Place, risk perception, and experiences of climate anxiety in rural and urban areas in the Netherlands and France

Master thesis

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Preface

This research was executed for the completion of the master thesis for the MSc. Cultural Geography - Climate Adaptation Governance at the University of Groningen.

I would like to sincerely thank my supervisor, Hamed Seddighi, for his guidance and his kindness throughout the process of writing this thesis. You provided me with valuable feedback and discussions that always challenged me but never failed to inspire me and give me new ideas. The participants in this study also have my immense gratitude, your willingness to share your thoughts and feelings with me and your availability were what made this study possible. To my friends and family, you have my gratitude for your unwavering support. Your encouragement at all times, especially when I faced difficulties, have kept me going throughout this process. Finally, I would like to thank Erika for giving me the best deadline one could wish to work towards.

Contents

Abstract

This research aimed to ameliorate the understanding of French and Dutch rural and urban residents' experiences of climate anxiety looking at their place attachment and risk awareness and perception. To achieve this, a qualitative study was performed. Semi-structured in-depth interviews were held with 15 participants, individuals from rural and urban areas in the Pays-de-la-Loire region and Groningen, Friesland, and Flevoland. Participants were of all ages and had different levels of affinity with climate change. The results show that all known elements of climate anxiety are present to some degree. Furthermore, risk awareness did not necessarily lead to feeling at risk and worrying about one's own home. Place attachment was found here to be a source of that optimistic bias. Especially rural participants experienced this, the rural landscape being experienced as unchanging. Climate change was also found to be experienced at different scales. Rather than the local level, worries and anxiety were also concerned with climate change at the national, European, and global levels. Finally, ways in which participants coped with their anxiety were identified, as were reasons for non-engagement in pro-environmental behaviors. The study concluded that place attachment, risk perception, and climate anxiety influence each other, but is unable to draw concrete and quantifiable links. This could be addressed in further research .

Keywords: Sense of place, place attachment, risk perception, climate anxiety, pro-environmental behavior.

1. Introduction and research aim

1.1 Background and introduction

Climate change as we experience it now is a wicked problem of an enormous scale (IPCC, 2022). The impacts are felt all around the planet. Every ecosystem on every continent has suffered the negative impacts to some extent (IPCC, 2022). Climate change exacerbates hazards, both slow and fast onset, such as droughts, floods, erosion, or wildfires. These hazards can negatively impact people and their development, causing issues such as poverty, food insecurity, health and mental health issues, and loss of life (IPCC, 2022; Wisner et al., 2004). Mitigation of climate change is crucial to avoid future worsening of its impacts. Furthermore, adaptation action is needed to reduce the risk associated with climate change.

Engagement in both is primordial. Therefore, it is important to understand the reactions to climate change and what mechanisms underpin them. One of such reactions is climate anxiety, which will be examined in this study.

Climate anxiety, or eco-anxiety, through the cognitive impairment that arises from it, has been found to increase, but also reduce, pro-environmental behaviors (Innocenti et al., 2023; Parreira & Mouro, 2023; Kurth & Pikhala, 2022). Stimulating pro-environmental behaviors is important to reduce the effects of climate change. This means it is especially important to understand the factors that motivate individuals to engage in pro-environmental behavior and to mitigate and adapt to climate change. In recent years the number of studies on this subject have been increasing, as it has gained popularity both in popular discourse and in academia. However, the manifestation of climate anxiety needs to be more researched among various populations of people, such as women, youth, and individuals living in areas more susceptible to climate change impacts (Hogg et al. 2021). This study tries to remedy this to some extent by actively seeking the participation of a diverse group of people.

Furthermore, this study will explore the concept of place in relation to climate anxiety. Understanding place attachment and responses to climate change in different contexts, urban and rural, is important because they have implications for the implementation of adaptation measures, as they must fit the social context of a place (Moser, 2013). Furthermore, place remains an interesting concept to study because it is relevant to understand the feelings and experiences of people who experience the consequences of climate change, and to understand how people perceive environmental risk (Scannell & Gifford, 2010; Fullilove, 1996). One of the ways through which the relation between place and eco-anxiety will be analyzed is through the concept of risk perception. Studies on the link between risk perception, place, and climate anxiety have yielded conflicting results (Parreira & Mouro, 2023; Bonaiuto et al., 2016; Stancu et al., 2020; Armas, 2006). As such, it is interesting to explore how people experience climate anxiety and risk in different places.

This study aims to look at the role of place and risk in people's experiences of climate change and climate anxiety. It tries to achieve this through a qualitative research design, using semi-structured in-depth interviews to uncover people's experiences in rural and urban areas in the Netherlands and France. First, the study objectives and research questions are laid out, then the theoretical framework is discussed. In the next chapter the findings are presented. Then, the results are discussed. Finally, the thesis is concluded and limitations are presented.

1.2 Study objectives and research questions

The objective of this study is to look at individuals, diverse in their characteristics, and their experience of climate anxiety. It seeks to understand how the experience of climate change in a place that is important to them, which could be a place of residence, work, or other, informs these individuals' perception of risk and how that may shape feelings of climate anxiety. It seeks to understand whether living or feeling attachment to a certain place leads to certain levels of climate anxiety. To investigate this, the main question this thesis seeks to answer is 'What is the role of place attachment on risk perception and the experience of climate anxiety in rural and urban areas of the Netherlands and France?'. To answer this question, three sub-questions have been formulated, (1) 'How do rural and urban residents in the Netherlands and France experience climate change?', (2) 'How is sense of place related to individuals' risk perception?', (3) 'How is the experience of climate change related to sense of place?'.

2. Theoretical framework

2.1 Climate anxiety

Climate anxiety is a term that refers to anxiety that is experienced relating to the changing environment due to climate change. More specifically, it englobes climate change anxiety (Clayton, 2020; Clayton and Karazsia, 2020; Pihkala, 2020, Hickman, 2020) focused on fear concerning disasters and calamities resulting from it, and environmental anxiety, concerning harm to nature and the environmental in a larger sense, such as harm to ecosystems, pollution, deforestation, etc. These terms capture the negative feelings of worry, fear, stress, anxiety, distress, and guilt. Research suggests that climate anxiety may lead to functional, behavioral, and cognitive-emotional impairment, but also pro-environmental behavior (Clayton & Karazsia, 2020; Hickman, 2020). Furthermore, Hogg et al. (2021) provide evidence that climate anxiety englobes both the anxiety about environmental problems and the anxiety about one having a negative impact on the environment. For this study the term climate anxiety shall be used, as an all-encompassing term for these multiple feelings concerning climate and environmental change at large. Climate anxiety can be considered a rational response to the problem of climate change and does not necessarily only have negative consequences (Verplanken, 2013; Innocenti et al., 2023; Parreira & Mouro,

2023; Kurth & Pikhala, 2022). It has, for example, been linked to pro-environmental behavior. However, there is no consensus about this positive effect. For example, in one study it has been found that individuals living in coastal areas did not fear that their living area would be impacted. Because of that they denied the extent of risk and refused policies for adaptation and mitigation, despite their awareness of coastal erosion due to climate change (Goeldner-Gianella et al., 2015; Parreira & Mouro, 2023). This leads us to another concept, that of risk.

