, tragedy, and hope: psychological and spiritual dimensions of climate change", *Zygon* 53 (2), 545–569.
- Pihkala, P. (2022). Toward a taxonomy of climate emotions. *Frontiers in climate*, 199.
- Rafaty, R. (2018). Perceptions of corruption, political distrust, and the weakening of climate policy. *Global Environmental Politics*, 18(3), 106-129.
- Rees, J. H., Klug, S., & Bamberg, S. (2015). Guilty conscience: motivating pro-environmental behavior by inducing negative moral emotions. *Climatic change*, 130, 439-452.
- Relman, E., & Hickey, W. (2019, March). More than a third of millennials share Rep. Alexandria Ocasio-Cortez's worry about having kids while the threat of climate change looms. Business Insider. <https://www.businessinsider.com/millennials-americans-worry-about-kids-children-climate-change-poll-2019-3>.

- Running, Steven W. 2007. "The 5 Stages of Climate Grief", Numerical Terradynamic Simulation Group Publications, 173. (http://scholarworks.umt.edu/ntsg_pubs/173)
- Saraiva, A., Fernandes, E., & von Schwedler, M. (2021). The pro-environmental consumer discourse: A political perspective on organic food consumption. *International Journal of Consumer Studies*, 45(2), 188-204.
- Scales, D., Gorman, J., Leff, C., & Gorman, S. (2021). Effective ways to combat online medical and scientific misinformation: A hermeneutic narrative review and analysis.
- Schneider, C. R., Zaval, L., & Markowitz, E. M. (2021). Positive emotions and climate change. *Current Opinion in Behavioral Sciences*, 42, 114-120.
- Schmuck, D., Hirsch, M., Stevic, A., & Matthes, J. (2022). Politics—Simply Explained? How Influencers Affect Youth's Perceived Simplification of Politics, Political Cynicism, and Political Interest. *The International Journal of Press/Politics*, 27(3), 738-762.
- Shin, J., Jian, L., Driscoll, K., & Bar, F. (2017). Political rumoring on Twitter during the 2012 US Presidential Election: Rumor Diffusion and Correction. *New Media & Society*, 19, 8(2017), 1214–1235.
- Smith, N., and Leiserowitz, A. (2014). The role of emotion in global warming policy support and opposition. *Risk Anal.* 34, 937–948.
- Soutar, C., & Wand, A. P. (2022). Understanding the Spectrum of Anxiety Responses to Climate Change: A Systematic Review of the Qualitative Literature. *International Journal of Environmental Research and Public Health*, 19(2), 990.

Stevens-Rumann, C. S., Kemp, K. B., Higuera, P. E., Harvey, B. J., Rother, M. T., Donato, D.

C., ... & Veblen, T. T. (2018). Evidence for declining forest resilience to wildfires under climate change. *Ecology letters*, 21(2), 243-252.

Stoknes, P. E. (2015). *What We Think About When We Try Not to Think About Global Warming: Toward a New Psychology of Climate Action*. White River Junction: Chelsea Green Publishing.

Spector, P. E. (1982). Behavior in organizations as a function of employee's locus of control. *Psychological bulletin*, 91(3), 482.

Suran, M., & Kilgo, D. K. (2017). Freedom from the press? How anonymous gatekeepers on Reddit covered the Boston Marathon bombing. *Journalism Studies*, 18, 1035-1051.

Taylor, M.; Murray, J. 'Overwhelming and Terrifying': The Rise of Climate Anxiety.

Available online:

<https://www.theguardian.com/environment/2020/feb/10/overwhelming-and-terrifying-impact-of-climate-crisis-on-mental-health> (accessed on 11th September 2022).

Terry, G., Hayfield, N., Clarke, V., & Braun, V. (2017). Thematic analysis. *The SAGE handbook of qualitative research in psychology*, 2, 17-37.

The Intergovernmental Panel on Climate Change (2022) Climate change 2022: impacts, adaptation, and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press (in press)

The Lancet planetary health homepage. The Lancet Planetary Health. (n.d.). Retrieved September 20, 2022, from <https://www.thelancet.com/journals/lanplh/home>

Treen, K. M. D., Williams, H. T. P., & O'Neill, S. J. (2020). Online misinformation about climate change. *WIREs Climate Change*, 11(5).

Toivonen, H. (2022). Themes of climate change agency: a qualitative study on how people construct agency in relation to climate change. *Humanities and Social Sciences Communications*, 9(1), 1-11.

