EARTHQUAKES IN GRONINGEN AND CLIMATE CHANGE ACTIVISM

The effect of place disruption on environmental civic behaviour in relation to climate change

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THE EFFECT OF PLACE DISRUPTION ON ENVIRONMENTAL CIVIC BEHAVIOUR IN RELATION TO CLIMATE CHANGE

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I. PREFACE

Dear reader,

I am very proud to present to you the cherry on top of my master Environment & Society Studies, which is this master thesis. During my masters, both climate change and the earthquakes in Groningen were often in the news. Since I am a climate activist myself, and I found the case of 'Groningen' quite remarkable, I wanted to investigate to what extent people see a link between these two matters. It was a pleasure to start this thesis at DeGoedeZaak, and I am very proud that I can now present them the findings of my research. During the time of writing my thesis, I faced several challenges, like combining this project with my work and the Covid-19 pandemic did not make the process any more fun either. However, these challenges are a part of life and I am proud that I have faced these challenges and learned from this experience.

I would like to use this preface to thank the people for the helping me writing this thesis. Firstly, I would like to express my sincere thanks my supervisor Dr J.D. Liefferink for his critical remarks and patience. Second, I would like to thank to thank Jurjen van dern Bergh and Eline Peters for the opportunity to start and carry out my thesis during the time of my internship at DeGoedeZaak. I would also like to thank the people and organisations who shared the survey of this research: DeGoedeZaak, GroenFront!, Groninger Gasberaad, Groninger Bodem Beweging, Liesbeth van Tongeren, Annemarie Heite & Sandra Beckerman amongst others. Furthermore I would like to thank my mom, Henny Bruinekool, and friends for their insights and support during the time of writing my thesis. Lastly, I would like to thank everybody who filled out the survey for my research.

Enjoy reading!

Lisa Busink

Nijmegen, July 2021

II. Executive Summary

Two subjects of protest in 2019 in The Netherlands were climate change and the earthquakes in a province called Groningen due to the natural gas drillings. Since climate change and the earthquakes both share a cause, namely the fossil fuel industry, this research looked if there was a link between these two subjects by investigating if the people affected by the earthquakes in Groningen participated more in climate change activism than other people in The Netherlands.

By comparing the people from Groningen to other Dutch people on the extent to which they participated in climate change activism in the past 6 months prior to conducting the survey-data, it was possible to see the differences between these groups of people. Besides measuring extent to which the people from Groningen were affected by the earthquakes, both psychological and physical (like living in a damaged house), the extent to how much someone identifies with the province of Groningen was measured. All people were also asked to indicate to what degree they perceive climate change as a threat.

The people from Groningen did participate less in climate change activism than other people. The people from Groningen also indicated that they worried less about climate change than the other people. When this perceived environmental threat was taken into account in the analyses, there were no significances between the groups. This indicates that the difference in climate change activism between the groups was probably caused by the difference in the way the people perceive climate change as a threat. More research is needed to detect why there is a difference in the perception of climate change as a threat between the regions.

The people who were only psychologically affected by the earthquakes showed a moderate to strong correlation from 'perceived place disruption' to place identity, meaning that people the stronger they feel connected to the province of Groningen, the more they were psychologically affected by the earthquakes. However, the people who were also 'physically affected', for example by living in a damaged house, they did not show a significant correlation. More research is needed to clarify what factor this 'physical place disruption' plays between the process of place identification.

The survey was filled out by relatively more young and politically left-wing and progressive orientated people than the general Dutch population. Therefore, this research was generalizable for only this specific groups of people. Regardless of this, this research was good to detect if the statements from the scholars on the relevant subjects of this research were empirically findable.

TABLE OF CONTENTS

III. LIST OF TABLES AND FIGURES

1. INTRODUCTION

Places are important to people. The street you grew up in, or the town where you lived on your own for the first time, or the place where you work: they mean something to you and may even evoke some feelings or emotions. You may even introduce yourself to someone by telling them that you grew up in a certain city or village. These mechanisms are part of the concept place identity.

Over time, places change: old buildings get demolished and new ones are being built. Some changes are gradual, like urbanisation, while other changes are abrupt, for example when a city or village is being destroyed after a natural disaster. These spatial changes may also evoke some emotions to the people that these places are important to and these changes can be perceived as disruptive. This is called place disruption, and when place disruption is expected or has already happened, people who identify with these places tend to express some opposition (Devine-Wright, 2009). This opposition could be manifested by activism or via the media.

Several scholars (Dear, 1992; Petts, 1997; Hoepman, 1998; Warren, Lumsden, O'Dowd & Birnie, 2005; Hubbard, 2006; Wolsink, 2006; Burningham, Barnett & Thrush, 2007; Devine-Wright, 2009) have researched the concepts of place identity and place disruption and how these phenomena can result in local opposition. 'Not in my Backyard' or NIMBYism is a phenomenon that is often used in this context, which refers to opposition of residents when changes in place are planned which are perceived as negative. Wind turbines or highways are often a subject to NIMBYism. While NIMBYism is maybe the most common concept in the context of local opposition and place disruption, it is also critiqued because the concept is vague and not really useful (Dear, 1992; Petts, 1997; Hoepman, 1998; Warren, Lumsden, O'Dowd & Birnie, 2005; Hubbard, 2006; Wolsink, 2006; Burningham, Barnett & Thrush, 2007; Devine-Wright, 2009). However, place disruption and opposition from residents as a response to that place disruption seem to be the main phenomena that are highlighted when NIMBYism is being discussed in the literature (Dear, 1992; Petts, 1997; Hoepman, 1998; Warren, Lumsden, O'Dowd & Birnie, 2005; Hubbard, 2006; Wolsink, 2006; Burningham, Barnett & Thrush, 2007; Devine-Wright, 2009).

One aspect that is critiqued about NIMBYism that the perception of the place disruption is not always the same. For example, some people who are in favour of clean energy do not want a wind turbine in their backyard, while other people may think that wind turbines are nonsenses and they do not want wind turbines in anyone's backyard, 'NIABY'. Related to this, but what is not researched by scholars who write about NIMBYism, place disruption or local opposition, is whether people who have a 'NIABY' position towards certain developments, also express opposition towards related issues.

This thesis focusses on that, and reports about a scientific investigation on a case of place disruption in a Dutch province called Groningen. In Groningen drillings for natural gas are the cause of earthquakes, which damaged a lot of houses and caused a lot of anxiety to the residents in that area. This led to an intense public debate about the consequences of the natural gas drillings in Groningen. Simultaneously, people in The Netherlands expressed their worries about climate change by attending mass demonstrations. Since natural gas is part of the fossil industry which can be seen as a major driver of climate change, and the two issues – the earthquakes in Groningen and climate change – were high on the public agenda in The Netherlands during the time this thesis was written, this thesis links these issues to each other in order to find out if place disruption can lead to public opposition on

a related issue. In other words: since the earthquakes in Groningen and climate change have a similar driving force, the fossil industry, do victims of the earthquakes in Groningen behave more activist on climate change?

First, more background information on both Groningen and its earthquakes, and climate change activism is presented in this chapter. Thereafter, the research aim of this thesis, the scientific and societal relevance of this thesis are presented. This chapter concludes with an overview of the structure of this thesis.

1.1 Earthquakes in Groningen

One of the largest natural gas field of Europe is located in Groningen and since 1963 the *Nederlandse Aardolie Maatschappij* (NAM; Dutch Petroleum Company) is drilling and exporting the natural gas from there. The Groningen field is located in the eastern part of the province of Groningen and covers an area of approximately 900 km^2 – which is approximately 39% of the Groningen land area (Van der Voort & Vanclay, 2015, p. 2). The gas field contained 2800 billion m^3 gas of which less than 250 billion m^3 is left (Centraal bureau voor de Statistiek, 2020). Although the NAM already knew in 1963 that subsidence and earthquakes could occur because of the gas drillings, and some politicians warned for this already in the 60's and 70's of the twentieth century, the Dutch government allowed the NAM to drill for gas in Groningen (Andere Tijden, 2015, 18th of February). On Christmas day 1986, the first earthquake with an intensity of 3.0 on the Richter scale happened, but still the discourse around gas extraction in Groningen was rather positive, since the Dutch economy is so dependent on the gas drillings.

That changed after the earthquake in Huizinge in 2012 (which had an intensity of 3.6 on the Richter scale), which not only caused a lot of damage on houses, but also started the anger, despair and fear amongst the Groninger people (Volkskrant. 2019, 19th of December; Blanken, 2014, 11th of January). For the first time, residents, media and politicians demanded that the drillings needed to stop. In the beginning of 2013, the State Supervision of Mines (SodM) reported that there was a 7% chance of an earthquake with a magnitude between 4.0 and 5.0 within the next twelve months (SodM, 2013 in Van der Voort & Vanclay, 2015, p. 1). However, Henk Kamp, Minister of Economic Affairs at that time, was reluctant to stop or reduce the gas drillings due to contractual commitments (NRC, 2013a in Van der Voort & Vanclay, 2015, p. 1).

Most of the earthquakes occur in areas where small villages like Ten Boer, Appingedam and Loppersum are located. But recently, also the more urban areas were hit with earthquakes, like in Groningen city on the 22nd of may in 2019 with a magnitude of 3.4 (NU.nl, 2019, 22nd of May). In 2016, 100.000 people in the province of Groningen lived in houses which are damaged by the earthquakes, which is approximately one fifth of the entire Groninger population (Ekker, 2016, 4th of September). Figure 1 shows where all earthquakes due the gas drillings occurred from 1981 to 2017.