2.2 Risk perception

The IPCC defines risk as "the potential for adverse consequences for human or ecological systems, recognizing the diversity of values and objectives associated with such systems" (IPCC, 2020, p.4). In the context of climate change, this risk is a result of the interactions between climate induced hazards, exposure to those hazards, and the vulnerability of those systems that are exposed. These three factors are dynamic and subject to changes over space and time because of changes in the socio-economic fabric and the decisions that are made (IPCC, 2020). Risks may arise from both the actual impacts of the changing climate and the responses to counter climate change, which can mitigate the impacts of hazards, but the inverse can also be true in the case of maladaptation (IPCC, 2020). However, for responses to climate change to happen, people need a certain awareness of the existence of risk. Risk perception can be defined as "the intuitive judgement of individuals and groups of risks in the context of limited and uncertain information" (Raaijmakers et al., 2008, p.308). One factor that may inform risk perception is place attachment (Lemée et al., 2019), which will be discussed in the next sections.

2.3 Sense of place, place attachment

Place can be broadly defined as a 'meaningful location' (Lewicka, 2011a). Place attachment can be defined as "the bonding that occurs between individuals and their meaningful environments" (Scannell & Gifford, 2010, p.1). Emotional, social, symbolic connections and personal experiences can give individuals a sense of purpose and belonging to a place (Parreira & Mouro, 2023). Place attachment may vary due to factors such as the nature of a place (size, scale, characteristics, etc.) and people (length of residence in a place, social relations, social and economic status, age, etc.) (Scannell & Gifford, 2010; Lewicka, 2011a). The concept of place is and remains an important concept in a world subject to continuous changes, as place attachment retains a large importance in individuals' reactions to places and the changes that occur in places (Lewicka, 2011a; Giuliani, 2003).

Lewicka identified several dimensions of place attachment. One is 'traditional place attachment'. This can be defined as a sense of place that is inherited (2011a). This type of attachment is characterized by long-term residency in a set place, a connection to the neighborhood, identification through traditions rooted in the place, and resistance to moving away from that place (Lewicka, 2011b). Another of these dimensions is 'active place attachment'. This has a similar localization aspect to the former, long-term residence, but is characterized more so by active involvement in local initiatives and the community (Lewicka, 2011b; Parreira & Mouro, 2023). Place attachment may be formed from the very local scale of a place of residence or work to the large scale of e.g. the European Union. Other dimensions exist in the form of non-attachment, which is linked to high mobility and young age. For example, students in higher education who have moved away from their home to large cities or abroad report low to no place attachment (Lewicka, 2011b). The sense of place, or place attachment, has consequences for risk perception and eco-anxiety, which will be discussed in the next section.

2.4 Place attachment, risk awareness, and eco-anxiety

Active place attachment has been linked to increased risk perception, meaning that individuals who are actively involved in their place of residence are more aware of the potential threats to this place (Parreira & Mouro, 2023; Bonaiuto et al., 2016). The same link was not found by Parreira and Mouro (2023) for traditional place attachment, as opposed to Stancu et al. (2020). A reason for this could be that an increased involvement in local initiatives and risk awareness seem to be related, while traditional place attachment in people seems to go hand in hand with less social involvement (Bonaiuto, 2016; Lewicka, 2013). Furthermore, traditional place attachment could suffer from perceiving risk, as acting on risk might mean having to move away or to see the place changed, thus leading these individuals to possibly disregard information concerning risks or threats (Parreira & Mouro, 2023). Armas (2006) found a similar result, in that a strong connection with a place led to the disregard and denial of the risk a hazard might occur.

However, the different attachment styles are not necessarily to be separated, as they are both strongly linked to localism, despite cultural differences between the two (Lewicka, 2013), and because there is no one set definition of place attachment and sense of place that these studies use. Parreira and Mouro (2023) found place attachment overall to not significantly impact climate anxiety, however, risk perception was linked to higher climate anxiety. Furthermore, Stain et al. (2011) found place attachment, or a larger sense of place, to be linked to individual's worrying about drought and their perception of the impacts of drought. Conflicting findings come out of previous studies. As a result, it is interesting to look

further into these to find how risk perception, climate anxiety and sense of place might be connected.

3. Study area and methodology

3.1 Study area

The study area was the Netherlands and France. Conducting research with participants from various places in these two countries offers the possibility to explore experiences and cultural contexts, which can enrich the findings to achieve a better and more complete understanding of the experience of place, climate change and climate anxiety, and what cultural differences might exist.

In France, an interesting difference exists between the older and younger population. In fact, in a national survey concerning environmental practices, a majority of individuals (58%) aged 60 and over feel they are already doing all they can to protect the environment. In contrast, in the population aged 40 and under, almost 50% feel that they could do more for environmental protection. The same difference exists between rural and urban respondents, where rural participants felt like they were doing a lot to protect the environment more than urban respondents did (Insee, 2023). Furthermore, France does not have a large culture of risk, in the sense that the population at larger tends to not believe it is at great risk of immediate natural disasters (CGDD, 2011). In the context of climate change, it might be interesting to see how individuals experience this at their local scale and whether this is still an accurate description. Finally, France is less densely populated, has more rural areas than the Netherlands, and these places may also differ between the two countries in their characteristics. For example, the average French farm is different from the average Dutch farm. In this respect it is interesting to investigate whether these differences lead to different experiences of climate change and climate anxiety.

In the Netherlands, there is a long history of natural disasters, mostly of flooding due to the country's geography, and of human intervention to manage those disasters (Bakker et al., 2002). Inhabitants have long been aware of the risk they are exposed to. This makes it interesting to compare residents' experiences and feelings to French residents. Furthermore, the landscape context is different in the Netherlands. Urbanity is much more prevalent. In fact, the Netherlands are the "European champion for urban sprawl" (PBL, 2019). One could

say nature is present to a lesser extent, constituting cultural landscapes rather than natural landscapes. For these reasons the Netherlands is also an interesting ground for research.

3.2 Method

3.2.1 Research design

The design chosen to answer the research questions is a qualitative research design using interviews to collect data. Qualitative research is especially useful when there is not much knowledge yet on a topic. It is useful when a subject is still ill-defined or not well understood. It may also be useful when issues are deeply rooted within participants, such as responses to emotional or distressing events, which climate change might be considered. Finally, it is more useful than quantitative methods in cases where emotions, feelings, and motivations, especially on sensitive subjects, are under study (Ritchie, 2003). Interviewing as a method is ideal for accessing information on emotions, experiences, and opinions. It serves to inspect the complexities of motivations and behaviors. Furthermore, the interactive nature interviews allow for reflection and deeper inspection of experiences and emotions than a questionnaire could achieve. Finally, interviews are a good tool to investigate the variations and differences of meanings between individuals (Dunn, 2016), which is particularly useful for this study.

3.2.2 Selection of participants

The sampling method for this study was purposive and snowball sampling. This study aimed to look at individuals with certain characteristics, therefore, residents from both the Netherlands and France were selected from rural and urban areas. A total of 15 interviews were performed. Interviews were held with individuals who were more and less environmentally involved. In this way, the study aimed to find a variety of answers to gain an overview of people's reactions to climate change and their perceptions of risk. Beyond these criteria, participants were selected based on availability due to the short time frame for data collection. There were 13 female and two male participants. Most participants were 20 to 30 years old, with two being 50 to 60 years old and one being 60 to 70 years old. There was an approximately even split of urban and rural participants, and participants from the Netherlands and from France. A demographic table of the participants, including the country they reside in and whether they belong to an urban or rural area can be found in appendix A.