Tollemache R (2019) We have to talk about... climate change. In: Hoggett P (ed.) *Climate psychology: on indifference to disaster*. Palgrave Macmillan, Cham, pp. 217–237

Uzzell, D., & Rätzsch, N. (2009). Transforming environmental psychology. *Journal of Environmental Psychology*, 29(3), 340-350.

Van der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the public against misinformation about climate change. *Global Challenges*, 1, 1600008.

Varpio L, Young M, Uijtdehaage S, Paradis E. 2019. Articulating the distinctions between theory, theoretical framework, and conceptual framework. *Acad Med*. Published Ahead of Print.

Verlie, B. (2019). Bearing worlds: learning to live-with climate change. *Environ. Educ. Res.* 25, 751–766.

Verlie, B., Clark, E., Jarrett, T., and Supriyono, E. (2020). Educators' experiences and strategies for responding to ecological distress. *Austral. J. Environ. Educ.* 37, 132–146.

- Verplanken B, Marks E, Dobromir AI. On the nature of eco-anxiety: how constructive or unconstructive is habitual worry about global warming? *J Environ Psychol* 2020; **72**: 101528.
- Vicario, M. D., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G., ... Quattrociocch, W. (2016). The spreading of misinformation online. *Proceedings of the National Academy of Sciences of the United States of America*, 113(3), 554–559.
- von Mossner, A. W. (2018). From Nostalgic Longing to Solastalgic Distress. *Affective Ecocriticism: Emotion, Embodiment, Environment*, 51.
- Washington, H. (2013). *Climate change denial: Heads in the sand*. Routledge.
- Wasserman E. (2018). In video interview: Dictionary.com's 2018 word of the year is Retrieved from <https://www.dictionary.com/e/word-of-the-year/>
- Wang, S., Leviston, Z., Hurlstone, M., Lawrence, C., & Walker, I. (2018). Emotions predict policy support: Why it matters how people feel about climate change. *Global Environmental Change Part A*, 50, 25–40.
- Wang, X., Van der Werff, E., Bouman, T., Harder, M. K., & Steg, L. (2021). I am vs. we are: how biospheric values and environmental identity of individuals and groups can influence pro-environmental behaviour. *Frontiers in Psychology*, 12, 618956.
- Ward, M. Climate Anxiety Is Real, and Young People Are Feeling It. Available online: <https://www.smh.com.au/lifestyle/health-and-wellness/climate-anxiety-is-real-and-young-people-are-feeling-it-20190918-p52soj>.

Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Belesova, K., Boykoff, M., ... &

Montgomery, H. (2019). The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. *The Lancet*, 394(10211), 1836-1878.

Weintrobe, S. (2021). *Psychological roots of the climate crisis: neoliberal exceptionalism and the culture of uncare*. Bloomsbury Publishing USA.

White, Benjamin. 2015. "States of Emergency: Trauma and Climate Change." *Ecopsychology* 7 (4): 192– 197.

Whitmarsh, L., Player, L., Jiongco, A., James, M., Williams, M., Marks, E., & Kennedy-Williams, P. (2022). Climate anxiety: What predicts it and how is it related to climate action?. *Journal of Environmental Psychology*, 83, 101866.

Williams, L. A., & DeSteno, D. (2008). Pride and perseverance: The motivational role of pride. *Journal of Personality and Social Psychology*, 94(6), 1007–1017.

Williams, H. T., McMurray, J. R., Kurz, T., & Lambert, F. H. (2015). Network analysis reveals open forums and echo chambers in social media discussions of climate change. *Global environmental change*, 32, 126-138.

Willox, A.C.; Harper, S.L.; Edge, V.L.; Landman, K.; Houle, K.; Ford, J.D. The Rigolet Inuit Community Government ‘The land enriches the soul’: On climatic and environmental change, affect, and emotional health and well-being in Rigolet, Nunatsiavut, Canada. *Emot. Space Soc.* **2013**, 6, 14–24.

Wong-Parodi, G., Krishnamurti, T., Davis, A., Schwartz, D., & Fischhoff, B. (2016). A decision science approach for integrating social science in climate and energy solutions. *Nature Climate Change*, 6(6), 563-569.

Woodbury, Chiva. 2019. "Climate Trauma: Towards a New Taxonomy of Trauma." *Ecopsychology* 11 (1).

Wullenkord, M. C., Tröger, J., Hamann, K. R., Loy, L. S., & Reese, G. (2021). Anxiety and climate change: A validation of the Climate Anxiety Scale in a German-speaking quota sample and an investigation of psychological correlates. *Climatic Change*, 168(3), 1-23.