For years, the Groninger people lived with small earthquakes, but since 'Huizinge' and the SodM report, concern and anger grew. This was also fuelled by the lagging claim handling for people with damaged houses to get compensation and the feeling that the Dutch government felt a lack of urgency when it came to the earthquakes (Provincie Groningen, 2019, 29th of October). At the same

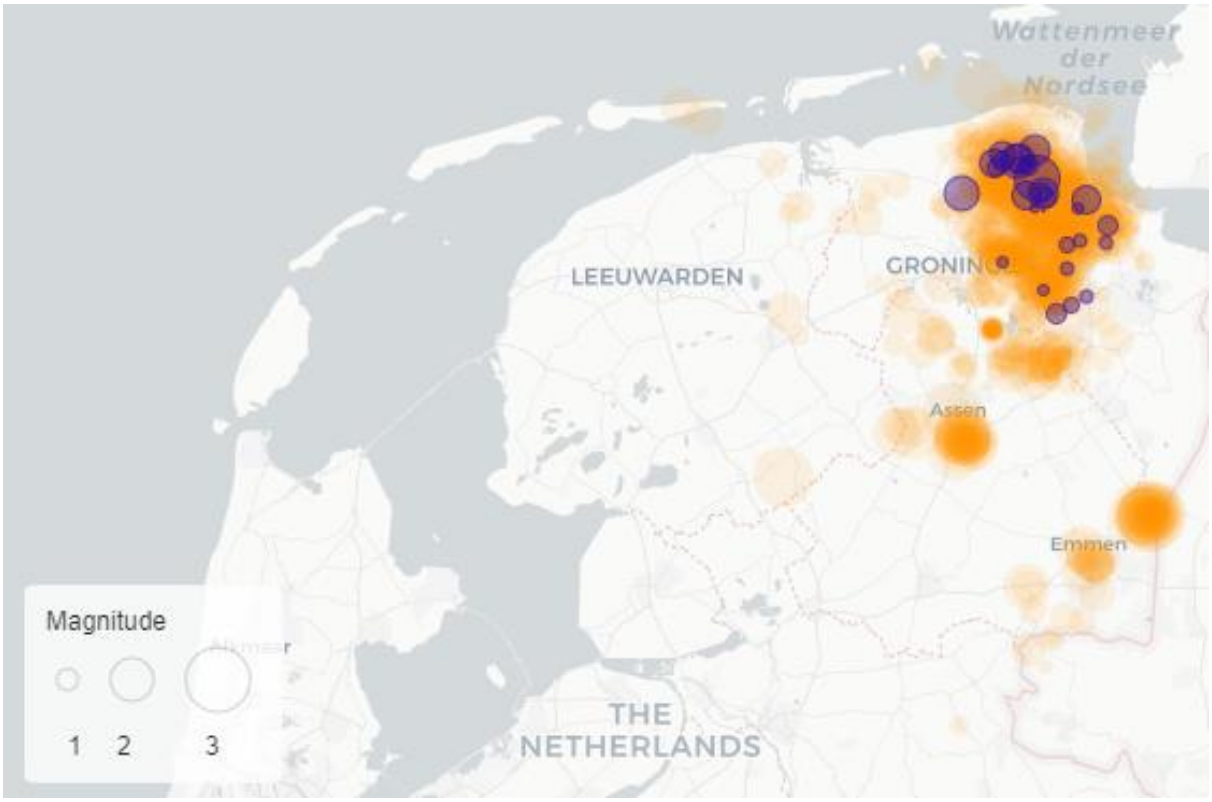


Figure 1 All earthquakes in the North of The Netherlands in the period of 1986-2017 (KNMI, 2017).
The seismic zones in purple happened in 2017. The orange zones indicate seismic activity before 2017.

time, housing prices in Groningen started to drop. These issues together drove the people into activism and loads of protests followed (In 't Veld, 2018, 30th of August; Greijdanus & Postmes, 2019).

More than 5 years after 'Huizinge', on March 28th 2018, a new Minister of Economic Affairs and Climate Policy, Eric Wiebes, announced that the gas drillings would stop in 2030. However, this did not stop anger and activism in Groningen, as the frequency and intensity of earthquakes was not declining, many people are still waiting for financial compensation and housing prices are still not as high as they used to be. This led to a parliamentary investigation on the 'Groningen and the natural gas drillings' which started on the eleventh of February in 2021 (Tweede Kamer, 2021, 11th of February). This parliamentary investigation is meant to clarify how the decision-making came about for the natural gas drillings, damage claim handlings and the reinforcements of the houses (Tweede Kamer, 2021, 11th of February). Besides that, people are worried that closing down the gas drillings will be postponed or think that 2030 is too late.

1.2 Climate activism

As said before, activism for climate change was on the rise in The Netherlands as well, especially in 2019 before the Covid-19 pandemic. Millions of children started to skip class in order to protest inspired by the then 16-year-old Swedish girl Greta Thunberg. On the February 7th 2019, 10.000 kids skipped school to attend the biggest climate protest in The Netherlands until then (Nagtegaal & Peek, 2019, 7th of February).

But climate activism was not only participated in by youngsters and typical activists in The Netherlands. On March 10th 2019, 40.000 people gathered on Dam Square in Amsterdam in the pouring rain, to demand more ambitious climate policy by the Dutch government (Het Parool, 2019, 10th of March). Later that year, on the 27th of September, 30.000 people showed up for the climate strike in The Hague (NOS, 2019, 27th of September). These were the first big protests for climate change in The Netherlands.

Some organisations and activist groups in Groningen which are protesting and campaigning to close the Groningen field down, are also concerned and working on combatting climate change. GroenFront! and Code Rood are two examples of those groups. This makes sense, as the NAM is not only responsible for the earthquakes in Groningen, but is also contributing to climate change – not only directly by maintaining the fossil fuel industry, but also indirectly as the NAM is owned by ExxonMobil and Shell which are two of the biggest fossil fuel companies in the world.

1.3 Research Aim

The aim of this research is to extend the knowledge on place disruption and its societal impact. By researching if there is a correlation between place disruption in Groningen and climate change activism, this thesis is contributing to the literature on place disruption and looks specifically into whether victims of place disruption behave more activistic on related issues.

This study is fundamentally theory-driven, yet it may also have practical implications. Because the theoretical framework provides essential background information for the research questions, the research questions of this study will be presented after the theoretical framework, in chapter 3.

1.4 Scientific Relevance

This research contributes to the scientific literature on place disruption and related concepts. By researching place disruption in relation to climate change activism, this thesis builds on scholars like Devine-Wright (2009), Dear (1992) and Wolsink (2006) who reported extensively on the topic of place disruption and its effect on residents and their behaviour. By investigating if the cause of place disruptive events matters to people and by researching to what extent people also act on that, this research contributes to tightening the research gap.

By researching this, other concepts were used and build upon. Besides several place related concepts, literature from Finkel, Muller & Opp (1989) amongst others, on activism was used to better understand the driving forces of activism. This was used besides literature on activism that is specifically focused on climate change, from Alisat & Riemer (2015) and Roser-Renouf, Maibach, Leiserowitz & Zhao (2014) amongst others. This research builds and reflects on the work from these scholars and therefore contributes to the scientific literature on activism in general and on activism for climate change specifically.

This thesis builds on the existing literature and reflects on the used literature. Besides reflecting on the literature, the reflection on this thesis itself is also useful for scholars who want to use one or more of the used concepts for their own research.

1.5 Societal Relevance

This research is also relevant to society, as it researches some consequences of a place disruptive set of events which had quite a societal impact in The Netherlands. Besides that, this research investigated to what extent the place disruptive events have had an impact on the people living in the earthquake zone and people who identify with the province of Groningen, which was needed for the research. This inquiry alone is relevant to society, as it provides insights on the personal damage and impact of the earthquakes in Groningen. This insight could be useful for policymakers who work on the case of Groningen.

Besides that, this research provides useful information for non-governmental organisations and grassroot organisations, since the insights provided by this research on activism in general and in The Netherlands specifically can be useful for these organisations. Therefore, the insights provided by this research on climate change activism is beneficial for people who want to contribute to combatting climate change, since some scholars argue that grassroot organizing and activism is one of the most impactful ways to contribute to combat climate change (Roser-Renouf, Maibach, Leiserowitz & Zhao, 2014).

This research was done with the help of the Dutch organisation DeGoedeZaak, which is a non-profit campaign bureau that creates campaigns on several societal issues in order to get to a progressive, inclusive, fair and sustainable future. DeGoedeZaak is interested in the effects of the earthquakes on the residents of Groningen, and what drives the Dutch people into more activistic behaviour. For this research, a framework was used to measure different levels of climate change activism, called the Environmental Action Scale. This framework can also be helpful for DeGoedeZaak and other organisations to better understand climate change activism in The Netherlands.

1.6 Structure of thesis

This thesis consists of six chapters. The next chapter displays the theoretical framework. The literature on place identity and place disruption is being discussed in that chapter and the chapter defines the type of activism this research is focussing on: environmental civic behaviour. The third chapter elaborates more on the research gap and it provides the conceptual model, the research questions and the operationalised theoretical concepts. I chose to introduce the research questions after the theoretical framework, as this research intends to fill a theoretical gap. Also, the questions make more sense when the theoretical concepts are introduced properly.

In chapter four, the methodological choices of this research will be explained. In this chapter, the research strategy, methods and validity and reliability will be discussed. The survey for this research will be explained in this chapter as well.