3.2.3 Instruments

Semi-structured in-depth interviews were performed. Interviews make it possible to unearth and map the different feelings, thoughts, opinions, attitudes, and perspectives of individuals (Braun & Clarke, 2016; Dunn, 2016). The interviews followed a relatively loose interview guide, which allowed for the participants to approach subjects they deemed important, to explore their thoughts and feelings, and to iteratively follow the path of their lived experiences without feeling restricted by the confines of a rigid guide. The guide served to indicate the important topics to cover during the interviews and to suggest questions to ask. Some interviews followed it more closely than others, depending on what the participants shared, and the order in which they approached topics. All topics of the guide were covered in each interview. The first part of the interview guide covered the topic of place attachment. Questions were based on the dimensions of place attachment identified by Lewicka (2011a). The second part of the interview guide covered the topic of risk perception. The third part of the interview guide concerned climate anxiety, participant's experiences of climate change. Questions were based on the Hogg Eco-Anxiety Scale (Hogg et al., 2021). The interview guide can be found in appendix B

Interviews took place in person, through Google Meets and through WhatsApp video call, depending on the preference and the location of the participant. Interviews were held in a language that was most comfortable for participants. In most cases this was participants' native language, Dutch and French, in three cases this was English, which was nonetheless a language the participants in question were very comfortable with. The interviews were audio recorded with the permission of the participants. The interviews lasted approximately between 25 and 55 minutes.

3.2.4 Data analysis

A thematic analysis of the interviews was performed using Atlas.ti. First, interviews were anonymized and transcribed in Word. The audio quality of the recordings did not allow for the use of transcription software. Therefore, transcriptions were manually performed, which allowed for exactitude of the transcripts. Analysis of the interviews started after the completion of all 15 interviews. First, I familiarized myself with their contents by reading through the transcriptions and identifying interesting quotes. Then, codes were inductively developed, whilst keeping in the back of the mind theory about climate anxiety, place, and risk. After all interviews were coded, overarching categories and themes were formed (Braun & Clarke, 2016; Dunn, 2016). Themes were then compared and further analyzed. Throughout the process of creating themes from codes and analyzing them, the associated quotes and

transcripts were continuously consulted to ensure that meanings were accurate accounts of participant's experiences and that meanings did not get lost.

3.2.5 Ethics

The ethics clearance form was filled, and ethics clearance was obtained on the basis of the survey. The nature of this study should not expose participants to any harmful situations or adverse effects. Despite that, to make sure participants can give proper informed consent, an information sheet was shared beforehand, and participants were given the opportunity to ask questions prior to the interview taking place. Participants were free to retract their participation at any point. Furthermore, the confidentiality of respondents was strictly dealt with. After each interview took place, the audio recordings were transcribed and anonymized. Each recording was deleted as soon as the transcription was completed. As a result, participants' personal information and identity cannot be linked to transcriptions and to results. The data gathered for this study will solely be used for this study. For this reason, after it is completed, all transcriptions will be deleted.

3.2.6 Positionality

As a Master student at the University of Groningen, this study exists as part of the curriculum. Beyond writing this thesis for the completion of the MSc. Cultural Geography – Climate Adaptation Governance, I have no interests, commercial or other. Furthermore, as a young person having grown up in the French countryside, I may not have the necessary knowledge to fully understand the perspectives of older participants or participants who have lived their lives in a significantly different context from mine. I recognize that this may be a limitation, as qualitative methods can never be fully objective. However, I strive to be open and to try understanding everyone's perspectives to enhance reflection during the interview and analysis stages.

4. Results

The results of this study yielded a number of themes and subthemes. The section concerning risk and place contains three themes, which are 'the rural landscape', 'risk is elsewhere', and 'a future problem'. For the section concerning climate anxiety, there are five themes: 'affective symptoms', 'behavioral symptoms', 'ruminative eco-anxious thoughts',

'anxiety about own contribution', and 'coping with anxiety'. Finally, for the section of justification for non-engagement in pro-environmental behavior, there are three themes: 'governments', ' industries', and 'other individuals'. Themes may contain sub-themes where distinctions are necessary and to detail the results. Tables at the start of each section clarify the themes and subthemes that will be discussed in that section.

4.1 Risk and place

Theme	Sub-theme
The rural landscape	A perennial landscape
	Change as a permanent state
	Refusal to accept predictions
Climate change is elsewhere	Risk not present 'here'
	Climate change through the media
	Different scales
A future problem	Future generations bear the burden
	Real impacts far away

4.1.1   The rural landscape

A recurring theme for participants from rural areas was the conception of the rural environment as being an enduring, unchangeable entity in a world that is constantly changing around it.

4.1.1.1   A perennial landscape

The countryside was experienced by several participants who had their homes in a rural area as a place that is calm and peaceful, that will remain the same even when the world is changing at a rapid pace. The countryside might mentally be an exception to what is observable in the world and outside of the countryside bubble. It provides a sense of familiarity and a feeling of belonging that participants were attached to.

- "I like the fact that even though it's developing, it's still more or less the same thing. It's a kind of cocoon where you know that, even if there are new things, people arriving, people leaving, it's still more or less the same thing. If I ride my bike like I used to, I'm going to see the same thing. And in a world that's changing a lot, where nothing's the same and everything's changing all the time, it's nice to find points of reference and things that don't change. [...] it reinforces the feeling that we're good, I will always remain the child of my parents, my grandparents, the niece of my aunts and uncles (7)"

The countryside was, in this respect, opposed to cities which were symbolic of dynamism, change, and pollution.

- "When you go to Nantes (large city), it's a day full of smells, sounds, people and noise, and when you come back to Mouais, or even Derval or Sion (villages), it's quiet, not very dynamic, and that's what we like here. When you go to Mouais in front of the church, there's no one there, you're alone in the town, even though it's supposed to be a lively place [...] it's a bit of a country bubble in the middle of big cities, for me nothing can happen there (11)"
- "I prefer the calm and serenity of the countryside, and I know that when I grow up I'd like to live in the country rather than in the city. I don't like the city because of all the pollution, noise, and incivility, especially in Nantes. Everything you don't find in the countryside (9)".

When probing one participant about this feeling of permanence of the countryside with the effects of climate change and environmental changes that are noticeable in that area of France, most notably the yellow, dry, dead grass and trees in summer that accompany the heatwaves and increasing temperatures, and the increase in precipitation (in her own words "torrential rain" (7)) and risk of floods in the other seasons, the landscape remained a relatively immutable idea to her.

4.1.1.2   Change as a permanent state

A number of rural participants had difficulty remembering when changes of weather and climate started happening. The slow, gradual onset changes contribute to this as there is no hard demarcation of a before and after. This contributed to a feeling that, though consciously there is a difference because of climate change, it is hard to remember how it used to be in the past. As a consequence, some effects of climate change attain an aspect of normalcy, as if they have been around for a long time. The 'changed' becomes a sort of permanent state. Two French participants mentioned the increasing heat and heatwaves as an example, stating they knew that the situation has changed compared to the past, but had difficulty pointing out when this change started and how it is different.