Chapter five presents the results of the analysis of environmental civic behaviour in Groningen and shows a comparison between the people from Groningen with the people from somewhere else from The Netherlands. The last chapter, chapter six, draws the conclusions of this research and displays the recommendations for further research and for nongovernmental organisations and grassroots action groups. In addition, the limitations of this study will be discussed.

2. THEORETICAL FRAMEWORK

This chapter is the theoretical framework where this research is based on. First, the concepts related to place will be discussed. Second, the concepts related to activism are presented. This chapter discusses many concepts and argues on why certain concepts are used for this research. Besides that, the background information of these concepts provides relevant information in order to better understand the research choices of this research and the interpretation of the results. This chapter is the theoretical bridge between the introduction of this thesis, which introduced the research aim, and the conceptualisation of this research, which follows in chapter 3, which iterates in more detail the research gap of this thesis.

2.1 PLACE

The introduction of this thesis gave a brief overview of some relevant concepts of place. This section is a more in-depth literature review of these concepts and how they relate to one another. First, a contemplation of the concepts place attachments and place identity is given, in order to argue which concept is the best fit for this research. Thereafter, place disruption will be defined. To conclude this section, an amplification of place protective behaviour is given, which is the concept that captures the behaviour of residents as a response to place disruption.

2.1.1 PLACE ATTACHMENT & PLACE IDENTITY

This thesis opened with the notion that places can evoke feelings or emotions to people. There are two concepts related to this phenomenon: place attachment and place identity.

Place attachment is the process of someone attaching to a certain place and the product of this (Giunliani, 2002). Place attachment has been defined as:

'Positively experienced bonds, sometimes occurring without awareness, that are developed over time from the behavioural, affective and cognitive ties between individuals and/or groups and their socio-physical environment' (Brown & Perkins, 1992, p. 84).

Places like someone's home or neighbourhood are often places where people are positively attached to (Manzo, 2003). This correlates with the length of dwelling (Brown & Perkins, 1992) and it has social and physical dimensions (Hidalgo & Hernandez, 2001). Someone can feel attached to a specific place, a neighbourhood, a city or a country (Manzo & Perkins, 2006). Place attachment can be seen 'as a holistic framework of place that encompasses different spatial scales […] – as a nodal point within a complex web of social interactions which may stretch over local, regional and national boundaries' (Massey, 1995; Devine-Wright, 2009, p. 427). The process of attaching oneself to a place can be determined by socio-political aspects of place, which can be influenced by group level interests (Manzo, 2005). Therefore, a desire to leave can be triggered by negative experiences (Devine-Wright, 2009, p. 428).

Place attachment is a holistic, complex and multifaceted concept that requires systematic analysis (Low & Altman, 1992, p. 3). The concept is often used in studies to find out its' correlation to

migration, environmental behaviour (see section 2.2.2) and how people adapt to new situations (Low & Altman, 1992, p. 2).

The ways in which symbolic or physical attributes of a certain location contribute to a person's identity is part to the concept of place identity (Prohansky, Fabian & Kaminoff, 1983). Scholars have had various ways of approaching the concept, which some of them focussed their research on the process of formulating an individuals' place identity, while some of them focussed on the social aspects of the concept (Devine-Wright, 2009, p. 428). Especially the latter is relevant for this research.

Prohansky, Fabian & Kaminoff refer to place identity as 'cognitive substructure of self-identity which consists of an endless variety of cognitions related to the past, present, and anticipated physical settings that define and circumscribe the day-to-day existence of the person' (1983, p. 62). Place identity, therefore, not only refers to physical realities, but also contributes to an individual's social meanings and beliefs (Prohansky, Fabian & Kaminoff, 1983, p. 62). To illustrate, the particular neighbourhood someone grew up in can determine someone's morals and values.

Bonnes, Giuliani & Bonaiuto distinguished 'personal place identification' and 'social place identification' as two directions of place identity (1995; Devine-Wright, 2009). Personal place identification can be seen as a place becoming a part of someone's identity (e.g., 'Rome has become a part of me), while social place identification is the other way around (e.g., 'I feel completely Roman'). This approach to place identity is not very precise, however this approach captures what can be triggered when negative events or disruptions occur. For example, when a shooting occurs in Rome, someone who feels at home in Rome, who identifies as a Roman, may get more emotional than someone who does not feel at home in Rome.

Place attachment can be seen as a part of place identity, but the concept of place identity goes beyond to what place attachment is (Hauge, 2007, p. 46). Place identity can be seen as a 'potpourri of memories, conceptions, interpretations, ideas, and related feelings about specific physical settings, as well as types of settings' (Prohansky, Fabian & Kaminoff, 1983, p. 60). Contrary to place attachment, place identity cannot be conceptualised as a systematic framework but is rather a schemata of perceptions and ideas that also concerns the physical environment (Neisser, 1976; Piaget, 1954).

The concepts place attachment and place identity have strong overlaps and are often used interchangeably. However, for this research place identity is used, since it does not require a schematic framework to research and it still captures the importance of a place to a person. Besides that, place identity is more focussed on the perception and a meaning of a place to a person, and how it influences one's morals and values than place attachment does.

2.1.2 Place disruption

When a place changes, this can have an impact on people. This is called place disruption. Spatial change can unveil certain bonds between a person and a place that are otherwise latent (Brown & Perkins, 1992), which possibly results in emotional responses like anxiety (Fried, 2000), and a sense of displacement which can lead to psychiatric trauma (Fullilove, 1996). This is called place disruption.

Loads of sorts of change can cause place disruption, varying from physical change – like new wind turbines near the neighbourhood – to social change – like new neighbours – to abrupt change – a burglary for example (Devine-Wright, 2009). Key to the concept of place disruption is that change makes the experience of a place to individuals or communities different. Devine-Wright notes that place disruption is a concept that is 'characterized by extent, rapidity and control, and unfolds over time as individuals make sense of what has happened or is about to happen, and attempt to cope accordingly' (2009, p. 429).

Both Brown and Perkins (1992) and Inhalan & Finch (2004) proposed three-stage models for place disruption:

- Pre-disruption: preparing for change and anticipating for possible futures (Brown & Perkins, 1992). Behaviours associated with this stage are behaviours like imagining the act of migrating to another place.
- Disruption: the disruptive event itself. Emotions of grief and loss are often emotions linked to this stage (Fullilove, 1996; Fried, 2000).
- Post-disruption: coping with the change. People tend to seek for new spatial bonds when they are coping with the disruptive event (Devine-Wright, 2009, p. 429).

While this three-stage model helps with understanding what kind of psychological processes may occur due to spatial change, the stages do not follow each other chronological per se and some responses after place disruption are not exclusively committed to each stage. Emotions of grief can also occur in the pre-disruptive stage, for example. Besides that, the way a place is experienced can change gradually instead of abruptly, what the three-stage model suggests, for example when new communities form when a lot of migration happened. Change, especially gradual change, is interpreted by a social milieu, influenced by interpersonal communications and the media (Devine-Wright, 2009, p. 429). Thus, the social responses caused by spatial change are an important part to the concept of place disruption.

2.1.3 Place protective behaviour

When place disruption takes place, people, especially people who have strong bonds with that place, often respond to those disruptive events with some form of opposition (Devine-Wright, 2009). This can be in the form of activism, or via local politics or via the media (Devine-Wright, 2009, p. 435).

One of the most commonly known concepts of place protective behaviour is known as a 'Not In My BackYard' response, or NIMBYism. NIMBYism refers to the opposition from local residents to new developments near their homes. Residents often concede that these developments are necessary, but not near their homes, hence the term ''not in my backyard'' (Dear, 1992, p. 288). Some may say that earthquakes due to the gas drillings in Groningen are an utterance of NIMBY – as natural gas is still necessary for The Netherlands at this moment.

However, the concept is extensively critiqued, since the concept is not very precise. There is no real scientific framework surrounding NIMBY, and therefore, it is not a useful concept for this research (Dear, 1992; Petts, 1997; Hoepman, 1998; Warren, Lumsden, O'Dowd & Birnie, 2005; Hubbard, 2006; Wolsink, 2006; Burningham, Barnett & Thrush, 2007; Devine-Wright, 2009).

Place attachment, place identity and place disruption form a basis for the psychological aspects of place protective behaviour (Devine-Wright, 2009, p. 432). However, threats to place identity do not lead to local opposition, or place-protective behaviour, per se. Before elaborating more on the correlation of place identity, place disruption and place-protective behaviour, an explanation on the concept of place protective behaviour is needed.

Place protective behaviour is the behaviour people partake in, to protect certain places. These places are often places which are valuable to the individual, for example when they are attached to these places. Place protective behaviour include actions like signing petitions, writing letters to political representatives and engaging in collective protests (Devine-Wright, 2009, p. 435).

Not many scholars have researched the correlation of place identity and public opposition. However, Vorkinn & Riese showed in their study that the more people feel attached to a place, the more negative people tend to be to a proposal of change when people interpret that change as something that threatens that place (2001). Place identity and place protective behaviour correlate negatively, when a certain development is interpreted by people as something enhancing to that place, on the other hand (Devine-Wright, 2009, p. 434). The evaluation of change as a threat or enhancement is influenced by how the media reports on it and communications by local people (Devine-Wright, 2009, p. 433). During this process of evaluation, individuals and groups with different interests at stake try to influence the public debate. This process is also influenced by place attachment and place identity, since 'strongly attached individuals would be expected to take an interest in what is going on locally, and to talk about and potentially take action to deter unwanted forms of change' (Devine-Wright, 2009, p. 433). The opposite is true for people who rather feel alienated from that place (Devine-Wright, 2009, p. 434).

However, the extent of place identity and the belief that a development is a threat to it are not the only determinants of place protective behaviour. Individuals or groups must have a certain belief that they have a certain degree of influence on the outcome. Also, some socio-demographic characteristics play a role when it comes to activism. The next section of this chapter elaborates more on these socio-demographic variables and activistic behaviour.

2.2 Activism: collective action & environmental civic behaviour

2.2.1 General & climate change activism

> *'It is often taken for granted, at least where economic objectives are involved, that groups of individuals with common interests usually attempt to further those common interests. Groups of individuals with common interests are expected to act on behalf of their common interests as much as single individuals are often expected to act on behalf of their personal interests.' (Olson, 1971, p. 1)*

With these words Mancur Olson starts his book 'The logic of collective action'. These two sentences make up for the basic strain of thought for the concept of collective action. Collective action is the behaviour of a group of people, who act the same in order to get to a desired outcome (Olson, 1971). Activism is an example of collective action, especially when it comes to mass demonstrations; the more people take part in the demonstration, the bigger the statement is that a certain issue needs to be changed.

Finkel, Muller & Opp (1989) made a model to explain protest behaviour from a rational choice standpoint, since they noticed a gap in previous literature on explaining protest behaviour. They argued that it would be more logical for an individual to free ride, since attending a mass demonstration requires a lot of costs - like time and money - and the benefits - better climate policy for example - are not guaranteed (Finkel, Muller & Opp, 1989). With the addition of the concepts of personal influence and collective rationality to their model, they managed to predict participation in activism (Finkel, Muller & Opp, 1989). Personal influence refers to the individual belief that one's individual actions have a significant effect on group success (Finkel, Muller & Opp, 1989). Collective rationality refers to unity, the belief that the group can only succeed if the whole group attends the protest, and moral duty, which is the belief that if everybody free rides the group will definitely not succeed (Finkel, Muller & Opp, 1989).

Likewise, other scholars have built models that explain activism, but focussed specifically on climate change activism. For example, Roser-Renouf, Maibach, Leiserowitz & Zhao (2014) measured the effect of key beliefs about climate change or Lubbell (2002) focussed on the effect of demographic variables and perceived environmental threat. The key beliefs Roser-Renouf et. al. refer to, are the belief that climate change exists, the belief that climate change is a threat, the belief that climate change is caused by humans and the belief that humans can do something to combat climate change (2014). Interestingly, they found that people who only believe the first three key beliefs are far less likely to attend in climate change activism than people who believe in all four key beliefs; respectively 3 per cent versus 40 per cent of people attend in climate change activism.

Lubell found that young and high educated people tend to be more activist than older and less educated people. Besides that, people who are more educated on environmental issues and have a bigger network of people, which is also called social capital, are also more likely to attend climate change activism (2002). Mohai (1985) found that these people are more likely to do something about climate change. On the other hand, people of colour are less likely to take part in environmentalism. Income and gender do not have an influence on the extent of activism (Lubell, 2002, p. 445).

Besides these socio-demographic variables, Lubell also measured the effect of perceived environmental threat on environmental activism (2002). He found that people with high perceived environmental threat, are more likely to participate in climate change activism (Lubell, 2002, p. 441). Unfortunately, he did not clarify how he measured perceived environmental threat. However, the concept is, in some way, used by other scholars. For example, Baldassare & Katz build on the concept of environmental concern, which is a combination of environmental quality, perceptions of environmental problems, knowledge about environmental issues, and ecological interest and concern (1992, p. 603). They made the concept of environmental concern personal, by measuring if people felt threatened by these environmental problems themselves (Baldassare & Katz, 1992, p. 603). This leads to the understanding of perceived environmental threat as a concept that clarifies an individual's risk perception of environmental problems and how likely they think it is that environmental issues may impact their life and the lives of others.

Baldassare & Katz and Armstrong & Stedman specifically looked at the effect of respectively personal threat and environmental concern with local environmental problems. They both saw how these concepts were positively linked with environmental behaviour (Baldassare & Katz, 1992; Armstrong & Stedman, 2019). However, climate change is a global problem and local changes are not

easily identified as being caused by climate change. Therefore, it is interesting to look at the effect of perceived environmental threat which focuses more on climate change and how this is linked to climate change activism. Moreover, since climate change and the earthquakes in Groningen have a common cause, the fossil fuel industry, it is interesting to analyse how people in Groningen perceive climate change and if they are more likely to participate in climate change activism.

2.2.2 Environmental behaviour

Alisat & Riemer (2015) defined the concepts environmental behaviour and environmental civic behaviour before going into more detail on their framework on how to measure environmental civic behaviour. They used Stern's (2002) concepts of 'environmental significant behaviour' and 'environmental behaviour'. 'Environmental significant behaviour' is defined as practices that 'changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself' (Stern, 2002, p. 408). This type of behaviour can be direct, like installing solar panels, and also indirect, like raising awareness about environmental issues. The focus of environmental significant behaviour is on the environmental beneficial impact.

On the other hand, 'environmental behaviour' refers to 'behaviour that is undertaken with the intention to change (normally to benefit) the environment' (Stern, 2002, p. 408). Stern distinguished these two concepts, because for example, buying organic groceries is not per se beneficial to the environment when the groceries were heavily packaged and imported from a distant country. However, the person in this case bought these groceries because they had the intention to act in favour of the environment. This behaviour is interesting to analyse, since it is relevant to the 'understanding what individual and contextual factors drive people to engage in environmentally focused behaviours.' (Alisat & Riemer, 2015, p. 14), while 'environmental significant behaviour' is important when assessing the environmental impact of changing human behaviour. For this research, the term 'environmental behaviour' is therefore more relevant, since the driving forces of individuals to engage in environmental behaviour is more important than the actual impact of the behaviour.

However, this research is not focussing on all types of environmental behaviour. 'Behaviour' can refer to habits, communications and complex decisions. Alisat & Riemer argue 'environmental behaviour' can be divided into 'personal practice' and 'civic actions' (2015, p. 14). Personal practice is behaviour that refers to direct impact an individual intends to have on the environment. Buying organic groceries and installing solar panels are examples of personal practice. However, Roser-Renouf, Maibach, Leiserowitz and Zhao (2014) concluded that there are significant institutional and structural barriers for individuals to change their personal practices. Therefore, they argue, grassroot organizing and citizen activism is more efficient for reducing carbon gas emissions (Roser-Renouf et al, 2014. p. 163). Grassroot organizing and citizen activism is part of 'civic actions'. Alisat & Riemer (2015, p. 16) clarify that 'civic actions' refer to types of behaviour which involve engaged citizenship and activism. The goal of this type of behaviour is to indirectly impact the environment by influencing, most often, politics.

Dono, Webb and Richardson found empirical evidence that these types of behaviour differ much from personal practices, because civic action is determined by other predictors than personal practice (2010). Civic actions are less determined by individual characteristics like personal beliefs and attitudes, but contextual factors and social connections play a bigger role (Alisat & Riemer, 2015, p.

15). Therefore, it is interesting to analyse what drives people to become involved with civic actions, since this differs from personal practices.

In conclusion, the environmental behaviour that will be focused on in this research is environmental civic behaviour, and the focus of this research is on the contextual factors that influence behaviour instead of the actual environmental beneficial impact the behaviour creates.

2.2.3 Environmental civic behaviour & the environmental action scale

Finkel, Muller & Opp, Lubbell and Roser-Renouf et al. conceptualized activism in their own ways, which can be seen in table 1. While they all have useful concepts for this research, Alisat & Riemer (2015) developed the Environmental Action Scale, containing 18 indicators of environmental civic behaviour, which can be seen in table 2.

The scale is used for assessing engagement in environmental actions, which Alisat & Riemer created in order to evaluate the effect of programs that try to mobilize people to get into environmental civic behaviour.

The Environmental Action Scale was developed with the consultation of scientific literature, scholars and environmental activists. Several times, different items were tested on different test groups, varying in age, occupation and descent. This way, they made sure that the scale is valid for people from the global North as well as the South, varying in age and occupation status. After testing their scale on a group of students and on a group of well-known environmental activists, the Environmental Action Scale was finalized to 18 items, categorized by participatory actions and leadership actions, which are presented in table 2.

The scale is divided in participatory actions and leadership actions. Participatory actions are actions that 'are relatively uninvolved, simple behaviours that create almost no political pressure' (Alisat & Riemer, 2015, p.16). These actions are the actions most people start with when becoming engaged in environmental civic behaviour. Although many people never go beyond the level of participatory actions, some people take active leadership roles. Those people engage in leadership actions which require more skills and are more complex (Alisat & Riemer, 2015, p.16). Please notice that the scale represents a spectrum of behaviour, with the simplest action on the participatory side, ranging to more difficult actions which are leadership actions. The boundary between participatory- and leadership actions is 'fuzzy' and people tend to move back and forth on the spectrum. Unfortunately, Alisat & Riemer did not provide more clarification on what that spectrum exactly entails.

Table 2 Overview of indicators of activism, per scholar

Finkel, Muller & Opp (1989, p. 891) ***Legal protests***	**Lubell (2002, p. 439)**	**Roser-Renouf et. al. (2014, p. 168)**
- Signing a petition - Participating in a permitted demonstration - Wearing a sticker for a political cause - Working with a citizens group - Collecting signatures for a petition	- Joining an environmental group - Signing an environmental petition - Taking part in a protest about environmental issues in the past 5 years	- Contacting elected officials to support mitigation action - Attending climate related rallies or meetings - Donating or volunteering with an organization working to reduce global warming.