- "I know that when it comes to heatwaves, there's bound to be a difference, but at the same time I have trouble remembering summers without heatwaves. […] I find it hard to remember as a child if there were summers when there were no heatwaves. Adults in France often tell us, or the media, about the 2003 heatwave, but for me it doesn't mean a thing. I was 3 and I don't remember it. So I don't know if there weren't any in the summers after that. Do you remember the last summer without a heatwave? (11)"
- "I have trouble remembering when it started (8)".

A Dutch rural participant reported a similar feeling, finding it difficult to see what exactly had changed, because of the slow-onset nature of climate events.

- "Yes and, I think a lot of things have changed, but changes that go slowly also wear in slowly. So I don't really know either. (12)"

4.1.1.3   Refusal to accept predictions

Attachment to a place might create resistance to perceiving a risk in that place. One rural participant expressed the feeling that a risk that she was consciously aware of could not imaginably actually occur in the place where she lived and that she felt attached to.

- "Strangely enough, I find it hard to imagine everything that the large organizations predict where I live. It seems unimaginable to me that, maybe I'm exaggerating a bit, but there will be a big tornado coming through our area. For me it's unimaginable, so I can't imagine it. […] I don't believe it, I find it hard to believe

the changes that will happen in my home. Even though I know it's going to have an effect. (11)"

This seems related to the idea of the countryside as a bubble of peace that is characterized by familiarity. A place that has remained similar in terms of landscape, inhabitants, and activities since before one was born seems to be difficult to imagine changed. It would be interesting to question long-term urban residents how they experience this. When asked about specific risks that exist in the area, the same participant was aware of the actual risk of flooding, but described similarly that she could not imagine it actually happening and preferred not to look at such predictions.

- "Now, if you look at the maps showing how they expect France to be flooded in 100 years' time, we'll be wiped off the map. Right now, I can't imagine my house under water. [...] But I try not to look too much. I don't know if it's good or bad, but I try not to look too much at what's going to happen in 100 years' time because it's all negative. (11)"

4.1.2 Risk is elsewhere

Another recurring theme was a bias in participants' experiences of climate change, experiencing it as taking place somewhere else.

4.1.2.1   Risk is not present 'here'

A number of participants experienced hazards related to climate change as being nearly inconceivable in their place of residence. This is despite being aware of changes and potential hazards. Hazards are seen as happening in other places and to other people, and the idea of them taking place in their area is unacceptable. One urban participant expressed:

- "You actually almost don't think about that because you think that doesn't happen here (6)"

A rural participant expressed a similar thought:

- "Right now it's happening to others and not to me, and it will happen to others and not to me. (11)"

Some participants residing in the Netherlands expressed that climate change was, of course, taking place there, but that risk was rather present in other countries where socio-economic determinants increase the vulnerability of inhabitants. Thus, they worried for

people living in those areas, and not much for their own situation which was deemed safe from the effects of climate change.

- I feel like I am quite privileged living in the Netherlands and that I can take care of myself. The problem is the people who are not privileged and who don't have the resources to deal with the hot weather. Like older people don't have the health to survive the long walking in the hot weather or in poorer countries, if the weather changes there will be a lot more deaths because they are not equipped to deal with it, so that is where the real problem is. (5)"

4.1.2.2   Climate change through media

A common experience among the participants was that climate change was not only seen and lived in and around their homes, but also experienced beyond their own borders through a number of channels. Commonly named platforms through which they gain information and learn of the consequences of climate change were the news, the internet, the television, and social media (including Facebook, YouTube, Instagram). One Dutch participant, who did not necessarily experience the effects of climate change in her daily life, experiences worry when reading news about climate change.

- "More when I watch the news and see like oh my god it's getting worse again or something. Then I do get really worried. And if I live my daily life, for example if I just go to work, then I'm not really confronted with it then I don't really think about it, no. I do check the NOS app every day. It doesn't always say something about climate change, but once a week it does. And then I think about it. (4)"

A French participant said she experiences anxious feelings when faced with worldwide examples of climate change on television.

- "But when you hear about it on TV, all the disasters and everything that's happening in the world, it's bound to make you a little anxious. (8)"

Separate from official news channels, social media platforms allow the sharing of all kinds of content concerning climate change. In an era of constant access to near unlimited information, one French participant shared that an omnipresence of content about climate change triggers some fear.

- "You always have on Instagram, Facebook, YouTube, videos and information everywhere about climate change and what we all have to do. And you know, countdowns such as 'you have so many days left until the earth can never get well again'. And then it's very much doomsday-like thinking. And yeah anyway, I find that a little scary. (13)"

Alternatively, one participant from the Netherlands experienced a different feeling. The permanence of news on climate change, reporting worse and worse consequences worldwide, resulted in the opposite effect. Hearing about the effects of climate changes numbed this participant and made him care less about climate change. The stream of news made climate extremes feel normal and slowly eroded the urgency experienced seeing such kind of news.

- "Because there's always a lot of news, I feel less like there are extreme changes apart from the fact that every year there's a heat record, a precipitation record, because you have those kinds of records every year it starts to feel normal. And that's kind of the paradox of those extreme records. Because it's not normal because every year it's exceeded. [...] It feels satiating, you get over it a little easier. You might also get it if you read too much of the news. Then everything becomes kind of normal. Whereas news headlines tend to be about the more extreme developments in the world (2)"

A participant from France noted a different sentiment. She felt that, because the examples that tend to be presented on the news and in various media show extreme examples, it makes it difficult for people to understand the full range and scale of what climate change involves and the real consequences it may have for people. This is in her idea one of the factors leading to inability or unwillingness to act.

- "We're taking too long to realize what's about to happen [...] that in the end it will happen faster than we think because we say to ourselves 'ah we can wait [...] that it's hard to fathom the

magnitude. When you look at the media, it's all quite exceptional: entire towns flooded and buried in mud in the south of France, hectares and hectares of forests and estates going up in flames because they were big fires. (11)"

A consequence of being exposed to news and information about climate change consequences from all around the world, is that participants experienced worries not only for their local area, but also for their country as a whole, and for other countries. One Dutch participant explains seeing the impacts of climate change not at the local or even national level, but rather at the European level.

- "I notice it more in Europe than purely in the Netherlands. In summer it's hotter than it was. In winter less cold than it was. You do see a shift. But I see it more at the European level. You see more extremes there. You also see extremes in the news, less at the local level. You're more often made aware of that. (3)"

Another Dutch participant sees the changes from climate change as happening on a national scale, rather than locally because of the news which shares facts such as heat records for the whole country.

- "But that's more at the national level. (2)"

Beyond the experience of climate change, mitigative action was also experienced at a different level than the local. A French participant, when discussing the need to act and find solutions to climate change, mentions the national level and compares it to the rest of the world to express a limitation to the potential impact of action.

- "As I was saying, France is only a minute part of the world. (8)"

4.1.3 A future problem

4.1.3.1   Future generations bear the burden

Several participants expressed that climate change would not have a large effect on themself but would rather be an issue for the next generation, who would surely feel its effects

more harshly. One older Dutch participant said she felt the younger generation should feel more concerned about climate change than herself, as she will have passed when current measures will have an impact and when climate change becomes worse.

- "Because I'll be around for about 30 more years I think. Suppose I turn 90, then I'll still be around for another 30 years. Also the effect of all kinds of measures won't come for another 10 or 15 years or so, maybe even longer. So I think your generation should be more concerned about it than I am. (12)"

Several younger participants from the Netherlands and France had similar thoughts. Though noticing the impacts of climate change and being aware of the necessity of action, all held the idea that they would not be truly impacted, but that it is the next generation that will be affected in their lives and in their actions.

- "Living more frugally when we've already experienced comfort. Maybe that will be something for future generations. We won't be so affected. (8)"

4.1.3.2   *'Real' impacts far away*

A number of participants envision true change due to global warming to happen only in the future, with various time frames. Some mention a point in time, for some it's a more general 'in the future', faraway or beyond the next generation. For one younger French participant, severe impacts of climate change such as disasters like fires and floods will only significantly increase a very distant future, potentially millions of years from now.

- "If there's an increase in fires, floods and disasters, I don't know how the earth will recover. But that, in my opinion, will be millions of years from now. I don't think we'll really be affected, apart from a few disasters, but we're not going to be... It's really going to be in the years, in the future. (8)"

An older French participant thinks that in the short-term little will change, at least for his and the next generations, but that in half a millennium the world might look different from how it does now due to climate change.

- "It's sad, yes you won't live to see it yet, but I don't think the world will look like it does globally 500 years from now. And there is one thing I know for sure, which is that people always react too late. (15)"

Another French participant also relates this idea to the realization of risks. In her opinion, realizing risk happens too late. It happens only when a hazard manifests, which is at an uncertain point in the future. Hazards or climate change events are not expected to happen now or at a certain determined point. Rather, people wait to act until it finally happens, only realizing the effects of climate change when they will hit, when it is too late to avoid harm. Similarly to the previous quote, it seems that these participants look at action and inaction as somewhat of a self-fulfilling prophecy. A feeling along the lines of 'people tend to wait until it's too late, so it will be the same for us and we will wait too long to be able to do anything significant about it'.

- "The truth is, I think it's a shame, but we only realize it when it happens to us. I hope it doesn't and that we've done something about it beforehand. But yeah, when you've lost your whole house or all your possessions, when your loved ones are on their last legs or injured for things that could have been avoided a few years before. (11)"

A Dutch participant shared similar thoughts. Climate change was too distant of a fact in her personal lived experience. The lack of large climatic events and effects of climate change in the Netherlands and in her surroundings justify a lack of urgency for action.

- "It is very far away at this point. I know it's a problem and that it needs to be worked on. And that if nothing is done then it really becomes a big problem. But it's still a little too far away for that. The effects are maybe not yet clear enough for that, the impact is not yet big enough for me to really feel the effects of it. (10)"

4.2 Climate anxiety

Theme	Sub-theme

Affective symptoms	Negative emotions
	Worry
Behavioral symptoms	-
Ruminative eco-anxious thoughts	-
Anxiety about own contribution	Guilt about inaction
	Guilt about lifestyle choices
Coping	Avoidance of emotions
	Active processing
	Pro-environmental behavior

4.2.1 Affective symptoms

4.2.1.1 Negative emotions

Sadness

Several participants experience sadness due to the loss of animal and plant species, the landscapes that form the world as we know it, and what losses might occur in the future. This sadness related to participants' own experience, but also to the way future generations might experience the world. One Dutch residents explains:

- "All the diverse species that are living on the planet are slowly going extinct because of the changes we have started as humanity, the Anthropocene. It makes me really sad, because I grew up watching documentaries, I really like documentaries. And, so I know that there is a lot out there, that there was a lot out there, and that we have lost a lot already. It makes me sad to think that I missed a lot of those things, that I haven't seen them, and now that they're gone. And even more sad if I think about the fact that my children, who will come even after me, will probably be able to see even less of that. (14)"

This theme was categorized as sadness, whilst it is closely related to climate grief. Climate grief is the feeling of grief that follows the loss of natural systems that are at the foundation of identity and ways of life. It can follow the loss of ecosystems, landscapes, species, knowledge related to the local environment, or can manifest at projected loss (Comtesse et al., 2021). Climate grief is place-bound, while many of these individuals' experiences of sadness relate to loss on a more global scale, a general loss of biodiversity and landscapes, rather than in a place that can be specified. On another note, in multiple cases climate change was linked to death and the destruction of the world. This included in two cases thinking of climate change as being to humans what the meteorite was to dinosaurs, that is, a large catastrophe that will eventually result in the extinction of all human life and possibly the earth itself.

Solastalgia

Related to the concept of grief, solastalgia is a sense of loss or grief brought forth by changes in one's home environment that they are connected to. It's the sense that a place one was familiar with has changed around you (Albrecht et al., 2007). One participant experienced solastalgia when thinking about the winters of her youth, and the activities that those winters sustained, that are no longer possible. This was characterized by deep sadness, a longing for a past that is lost, and a near painful feeling.

- "Very sad. I also know people around me, my family find it very sad, because every year it's just nostalgia and everyone is asking 'oh do you remember that winter when we made that snowman […] It's almost painful when I think of all the things that we could do because we used to play, I remember when I was growing up the first thing I would do after coming back from school was put my ski pants on so that I would not be wet, and go and roll in the snow all day long. I was spending all day outside to the point where I was freezing. I was never a big fan of skiing or ice skating but I loved playing in the snow and our family would spend so much time together in the snow and I miss that so much. (1)"

Fear

Fear is another emotion that was experienced by participants when considering the changes brought on by climate change. Fear was expressed when contemplating the unknown consequences of climate change in the future "Not knowing what to expect can be frightening (8)". A fear of death was also experienced, with death being closely related to climate change

in the participant's view. Furthermore, fear was expressed when considering how individuals and animals are and will be impacted. One French participant expressed:

- "That at some point these forest fires will be everywhere, in places where it is not actually occurring now. [...] That's something I do find scary. And also that with that all those animals and their homes will go away. Those are scary things all right. For example, that it is getting hotter and hotter and in the sea and that a lot of animals will soon be gone. Those are things that I think are scary. (6)"

Powerlessness

Among participants, climate change was often seen as an inconceivably large problem that people were powerless to oppose. Powerlessness was felt on an individual scale, participants feeling too small, lacking influence, to be able to create change. One's own contribution was felt to be so small that it is nearly useless. A Dutch participant reports feeling powerless and overwhelmed, feeling like climate change goes beyond what people can conceive.

- "Powerless. Like it transcends humanity, at least me. (4)"

One French participant, when talking about how she views climate change, does not deny that there is global warming, but global warming was in her view an inevitable event that will ultimately lead to the end of the world. This led to a feeling of total powerlessness. She did not deny that humans had to mitigate climate change and adapt to changes, but eventually all action was deemed useless because of the powerlessness before global warming.

- "It's due to global warming, but I'd say that in any case we're getting closer to the sun. So it's bound to get hotter. I think we're powerless against it. Whatever we can do to prevent things from getting worse, in the end it won't do anything. For me, they are cycles: we've had a glacial era, then a warmer era, and now I think we're inevitably going to enter this much warmer heatwave era. (8)"

Frustration

A recurring emotion was frustration. This frustration was directed at others, for example when seeing people littering around the home area, concerning other people's

inaction on climate change, concerning governmental (in)action, when experiencing extreme weather conditions rendering farming work impossible, and when thinking about climate change deniers. Frustration was also experienced when thinking about the destruction of the world and the death of animals "It's frustrating, it's stupid (7)".