Table 2 Participatory and Leadership actions

Based on the Environmental Action Scale by Alisat & Riemer (2015)

Participatory actions	**Leadership actions**
- Got oneself informed about climate change - Participated in an educational event about climate change - Talked with others about climate change - Used online tools to raise awareness about climate change - Became involved with an environmental group or political party - Financially supported an environmental cause - Consciously made time to be able to work on environmental issues - Participated in a community event which focused on awareness on climate change - Participated in nature conservation efforts (e.g. planting trees) - Spent time working with a group/organization that deals with the connection of the environment to other societal issues such as justice or poverty	- Organized an educational event related to climate change - Used traditional methods (e.g. writing an article for a newspaper) to raise awareness about climate change - Personally contacted a politician/government official about climate change - Took part in a protest/rally about climate change - Organized an environmental protest/rally - Organized a boycott against a company engaging in causing climate change - Organized a petition related to combatting climate change - Organized a community event which focused on environmental awareness

3. Research Questions & Conceptual Model

3.1 Research gap

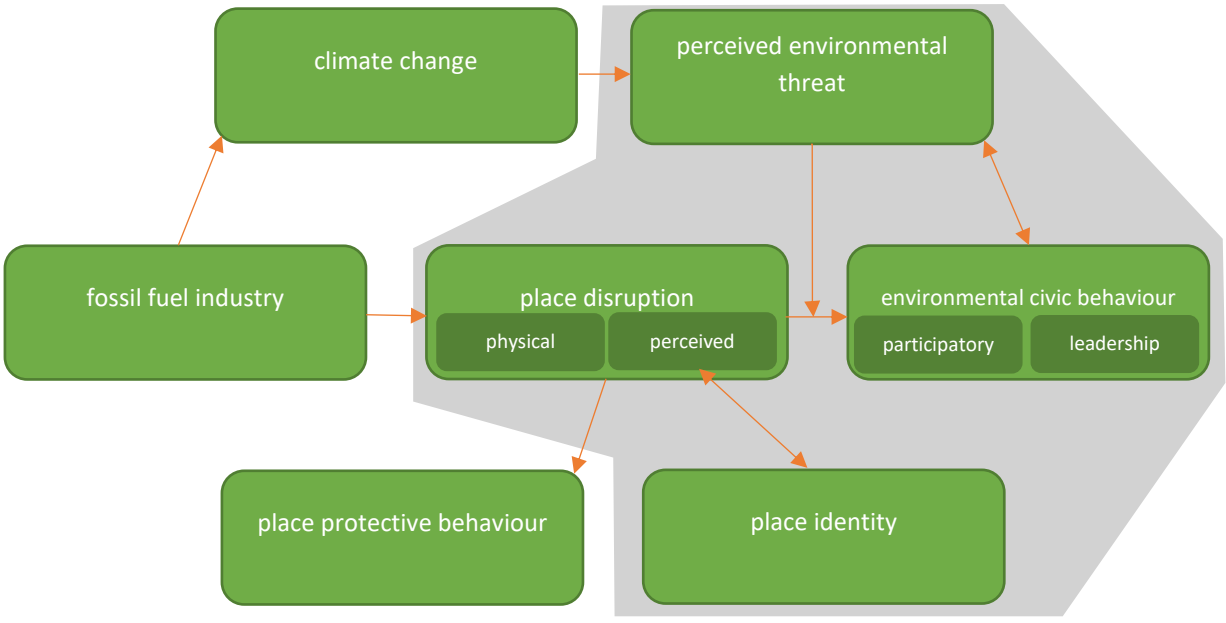
In figure 2, a conceptualisation of the relevant concepts for this research is shown. It shows how the focus of this research fills in a gap by linking two different phenomena. First, an over simplified conceptualisation of place protective behaviour as a result of place disruption is shown. The place disruption has, in this research, the same cause as climate change: the fossil fuel industry. On the one hand, the fossil fuel industry causes climate change and on the other hand it causes earthquakes ergo place disruption.

The earthquakes have resulted in citizens expressing place protective behaviour. Climate change, on the other hand, causes people to perceive environmental threat and respond by attending in environmental civic behaviour. These are very brief conceptualisations of these processes, as many other concepts are relevant to these phenomena, such as social capital (Lubell, 2002) and some key beliefs in climate change (Roser-Renouf, Maibach, Leiserowitz & Zhao, 2014). However, these phenomena are not the focus of this research. These phenomena are only portrayed in figure 2 since it makes clear how this research is related to these phenomena and how this research helps filling in this research gap.

This research is focused on how climate change activism and place disruption may be linked, especially since, in this research, these two concepts have a same cause: the fossil fuel industry. Similar shared causes of certain place disruptions and other societal negative effects are thinkable, like with airports which cause noise pollution and contribute to climate change. However, this research focusses on the specific case of the gas drillings in Groningen with both local and global negative effects.

Figure 2 Conceptual presentation of research gap

The concepts and correlations which fall completely on the grey background show the relevant concepts and relations for this thesis



3.2 Research questions and hypotheses

The aim of this research is to extend the knowledge on place disruption and its societal impact. By researching the possibility of a correlation between place disruption in Groningen and climate change activism, this thesis in contributing to the literature on place disruption and looks specifically into whether victims of place disruption behave more activist on related issues. This is tried to achieve by answering the following main research question:

To what extent is environmental civic behaviour influenced by place disruption as experienced by the people who have lived in the Province of Groningen and do place identity and perceived environmental threat play a role in this?

In order to get this question answered, the following sub questions need to be answered:

1. In what way does place identity influence the perception of place disruption?
2. In what way does place disruption influence the engagement in environmental civic behaviour?
3. In what way does perceived environmental threat influence the engagement in environmental civic behaviour?
4. Is there a difference between respondents partaking in participatory and leadership actions and how can that difference be explained?

3.3 Concepts

In order to fill in the research gap, and answer the research questions of this thesis, it is necessary to define the used concepts. This section describes the definitions of the used concepts and elaborates on how they correlate to each other. In chapter 4 an overview of the indicators of these concepts is given, accompanied by the information on how these concepts were quantified.

Place identity

For this research, place identity refers to the personal place identification and social place identification of a place to a person. In this case, this means that it was measured to what extent the province of Groningen has become part of the identity of someone and to what extent someone feels like a 'Groninger'.

This research looked into if place identity correlates with perceived place disruption, because spatial change can unveil certain bonds between a person and a place that are otherwise latent (Brown & Perkins, 1992), and the way place disruption is perceived may depend on the extent to which someone identifies with that place.

Place disruption

Place disruption is chosen as the concept which indicated the extent to which the people from Groningen were affected by the earthquakes, both psychologically and physically. In this research, two sub variables were taken to measure this: physical place disruption and perceived place disruption.

Physical place disruption refers to disruptive events itself which were caused by the earthquakes in Groningen. Perceived place disruption refers to how people have experienced and perceived the place disruption. An example of this is the feeling of sadness due to the earthquakes in Groningen. The first sub variable refers to the physical aspects of the place disruption, while the second sub variable refers to the social effects of the place disruption.

Since this research looked into the effect of place disruption on environmental civic behaviour in the case that place disruption and climate change having a common cause, this research looked for a causal relation of place disruption to environmental civic behaviour.

Perceived environmental threat

Since Lubell (2002) found that perceived environmental threat was a crucial influence for environmental civic behaviour, this concept is chosen to indicate to what extent people perceive climate change as a risk, both for themselves and society. Unfortunately, Lubell did not specify what he meant by perceived environmental threat exactly. However, Baldassarre & Katz (1992) formulated a similar concept, building on the concept of environmental concern. Based on both Lubell and Baldassare & Katz, perceived environmental threat is defined as an individual's risk perception of environmental problems and how likely they think it is that environmental issues may impact their life and the lives of others.

Since perceived environmental threat is an important indicator of environmental civic behaviour, according to Lubell, the assumed correlation between place disruption and environmental civic behaviour is possibly influenced by perceived environmental threat: someone who does not perceive climate change as a threat is probably less likely to attend in environmental civic behaviour, in contrast to someone who perceives climate change as a threat. In order to measure the influence of place disruption on environmental civic behaviour, the perception of climate change as a threat needs to be measured as well. This way, perceived environmental threat influences the correlation between place disruption and environmental civic behaviour.

This study also inquired the assumed correlation between perceived environmental threat and environmental civic behaviour. Because, regardless of place disruption, the risk perception of climate change probably has an effect on someone's environmental civic behaviour. Environmental civic behaviour probably has an effect too on perceived environmental threat, because if someone participates more in environmental civic behaviour, this will probably influence someone's risk perception of climate change, especially because part of environmental civic behaviour is informing oneself on environmental issues.

Environmental civic behaviour

Environmental civic behaviour refers to the actions people carry out if they want to influence others, mostly politicians and other people in power, and by doing that indirectly impact the environment for the better. Luckily, Alisat & Riemer (2015) provided a framework which was used to measure environmental civic behaviour: the Environmental Action Scale. Although they created this framework to measure the impact that certain programs have on mobilizing people, it is also a helpful framework to compare the extent to which groups engage in environmental civic behaviour. Environmental civic

behaviour contains two types of behaviour, participatory and leadership actions, which is a spectrum ranging from low effort participatory actions to leadership actions which require a lot of skills (Alisat & Riemer, 2015).