4.2.1.2   Worry

Worry about current impacts of climate change

Many participants experienced worry when thinking about climate change. Worries were expressed about the fate of pets, animals, nature, the sake of farmers and harvests in the future, food security, the availability of water, quality of life, the price of consumable goods in the future, the weather, the evolution of climate change over the past years, and catastrophes. One participant expressed not even knowing how or what to worry about anymore because of all the changes.

Worry for the unknown future

Several interviewees reported having difficulty concretely imagining what the future might look like and how climate change would develop. There was worry about people having difficulty understanding the scale of climate change in the future. Furthermore, participants stated they were unable to predict the future, didn't know how the future would be impacted by climate change, didn't know what would change even in the relative short term, and experienced the future as an unknown.

- "Fear, worry. We don't know what the future will be like, we're powerless against it all. (8)"

Furthermore, there was trouble imagining their own futures. One French participant compared her own vision of the future to the one her parents were able to have when they were her age and found a difference.

- "I must admit that compared to my parents, I find it much harder to project myself into the future, for various reasons, including global warming and the fact that I wonder if the world will still be livable in the 50s. (9)"

Worry for future generations

Several participants expressed worries about future generations in general, specifically their hypothetical children, and the generations after that. Worries generally focused on the quality of life that future generations would be able to have amidst climate change, and the declining biodiversity that children would be able to experience. Some, both in the Netherlands and France, expressed doubts about wanting children, for the reason that the earth would be a hostile environment to them. One French participant expressed deep worries:

- "That is why I am so hesitant about whether or not I want to have children. I don't want to have children if the world gets worse and worse. They may also want children, and I don't know how many hundred years from now, maybe something bad will happen then that will cause my great-great-great grandchildren, then I'll be long gone, but I'm already stressing that they may then experience a horrible death because the earth is in such bad shape. (13)"

Worry concerning solutions

Worries also exist concerning the solutions for climate change. Worries ranged from not knowing what to do about climate change, a lack of being able to imagine solutions, worrying about being able to involve industries and lobbies in doing their part to limit climate change, to concerns concerning the feasibility and executability of solutions. One interviewee commented that climate change as a problem was "very big and vague (13)" and another that because of the scale of the problem, "thinking in solutions is difficult at times (10)".

4.2.2 Behavioral symptoms

Most of the participants reported not exhibiting any behavioral symptoms, many stating climate change is not an issue that keeps them up at night.

- "I don't lie awake about it, but I have sometimes when I think about it I think maybe we could do this differently or little things. But it doesn't keep me awake. (6)"

However, one urban participant from France reported having trouble falling asleep after having discussions about climate change during the day or when watching films about climate change and the end of the world. When thinking about the lack of action taken towards climate changes, this participant also had the mental image of this leading to her death and to the death of her hypothetical grandchildren. This consecutively led to heart palpitations and a sort of panic attack.

- "I lie there thinking more about it then, it's not that I can't sleep at all, I take longer to fall asleep, because it's kind of spinning around in this brain. […] If I think about that when I'm in bed my heart starts beating, panic attack and so on. (13)"

4.2.3 Ruminative eco-anxious thoughts

One respondent seemed to experience ruminative eco-anxious thoughts, while another experienced them in the past. These thoughts concern both a preoccupation with personal behavior and actions and how they contribute to climate change, and what consequences this might have.

- "[…] then I keep mulling over that for a number of days. If I think about it then I keep thinking about it for a long time. (13)"

4.2.4 Anxiety about own contribution

4.2.4.1 Guilt about inaction

Many participants experienced a form of climate guilt. One way in which this guilt manifested was through the idea of not doing enough to save the environment. Multiple interviewees shared that they felt like maybe their inaction was at fault for climate change, or that their inaction contributed to worsening climate change.

- "I feel a bit like, maybe it's my fault. Individually, maybe I'm not doing enough. (7)"

4.2.4.2 Guilt about lifestyle choices, travel

Other participants experienced guilt about their personal impact when doing certain activities such as taking long showers, using certain modes of transportation such as cars and planes, about choices of consumption such as overconsumption or the consumption of meat products, and finally about bad behaviors in general that the participant may have shown or may show in the future. A participant from the Netherlands shared:

- "I tell myself 'you want to have children, and you make choices that might impact the world and make it a worse place for your children so what the fuck are you doing, are you sure you want children? (14)"

A French participant felt guilty about her patterns of consumption concerning clothing:

- "I had a way of consuming that was a bit like all teenagers used to have. And I was thinking 'oh my god with everything that's going on I feel like I'm doing everything wrong, it's horrible, I've got to change this, this, this'. (9)"

4.2.5 Coping

4.2.5.1 Avoidance of emotions

Participants engaged in strategies to cope with their feelings of worry and fear, to make sure that these feelings would not impact them. One way in which participants did this was through the avoidance of news and information that could trigger having to think about climate change. Another strategy of avoidance was to refrain from thinking about the future and looking at predictions of future hazards, as this could be the source of feelings of anxiety.

- "I try not to think too far into the future because then it quickly becomes 'I don't think it's going to work out'. (13)"

Another strategy to avoid experiencing negative climate anxiety was to close oneself off from thinking about climate change. In that case, when not having to think of climate change, some participants preferred to not think about it.

4.2.5.2 Active processing

Another way to deal with worry and negative emotions was to actively deal with these to make sure they did not have a negative impact on the person. Participants mentioned

strategies such as taking a step back, distancing themselves, and rationalizing their thoughts and feelings. This was done by putting their thoughts into perspective, reflecting on them and taking a realistic look at what lies in their power. One example from a French participant:

- "I try to take a step back and tell myself that in any case, apart from voting for the people who are the best for me, and small everyday actions, I can't do more than that. (9)"

A Dutch participant goes through a similar process when dealing with negative feelings:

- "I can't be cranky or angry or whatever for very long. So this situation, I recognize it in myself, I accept it, and I try to give it a place where at some point I will hopefully do something with it. (2)"

4.2.5.3 Pro-environmental behavior

Finally, a way to deal with anxious feelings was to take action in some form. If there is cognitive dissonance, aligning one's actions with their beliefs and worries about climate change should relieve a part of the negative feelings. One participant did this by, for example, reducing his consumption of meat.

- "In terms of food, I notice that I consciously choose to eat less or one piece of meat instead of two. (2)"

4.3 Non-engagement in pro-environmental behavior

Themes	Sub-themes
Governments	-
Industries	-
Other individuals	-

Participants who shared that they did not engage in pro-environmental behaviors or that they engage in behavior that they deemed harmful to the environment, justified this behavior to themselves in multiple ways that will be discussed in this section. From this section we understand that our living environment can impact our ways of thinking. Participants justified their own inaction by pointing at the policies and behaviors shown by others in their direct and indirect environment. This included the local and national governments, industries and other individuals.

4.3.1 Governments

Governmental (in)action was one of the ways participants justified their own behavior. A number of participants felt that politics and governments at different scales make bad choices, and they wish that governments would do more to preserve nature. Furthermore, among participants was the need for clear policy and the need for alternatives to make better choices as consumers. Moreover, it was felt that politics is where the power lies to make changes, power that is inaccessible to the people, one French participation shared that she felt "stupid (7)" when looking at efforts she could make and comparing that to the potential action, and lack of action from other states who were in her opinion light years away from her own country's climate practices, despite also not being optimal in her opinion. A Dutch participant shared that she felt fine only adapting her voting behavior and letting the rest of climate action be the responsibility of the government, because for her the government holds the power to enact change.

- "They have the power, politics has the power to make choices that matter to larger groups and the world then I think if I vote that then I'll be fine. (4)"

There also existed a sentiment of trust in some institutions, notably for Dutch participants. Because of the country's history of shaping the earth to humans' will, such as the large land reclamation projects and control over the ground water levels, there is a sense of safety that institutions can handle climate change, and that therefore it's taken care of.

- "I think there is a Dutch pride that things will be okay because it has always been this way in terms of nature, so there may be a touch of naivety there as well. (2)"

4.3.2 Industries

Another common theme among participants was the responsibility of industry for contributing to climate change, and the lack of restrictions placed on these. Participants felt like their own actions, whether good or bad for the environment, were insignificant compared to the pollution and emissions created by industries. A linked idea that was shared by several participants was that money was still valued above the climate and nature by many parties that hold power to enact change. A participant from the Netherlands stated:

- "Making profits out of killing the planet. You should have some ethics, some morals. Like think 'is this really worth it'. But for some people money comes first and it doesn't matter that you killed the planet and that future generations don't have a place to live because you just care about making money. (5)"

A French interviewee feels a sense of injustice at the fact that individuals are solicited to change their behaviors to be more sustainable while the industries are spared from measures:

- "The group of people who have the least influence on it, they have to make the most sacrifices. And those who emit the most CO2 are spared the most. That's big industry. (15)"

4.3.3 Other individuals

A number of participants justified their own lack of action by emphasizing that other people do worse. This concerned, for example, flying. Some participants assuage their guilt about using planes and cars by pointing at people who fly around the world at their leisure without worrying about the planet. Globally, this seemed to stem from a feeling of injustice when measures to mitigate climate change were experienced as having to sacrifice something. One Dutch participant was positive about measures imposed on the population as a whole, for example through laws, because it means that everyone is bound by the same rules. When adaptive or mitigative action was reliant on people's own willingness to act, it was often felt as being unfair.

- "But there will just be more restrictive measures, rules in our lives. So that we can be better for the planet. Then everybody has to follow them so fine. (4)"

5. Discussion

This study sought to further understanding of people's experiences of climate anxiety through the lens of place attachment and risk perception. The findings in this study are globally consistent with existing studies.

5.1 Risk and place

This study found that participants displayed worry about climate change and a certain risk awareness, but that this did not translate into feeling at risk locally. This was articulated in rural areas which were experienced as being resistant to changes that might be brought on by climate change, and by a refusal to accept predictions of hazards. There was awareness of risk, but this did not translate into risk perception, or feeling exposed. In both urban and rural areas, risk was often experienced as being somewhere else. Others were at risk but not participants themselves in their area. Climate change was also felt as being worse elsewhere rather than in the 'here', at the national, European, and global scale. This spatial (and temporal) optimistic bias, or hyperopia, is consistent with existing research (Gifford et al., 2009; Dunlap et al., 1993; Hatfield & Job, 2001; Uzzell, 2000; Schultz et al., 2014; Lima & Castro, 2005; Luis et al., 2005; Tenbrink & Willcock, 2023; Armas, 2006). This bias might be explained through the fact that denial is a way to avoid internal conflict. Bonaiuto et al. (1996) argued that a person's home environment that they feel attached to can be seen as being part of the self-concept, part of people's identity. Twigger-Ross et al. (2003) posit that when that identity is at risk, for example by environmental threats, denying the threat is a strategy to cope with it, to retain a positive place identity. Lower risk perception might also be used by people with high attachment to deal with cognitive dissonance (Bernardo, 2013). Furthermore, participants shared learning about climate change through the news and through various media. Mass media coverage could have raised awareness and sensitized people more to global issues rather than local issues (Schultz et al., 2014). Furthermore, more information may lead to the normalization of risk, a way of psychologically coping with the threat by decreasing judgement as to the severity of the risk (Luis et al., 2015). Overall, this optimism bias is somewhat problematic for pro-environmental behavior. It is associated with a high degree of perceived control, and as such that action at the local level is not needed. At other scales however, a low feeling of control over general environmental degradation, that

personal actions can't do much and that collective action is needed, which is generally the case for effects of climate change at a larger scale, can lead to lower optimism. Optimism bias can inhibit pro-environmental behaviors, which is an issue. Thinking about global issues may lead to people not accepting their personal risk, thus reducing pro-environmental behaviors (Hatfield & Job, 2001). Finally, it is worrying because it can also lead to a lack of preparedness to face the impacts of climate change. Lima & Castro (2005). However, the link between place attachment, risk awareness and worrying, and risk perception remains contested and unclear. For example, Hogg et al. (2024) found that anxious feelings can create alertness to environmental threats which can stimulate information seeking concerning the threats and stimulate action to reduce the threat, which supports an opposite idea.

This study also supports existing research through the finding that risk perception is linked to length of residence, which is a factor in place attachment. A number of French participants in this study reported self-experienced and collective hazard memory concerning heatwaves. This is related to place attachment in the sense that length of residence and familial and friendly ties usually provide people with either experience of hazards in an area or communication with people who have that experience (Lie et al., 2023). Several participants residing in the Netherlands reported lacking this memory. This was due to not being exposed to the climate of the place of residence for a long period, resulting in the participants feeling unable to compare current weather, supposedly subject to climate change, compared to a 'normal'. This is also consistent with the fact that place attachment can be inherited through transmission of memories between the different generation that live in a place (Domingues et al., 2021). Participants expressed experiencing less or no worry locally in this place they were less familiar with. As such, lower place attachment might be cause for less climate anxiety, at least for local areas. Anxiety may still exist concerning global climate change. However, this may be a barrier to pro-environmental behavior both on a local and global scale, as increased climate anxiety has been found to have a positive relationship with pro-environmental behavior (Hogg et al., 2024). As worrying on a global scale has been shown to not effectively lead to pro-environmental behavior, as perceived individual responsibility to respond to environmental issues is negatively related to (Uzzell, 2000).

5.2 Climate anxiety

The affective and behavioral effects that participants in this study experience concerning climate change, such as a worrying about the various effects of climate change, worrying and fear about the future, powerlessness, feeling overwhelmed, feelings of solastalgia and loss, rumination and guilt, generally correspond to the existing research on climate anxiety (Hogg et al., 2021; Pikhala, 2020; Cunsolo & Ellis, 2018; Albrecht et al., 2007;

Comtesse et al., 2021; Doherty & Clayton, 2011; Ogunbode et al., 2022). Hogg et al. (2024) found that individuals who ruminate on eco-anxious thoughts tend to engage highly in pro-environmental behavior. The findings in this study somewhat support this through the fact that the only participant who reported ruminating on eco-anxious thoughts was also vocally very positive about the personal impact individuals can make, as opposed to many participants who felt their personal actions were futile.