Environmental civic behaviour is the outcome variable in this research, and the key to this research is to find out the influence of place disruption on environmental civic behaviour in the case that both place disruption and climate change have a common cause. This hypothesised correlation is probably shaped by the perception that climate change is a threat.

3.4 HYPOTHESES

The sub questions and main question were answered by testing five hypotheses. In summary, each hypothesis tests a relation between two concepts as shown in the conceptual model (figure 3), and there is also a hypothesis to test the difference between the people from Groningen and the people who have never lived in the province of Groningen.

The first hypothesis is focussed on place identity and perceived place disruption, which is a sub variable of place disruption. This research looked into the correlation between place identity and perceived place disruption and researched if these concepts positively correlate with each other. Therefore, the first hypothesis in this research goes as follows: *Place identity has a positive correlation with perceived place disruption.*

The second hypothesis tests if there is a positive correlation between input variable place disruption and outcome variable environmental civic behaviour, since the assumption of this research is that place disruption has a positive effect on environmental civic behaviour, since the earthquakes and climate change have a joint cause. Therefore, the second hypothesis goes as follows: *Place disruption has a positive correlation with environmental civic behaviour.*

The third hypothesis inquires the relationship between perceived environmental threat and environmental civic behaviour. The literature suggests that perceived environmental threat correlates positively with environmental civic behaviour; the more people perceive climate change as a threat, the more likely they are to participate in environmental civic behaviour. This correlation goes two ways, because some indicators of environmental civic behaviour are about the extent someone puts effort in getting informed about certain environmental issues. The third hypothesis of this research is as follows: *Perceived environmental threat has a positive correlation with environmental civic behaviour.*

The fourth hypothesis looks into the effect of perceived environmental threat on the correlation between place disruption and environmental civic behaviour. This research wants to detect whether perceived environmental threat has a positive effect on the relation of place disruption to environmental civic behaviour. Since hypotheses 2 and 3 test that place disruption and perceived environmental threat both have a positive effect on environmental civic behaviour, it is expected that perceived environmental threat has a positive effect on the correlation between place disruption and environmental civic behaviour. Therefore, the fourth hypothesis of this research goes as follows: *Perceived environmental threat has a positive effect on the relation between place disruption and environmental civic behaviour.*

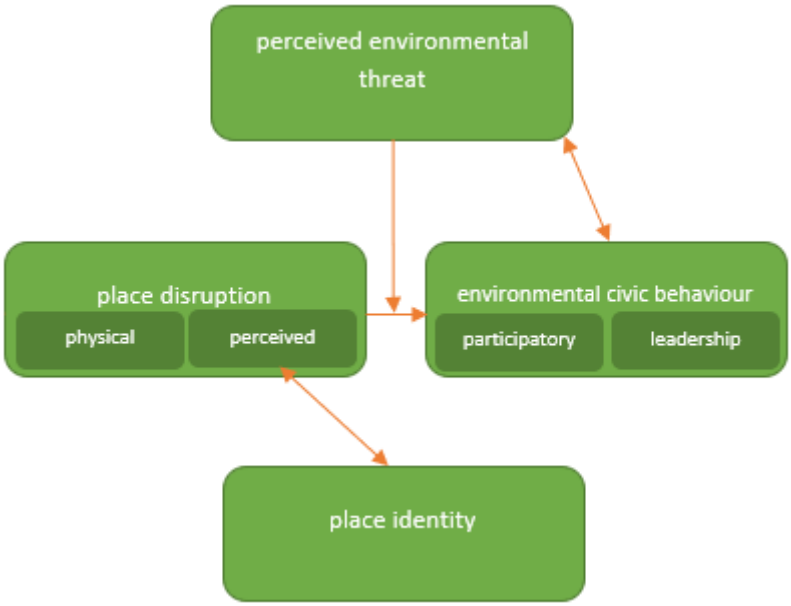
The last hypothesis compares the people who have experienced place disruption to people who have not and looks into the difference in outcome variable environmental civic behaviour. Since hypothesis 2 assumes a positive effect of place disruption on environmental civic behaviour, this hypothesis tests if the people who have experienced place disruption score higher on environmental civic behaviour. Therefore, the fifth hypothesis goes as follows: *The people who have experienced place disruption participate more in environmental civic behaviour.*

Table 3 shows how the sub questions and hypotheses correspond to each other in order to answer the main research question. Figure 3 shows the conceptual model of this research.

Table 3 Overview of (sub) questions and hypotheses

main research question	sub questions	hypotheses
To what extent is environmental civic behaviour influenced by place disruption as experienced by the people who lived in the Province of Groningen and do place identity and perceived environmental threat play a role in this?	1. In what way does place identity influence the perception of place disruption?	H1 = Place identity has a positive correlation with perceived place disruption.
	2. In what way does place disruption influence the engagement in environmental civic behaviour?	H2 = Place disruption has a positive correlation with environmental civic behaviour.
	3. In what way does perceived environmental threat influence the engagement in environmental civic behaviour?	H3 = Perceived environmental threat has a positive correlation with environmental civic behaviour. H4 = Perceived environmental threat has a positive effect on the relation between place disruption and environmental civic behaviour.
	4. Is there a difference between respondents partaking in participatory and leadership actions and how can that difference be explained?	Mainly H5 = The people who have experienced place disruption participate more in environmental civic behaviour. Secondarily: H1, H2, H3 & H4

Figure 3 Conceptual model



4. METHODOLOGY

This chapter describes the methodological choices made for this research. First, a description of the research strategy will be given. Second, methodological choices for the data collection and analyses will be described. In this section, the operationalisation of the used concepts will also be provided. Last, the validity and reliability of this research will be pointed out.

4.1 RESEARCH STRATEGY

4.1.1 RESEARCH PHILOSOPHY

Every scientific research starts with certain research beliefs regarding the ontology, epistemology, and the methodology of the research, also known as the research philosophy (Guba & Lincoln, 1994). The ontology of the research clarifies what can be perceived as reality. Epistemology can be seen as the study of knowledge and answers the question on what the value of knowledge is. The methodology refers to the process and procedures of the research in order to find answers to the main questions. These dimensions of research are guided by a research paradigm. A research paradigm is "a set of interrelated assumptions about the social world which provides a philosophical and conceptual framework for the organized study of that world" (Filstead, 1979, p.34).

This research is conducted with a positivist research paradigm in mind. Positivism views reality as one true reality which is objectively observable (Guba & Lincoln, 1994; Saunders, Lewis & Thornhill, 2012). This research tests if the theoretical concepts and their assumed relations to each other really exist; if they are empirically findable. In this research, the effect of place disruption to environmental civic behaviour, specifically when both place disruption and the subject of environmental civic behaviour, climate change, have a common cause, is at the centre of its inquiry. To make sure that the phenomenon could be investigated objectively, and the study is relatively value free, the researcher had to distance herself to the research object (Guba & Lincoln, 1994; Saunders, Lewis & Thornhill, 2012). That way, the researcher was able to make clear distinctions between objective reasoning and subjectivity.

4.1.2 RESEARCH APPROACH

Since this study has tried to find out if people who experience or perceive place disruption engage more in environmental civic behaviour, specifically when both place disruption and the subject of environmental civic behaviour, climate change, have a common cause, a comparison had to be made between different groups of people. People who have experienced place disruption were compared to people who did not experience place disruption. In The Netherlands, the case of Groningen is an example of a place where people have experienced place disruption, because of the earthquakes due to the gas drillings in that area. 'Groningen' is therefore the case where this study is focussing on, and it is used as an indication if place disruption and environmental civic behaviour correlate with each other, especially in the case that the disruption and the subject of the environmental civic behaviour, climate change, have a common cause. To see if place disruption does influence environmental civic behaviour, 'Groningen' needs to be compared to a group of people who did not experience any substantial place disruption. That group of people functions as the control group in this study. The

group from Groningen, from now on, is called the research group and the group of people who have never lived in Groningen is called the control group.

Positivist studies have generally observable and quantifiable findings (Saunders, Lewis & Thornhill, 2012). This makes that a quantitative research design was the best fit to this study that tests multiple hypotheses. Therefore, this study used a comparable survey for both research groups. The main benefit of doing a survey, is that the findings are more generalizable than with qualitative studies, since the research population is bigger. The downside to this is that this study has to compromise on an in-depth investigation on these correlations (Verschuren & Doorewaard, 2007). Since this study serves as an indicative study on correlations between theoretical concepts, it made sense to not investigate the assumed correlations in an in-depth way.

4.2 Research Methods

4.2.1 Data Collection

For this study, a random sample was needed to investigate if there is a correlation between place disruption and environmental civic behaviour. This is important, because all potential research objects, all potential respondents to the survey, in the population must have had an equal opportunity to be part of the sample (Verschuren & Doorewaard, 2007).

On the other hand, the survey had to be distributed amongst a large group of people in order to have somewhat generalisable outcomes and a large research population was needed for most statistical tests. Therefore, the survey was distributed amongst the members of DeGoedeZaak who were interested in climate change, which where 14.000 people. Besides that, the survey was hosted on a website specially made for this survey, in order to distribute the survey easily via social media. The personal social media pages from the researcher herself were used, and some action groups on climate change and/ or the gas drillings in Groningen, like Het Groninger Gasberaad, shared the survey as well via their social media platforms. Because the number of respondents from Groningen was low during the first week of conducting the survey, some people who were active on Twitter on the subject of the gas drillings in Groningen were asked to share the survey on their Twitter pages as well. Liesbeth van Tongeren, councillor of the GroenLinks party in The Hague and former member of the Second Chamber, Sandra Beckerman, member of the Second Chamber for the Socialist Party, and Annemarie Heite, who made a documentary about the consequences of the gas drillings, shared the survey on their Twitter feeds.

Since the survey was distributed via social media and DeGoedeZaak, Mrs. Van Tongeren, Mrs. Beckerman, Mrs. Heite and action groups, the survey was distributed amongst a large group of people who in general are more progressive and their political orientation was more left-wing compared to the rest of The Netherlands. Besides that, the number of young people, especially within the control group, which filled out the survey was very high. Therefore, more effort was put into reaching other age groups. The survey was sent to a group of people who attend ‘yoga and sports for elderly’ outside of Groningen.

During the time that the survey was open, which was sixteen days (from the 14th to the 30th of June 2019), the group of people that had experienced physical place disruption in Groningen was quite low. Therefore, 36 surveys were conducted in person in two of the most affected areas by the

earthquakes in Groningen: Loppersum and Appingedam. Because there was some time left at the end of the day, 14 surveys were conducted in person in the city of Groningen as well. Conducting surveys in person is different than letting people fill out online surveys, because there is some interaction with the researcher. Although the researcher did her best to interact as minimally as possible, for instance by not providing any clarification with any of the survey questions, people can feel judged by the researcher and therefore fill in the survey differently than they would have done if they would have filled out the survey online. And the researcher had to ask people to fill out the survey in person, which may have caused that people who otherwise would not fill out the survey, now filled out the survey. However, since it is important for this research to inquire information from people of affected areas, this intervention in conducting surveys was required.

Considering these interventions, the researcher had to make a large group of people fill out the survey, the data sample is not 100% random. Besides that, more progressive and young people have filled out the survey, which will be discussed in section 4.2.3. Although the data sample used in this study is not 100% random, it is random enough to use for scientific research, especially when a correction is made for the differences between socio-demographic variables (see section 4.2.3). Besides that, partly due to these interventions the number of respondents was 679, which is a large enough sample size to do scientific statistical research on.

4.2.2 Survey

This section describes the survey which was used to conduct the data used for this research. In table 4 the indicators for each variable is presented. The survey is added to this thesis in appendix A. The exact way of measuring these variables is elaborated upon in section 4.2.3.

The first question of the survey was about people's belief in human caused climate change. The 31 people who did not believe this, were filtered out of the sample. After that, the people who answered that they are living in or have lived in the province of Groningen got different questions than the people who answered that they did not live in Groningen.

The people from Groningen had to fill out three questions about place identity. This group also had to indicate if any physical place disruption caused by the earthquakes in Groningen had taken place into their lives. Thereafter, this group had to specify in four questions to what extent they perceived place disruption and how it affected their wellbeing.

The group who did not live Groningen also had to make clear if they have had experience with any substantial physical place disruption. The eight people who did experience substantial physical place disruption and did not live in the province of Groningen were selected out of the sample, because this would have made it unclear to what extent these experiences would have affected their environmental civic behaviour. In order to see the effect of the physical place disruption in Groningen, the physical place disruption which is researched in this study had to be focussed on the case of Groningen.

After this, both groups got the same questions again. There were eleven questions about perceived environmental threat. For the first two questions of this part, the respondents had to specify to what extent they worry about climate change. The next nine questions, the respondents had to

indicate how likely they thought some events caused by climate change would take place in the next fifty years.

The next set of questions was about environmental civic behaviour. The people had to clarify how often in the six months prior to filling out the survey they had engaged in specific environmental civic behaviour practices.

The survey was concluded with a set of questions about the socio-demographic status of the respondent. In total there were 32 questions in the survey, including a question if the respondent agrees with and understood the purpose of this survey, and an open question where the respondent could leave any further questions or remarks on the survey (See Appendices A and B).

4.2.3 Operationalisation

In table 4, the used variables and their indicator questions are shown. In this section, an elaboration is given on the way the variables were measured and used for the data analysis. First, each variable will be discussed, and if necessary, transformations will be elaborated upon. Next, the internal consistency of the variables is presented with the use of Cronbach's Alpha.

Place identity

Place identity is an external variable, which correlates with a sub variable of place disruption, which is perceived place disruption. Place identity refers to the extent to which someone identifies with the province of Groningen (for example: 'The province of Groningen is part of my identity'). The average score over three indicator questions is taken as the score for place identity, which was measured on a five-point Likert scale.

Place disruption

Place disruption consists of two sub variables: physical place disruption and perceived place disruption. Physical place disruption refers to disruptive events itself which were caused by the earthquakes in Groningen. Three disruptive situations were presented in the survey, like devaluation of ones occupied home due to the earth quakes in Groningen. The score for physical place disruption ranges from zero to one, with each event contributing 0.333. Perceived place disruption refers to how people have experienced and perceived the place disruption. An example of this is the feeling of sadness due to the earthquakes in Groningen. Three five-point Likert scale questions were asked and the average was taken and rescaled to a scale from 0 to 1. This sub variable was rescaled, in order to match it to physical place disruption.

Both perceived and physical place disruption contribute 50% of the total score for place disruption, which scores range from zero to one as well. Measuring the main variable this way, both sub variables are equally important. The downside to this is that people who don't live in Groningen anymore or just have not experienced these disruptive events, were not able to get a higher score

Table 4 Overview of concepts and indicators

Concept	Indicators	Measurement	Cronbach's Alpha	Used for
Place identity	'I identify myself as a Groninger' 'The province of Groningen has become part of me' 'Whenever someone asks where I come from, I always mention that I live(d) in Groningen'	5-point Likert scale 1. disagree 2. partly disagreed 3. neutral 4. partly agree 5. agree	0.794	Sub question: 1 Hypotheses: 1
Place disruption: physical place disruption	'The residence which I bought in Groningen has fallen in value due to the earthquakes in Groningen' 'My residence (bought or rented) has been damaged by the earthquakes in Groningen' 'I live(d) in the earthquake zone in Groningen'	0.333 for each disruption	0.852	Sub question: 2 Hypotheses: 2, 4 & 5
Place disruption: perceived place disruption	'The earthquakes in Groningen feel like a dent in my identity' 'I have psychological complaints, such as stress, suppression or insomnia, due to the earthquakes in Groningen' 'I am saddened by the earthquakes in Groningen' 'The earthquakes in Groningen do not interest me' *(inverted)*	5-point Likert scale 1. disagree 2. partly disagreed 3. neutral 4. partly agree 5. agree	0.705	Sub question: 1 & 2 Hypotheses: 1, 2, 4 & 5
Perceived environmental threat	'I am afraid of the effects of climate change that affect my own life' 'I am concerned about the effects of climate change that do not have a direct effect on my own life' Indicate to which extent you expect the following matters to happen in the coming 50 years: • A substantial part of the Netherlands is flooded • Climate change causes an increase in food shortages and hunger in the world • Hunger and food shortages occur in the Netherlands due to climate change • Climate change causes a disease epidemic • You suffer from the disease caused by climate change • Your quality of life is deteriorating due to climate change and its consequences	For the first 2 questions: 5-point Likert scale: 1. disagree 2. partly disagreed 3. neutral 4. partly agree 5. agree For the 9 climate change events: 5-point Likert scale: 1. very unlikely 2. somewhat unlikely	0.862	Sub question: 3 Hypotheses: 3, 4 & 5

	• The quality of life of the average Dutch person is deteriorating due to climate change • The quality of life of the average Earth inhabitant (human and animals) is deteriorating due to climate change • Richer countries must offer major financial support to poorer countries due to climate change	3. neutral 4. somewhat likely 5. very likely		
Environmental civic behavior: participatory actions	In the past 6 months, with what frequency did you participate in the following matters? • Getting oneself informed about climate change • Participated in an educational event about climate change • Talked with others about climate change • Used online tools to raise awareness about climate change • Became involved with an environmental group or political party • Financially supported an environmental cause • Consciously made time to be able to work on environmental issues • Participated in a community event which focused on awareness on climate change • Participated in nature conservation efforts (e.g., planting trees) • Spent time working with a group/organization that deals with the connection of the environment to other societal issues such as justice or poverty	5-point Likert scale 1. Never 2. Rarely 3. Sometimes 4. Often 5. Very often	0.893	Sub question: 2, 3 & 4 Hypotheses: 2, 3, 4 & 5
Environmental civic behavior: leadership actions	In the past 6 months, with what frequency did you participate in the following matters? • Organized an educational event related to climate change • Used traditional methods (e.g., writing an article for a newspaper) to raise awareness about climate change • Personally contacted a politician/government official about climate change • Took part in a protest/rally about climate change • Organized an environmental protest/rally • Organized a boycott against a company engaging in causing climate change • Organized a petition related to combatting climate change • Organized a community event which focused on environmental awareness	5-point Likert scale 1. Never 2. Rarely 3. Sometimes 4. Often 5. Very often	0.800	Sub question: 2, 3 & 4 Hypotheses: 2, 3, 4 & 5

than 50% for place disruption. However, the literature mainly focusses on the perception of place disruption and not on the experience of the place disruption itself. On the contrary, the actual experience of those disruptive events could be quite traumatic. Therefore, the analysis on place disruption will also be executed with both sub variables separately.

PERCEIVED ENVIRONMENTAL THREAT

Perceived environmental threat is the belief someone has on how likely it is that climate change causes certain events in the next coming 50 years. In this survey, ten different events were chosen as indicators of this variable. Besides that, two more general questions about climate change and the extent to which people worry about it were asked. All indicator questions were asked on a five-point Likert scale and the average score was taken as a final score for perceived environmental threat.