5.3 Coping with climate anxiety

Participants of this study used three mechanisms to cope with climate anxiety, the first was to avoid emotions and feelings concerning climate change through avoiding information about climate change and through closing oneself off from thinking about it. Participants also used active processing and rationalizing to deal with their anxiety, and finally some engaged in pro-environmental behavior. This is in line with existing research. Pikhala (2020) identifies engaging in climate action and reducing media exposure as ways to deal with climate anxiety, The findings are also consistent with some of the coping measures of Homburg et al. (2007) such as expressing emotions, problem solving and relativization, and with the emotion-focused, problem-focused, and meaning-focused (positive reappraisal) strategies as identified by Ojala (2018). Avoiding maladaptive coping mechanisms is important to avoid losing engagement and to foster adaptive and mitigative behaviors.

5.4 Non-engagement in pro-environmental behavior

The finding that participants identified others not engaging in pro-environmental behavior a reason to personally also not participate in pro-environmental behavior could potentially be explained by the finding of Ogunbode et al. (2022) that climate anxiety has a positive relationship with the belief that others are also distressed about climate change. Inversely, others not worrying about climate change and not engaging in pro-environmental behavior could indeed lead individuals to not be engaged. Another explanatory factor might be that people tend to view themselves as having more favorable and less unfavorable qualities than the average person (Baumeister, 1999). Participants explained their non-engagement in pro-environmental behavior by stating that 'others do worse', that they were allowed to maintain their 'bad' behaviors because it was still better than other people were doing.

Furthermore, concerning the finding of trust that institutions will act to adapt to climate change, to the point where maybe individuals need to be less involved, one participant put it into words as being a bit of national pride. There has historically been a culture of managing nature in the Netherlands which seems to have created a sense of trust among a

number of Dutch participants. Gifford et al. (2009) theorize that national pride can be one factor that contributes to being optimistic about one's own area. This could also be a coping mechanism, identified as wishful thinking, anticipating a positive outcome, as identified by Homburg et al. (2007) and with the trust strategy identified by Ojala (2018).

6. Conclusion and limitations

6.1 Conclusion

This thesis sought to investigate French and Dutch rural and urban residents' experiences of climate anxiety related to their place attachment and risk awareness and perception. To achieve this, a qualitative study was performed using semi-structured in-depth interviews with 15 participants from the Netherlands and France. The study sought to answer the question 'What is the role of place attachment on risk perception and the experience of climate anxiety in rural and urban areas of the Netherlands and France?'. To answer this question, from the results of this study it seems that place attachment can stimulate climate anxiety, because people are aware of the changes happening around them which causes worry and anxiety. However, place attachment can also occlude risk perception. Attachment to a place can cause individuals to avoid information seeking and to refuse to accept risk, which can also reduce climate anxiety. This spatial optimistic bias was especially present in rural participants. However, place attachment cannot explain everything. Climate anxiety was experienced concerning climate change as a whole, on more levels than only the local. Global issues cause great worries, perhaps more so even than local ones. Participants are made aware of global issues through diverse media. No unanimous causal relationship has been found between risk perception, place attachment, climate anxiety, and coping behavior, and neither has this research. Nonetheless, ameliorating the understanding of people's experiences of risk is useful to increase resilience against the effects of climate change by understanding how they react to and understand risk. Pro-environmental behavior is ultimately an important concern because engaging people in mitigating and adapting to climate change, both at a local and global scale is necessary to cope and reduce future risk of climate change. Increasing citizen engagement is an important issue for governments, non-governmental organizations and businesses. It is primordial because certain unsustainable and carbon-intensive behaviors need to change to mitigate the climate crisis (Scannell & Gifford, 2015). This study has contributed by providing support for existing theories concerning place and risk perception

(Gifford et al., 2009; Dunlap et al., 1993; Hatfield & Job, 2001; Uzzell, 2000; Schultz et al., 2014; Lima & Castro, 2005; Luis et al., 2005; Tenbrink & Willcock, 2023; Armas, 2006), climate anxiety (Hogg et al., 2021; Pikhala, 2020; Cunsolo & Ellis, 2018; Albrecht et al., 2007; Comtesse et al., 2021; Doherty & Clayton, 2011; Ogunbode et al., 2022), and coping mechanisms (Homburg et al. 2007; Ojala, 2018; Pikhala, 2020). Future research could focus on finding empirical support for the relationship, and quantifying the relationship between place attachment, risk awareness, and climate anxiety in rural and urban areas.

6.2 Limitations

This research has a number of limitations. First, the participants in this study were primarily female, with only two out of the 15 being male. The lack of male perspectives in this study could lead to some bias, for example, Scannell and Gifford (2015) found that women scored higher on climate change engagement than men. Furthermore, the vast majority of the participants were young and educated, being aged 20 to 30 years old, though there were some older participants. This might also have influenced findings, as younger people, simply due to being alive for a shorter period, have fewer personal experiences of hazards than older people. Furthermore, it might be that younger individuals use various media more than older participants, which could increase worrying overall, and worrying about climate change at the European or even global level. Future research could try to shed light on this. Furthermore, the broadness and the choice of the research area might limit the usefulness of the results. While interesting to obtain insights into both urban and rural perspectives in the Netherlands and France, the participants only come from one region in France - the Pays de la Loire, and three provinces in the Netherland - Groningen, Friesland, and Flevoland. Due to their characteristics, different results might be obtained when doing this research in the Randstad and the Île-de-France region, or in the South of France which is even more exposed to hazards and touched by climate change. Finally, the time constraints somewhat added to this by limiting my ability to select participants.

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Appendix A: Demographic table of participants

Participant	Age	Gender	Occupation	Rural/Urban	NL/FR
1	20-30	F	Student	Urban	NL
2	20-30	M	Employee	Rural	NL
3	50-60	F	Employee	Urban	NL
4	20-30	F	Employee	Urban	NL
5	20-30	F	Student	Urban	NL
6	20-30	F	Employee	Urban	FR
7	20-30	F	Employee	Rural	FR
8	20-30	F	Employee	Rural	FR
9	20-30	F	Student	Rural	FR
10	20-30	F	Student	Rural	NL
11	20-30	F	In between jobs	Rural	FR
12	50-60	F	Employee	Rural	NL
13	20-30	F	Employee	Urban	FR
14	20-30	F	Employee	Urban	NL
15	60-70	M	Farmer	Rural	FR

Appendix B: Interview guide

Place attachment

- What place would you consider important to you?
- How would you describe this place?
- How long have you been living in/working in/going to this place?
- How do you make use of this place?
- In what way do you feel connected to this place? In what way are you connected to other people who live there or who come to this place? In what way are you part of a community in this place?
- What do you like about this place? Why is it important to you?
- In what way is this place present in your daily life / In what way does it add to your personal life?

Risk perception

- Do you believe climate change is happening? Is real?
- How do you see/experience climate change in the place of importance?
- What would you say are the most common effects of climate change in this place?
- What aspects are most important?
- How has climate change evolved in this place over time?
- What do you think will change in the future? How likely is it to change?
- To what extent is your use of this place / your activity at risk because of climate change?
- How do you think your use of this space might change because of climate change?

Experience of climate change, climate anxiety

- How often do you think about climate change?
- What thoughts and feelings arise when you think about how that place is changing because of climate change? Positive? Negative?
- What thoughts and feelings arise when you think about climate change in general?
- What are you most worried about?
- How do these thoughts/feelings/worries impact you?
- How do you envision the future of this place? How do you see your future in this place? Positive negative?