ENVIRONMENTAL CIVIC BEHAVIOUR

The 18 indicators from the Environmental Action Scale, as shown in table 2, were taken as indicators for environmental civic behaviour, with ten indicators for sub variable participatory actions and eight indicators for leadership actions. Since Alisat & Riemer, the scholars who created the Environmental Action Scale, did not provide instructions on how to quantify the scores for environmental civic behaviour using this scale, a few decisions had to be made in order to do this.

First, the decision was made to also do the analysis on the sub variables participatory actions and leadership actions separately. This makes possible changes in the influence of independent variables clear on both sub variables, which is needed to answer sub question four.

All indicators were measured on a five-point Likert scale. The mean score of the 10 indicators for participatory actions was taken to indicate the extent to which people were engaged in participatory actions, in the six months period prior to filling out the survey (roughly January to July in 2019).

For leadership actions, a transformation had to made, since both nonparametrical and parametrical tests were used to test the hypotheses of this study, and the untransformed data of leadership actions was violating the assumptions of the parametrical tests. For the nonparametrical tests, the sub variable was used untransformed. For the parametrical tests, 'leadership actions' was transformed into a dichotomous variable. In section 4.2.** the used tests will be explained.

Because 51.8% of the respondents did not partake in any leadership action at all in the same six months prior to filling out the survey, and the remaining respondents mostly scored quite low on leadership actions, leadership actions was transformed into a dichotomous variable; 'no leadership actions at all' for people who scored exactly 1 on the five-point Likert scale, and 'at least some leadership actions' for the people who scored higher than 1 on the same scale.

48.2% of the participants did take part in leadership actions, but most of the participants indicated that they only 'rarely' took part in some of the leadership actions. Only 7.4% of the participants answered 'sometimes', 'often' or 'very often' as the frequency that they took part in leadership actions in that period. This nuance is lost by making the variable a dichotomous variable.

However, considering the feasibility of this research and the small group size of people who regularly attended in leadership actions, this loss is justified. Besides that, 'leadership actions' was untransformed for the nonparametrical tests, therefore, still some nuance in leadership actions was remained in this study.

Because leadership is transformed into a dichotomous variable, the final score for environmental civic behaviour was measured by doing the tests on two groups; one group without any leadership actions, and the other group with at least some leadership actions. By doing the tests twice, it was made visible if the independent variables influenced participatory actions differently on the people who did participate in leadership actions.

SOCIO-DEMOGRAPHIC VARIABLES

Socio-demographic characteristics are included because they have an effect on environmental civic behaviour, simply because, for example, people who have fulltime jobs have less time to engage in environmental civic behaviour than people who do not have jobs. Besides that, Lubell (2002) found that young and high educated people tend to engage in activism more. Socio-demographic variables are being used in this research to make sure that the research groups are comparable to each other. In section 4.2.** more details on this are provided. The socio demographic characteristics in this research are:

- Age: derived from the year of birth
- Gender: Male, female or other
- Educational level: No or incomplete elementary school, elementary school, secondary school, Intermediate vocational (MBO), Bachelor (hbo/university), Master (hbo/university), PHD or higher.
- Occupational status: Unemployed, not working or working less due to a disability, taking care of the family, working part-time, working fulltime, being a fulltime student, being a part-time student. Respondents were able to answer on multiple options (see appendix *.
- Political orientation: Left, right, progressive, conservative, liberal, socialist, communist, nationalist. Since the survey of this research was sent to members of DeGoedeZaak, which are generally progressive and idealistic people, and distributed via some politicians via social media, it is important to control for political orientation. This is discussed more in section 4.2.**. Respondents were able to answer on multiple options (see appendix *).

CRONBACH'S ALPHA TEST FOR INTERNAL CONSISTENCY

In order to measure respondents' place identity, place disruption, perceived environmental threat and environmental civic behaviour, multiple questions were asked in the survey for each concept. The following section provides information on the Cronbach's Alpha test.

For perceived place disruption, four questions were asked. One of those questions was formulated negatively, namely: 'I do not care about the earthquakes in Groningen'. The answer on this item was inverted in order to add them to the answers on the other three questions.

For all concepts, in order to estimate the generalizability of these sets of items, the Cronbach's Alpha was used. The Cronbach's Alpha tests the internal consistency of multiple items (Cronbach,

1951; Tavakol & Dennick, 2011). The Cronbach's Alpha coefficient can have a value between 0 and 1; the closer the coefficient is to 1, the higher the internal consistency of the observed items is and the more reliable the construct is (Hair, Black, Babin & Anderson, 2014; Gilbert & Churchill, 1979). 0.7 is seen as the threshold for acceptable internal consistency. However, values below .7 can still be usable for statistical research, but a notion about the internal consistency has to be made. In table 4 the Cronbach's Alpha coefficients are shown for each variable. As the lowest coefficient is 0.705, each set of items is consistent and reliable.

4.2.4 DATA SELECTION & RESEARCH GROUPS

This section discloses which data was used for the statistical tests, which will be described in section 4.2.4. This section also discusses the representability, generalizability and comparability of the research groups to each other and the whole population.

DATA SELECTION

In total, 679 people filled out the survey. 31 people filled out that they disagreed or somewhat disagreed with the premise that climate change is partly caused by humans. These people were excluded from the dataset, as well as the eight people who did not live in the province of Groningen and had experienced other significant physical place disruption.

79 of the remaining respondents did not fill out the socio-demographic questions completely. Because these socio-demographic variables are important in order to make a good comparison between the two research groups, these 79 respondents were also excluded from the data sample.

In the data sample, there are still some missing values, due to technical errors from Qualtrics – the program which was used to conduct the surveys - or some people who filled out the survey on paper forgot to fill out a specific question. The respondents with some missing values were still included in the sample. However, the statistical analyses exclude these cases if the relevant variable was missing. Therefore, the population size, n, is portrayed with each result table.

In total 560 respondents were part of the relevant data sample. 290 respondents were part of the main research group and 271 people were part of the control group.

RESEARCH GROUPS

This research is looking at the differences in environmental civic behaviour between the people from Groningen, the main research group, and the people from somewhere else in The Netherlands, the control group.

There is a third group in this research, namely the respondents who have lived in the province of Groningen and do not live there anymore. These respondents were asked the same questions as the Groninger people. The main difference between these respondents and the respondents who currently live in Groningen, is that they did not experience any physical place disruption. However, they still identify to some extent to the province of Groningen. Therefore, the variable place identity was also measured within this group. Therefore, these 46 respondents were included in the research.

In table 5, the socio-demographic variables of each research group are displayed. This group is analysed separately for the first hypothesis, which looks into more detail on place identity and perceived place disruption. For the rest of the research, this group of people was analysed within the main research group – the respondents who come from the province of Groningen.

REPRESENTABILITY, GENERALIZABILITY & COMPARABILITY

After excluding the 31 respondents who did not believe in human caused climate change, the 8 respondents who have experienced significant physical place disruption outside of Groningen, and the 71 people who did not fill out the socio-demographic questions, the data sample consisted of 560 people. The socio-demographic characteristics of the data sample are given in table 5. In the same table, an overview of the socio-demographic variables of the Dutch population is given.

The respondents of this survey are not a good representation of the Dutch population. As a start, the distribution of 'age' is skewed. For the research group, there are a lot of people aged between 50 to 64 and very few aged between 65 to 79. For the control group, there are a lot of people aged between 18 to 34 and very few between 35 to 49 years old. In the next section, the correction for the age difference between the groups will be explained. However, since this research focusses on the difference between the two research groups, the correction is only been made to make the groups comparable to each other. This means that the outcome of this research still will not be generalizable to the full population of the Netherlands.

Gender is equally distributed amongst the research group. However, amongst the control group, more women have filled out the survey. Although environmental activism is not influenced by gender according to Lubell (2002, p. 445), it is unclear in what way gender does affect the other relevant variables in this research. Therefore, this discrepancy has to be kept in mind when analysing the research findings.

The Dutch statistics on education are measured differently than this research did, which makes it harder to analyse whether the research population is representative for the Dutch population. However, since 33% of the Dutch population has a diploma in higher education, compared to 67.1% for the research group and 73.3% of the respondents from the control research group, it is clear that the respondents of this survey are higher educated than the general Dutch public. This has to be kept in mind when looking at the research findings, especially since higher educated people tend to engage more in environmental activism (Lubell, 2002, p. 445). However, the difference between the research groups is not too big and therefore, the groups are comparable to each other on education level.

For occupational status, the data sample differs with the statistics on the Dutch population for unemployed people and students. For unemployed people, the literature was unclear whether it has impact on any of the relevant variables. However, for students, the literature indicated that young and high educated people tend to engage more in environmental activism (Lubell, 2002, p. 445). Besides that, the research group has a bigger percentage of people having a full-time job, and there is a bigger part of full-time students within the control group. The difference between the groups is not so big that a correction must be made in the data sample. However, when analysing the data, this difference between the research groups has to be kept in mind.

Table 5 Socio-demographic variables of research group and control group

Plus an overview of the sodio-demographic variables of the people who used to live in Groningen

		Groninger Group		Old Groninger group		Control group		Dutch population
Age[1]	*19-34*	49	21,9%	11	18,9%	119	43,9%	25.3%
	35-49	44	19,6%	20	30,8%	30	11,1%	24.7%
	50-64	100	44,6%	23	35,4%	42	35,3%	28.7%
	65-79	31	13,8%	11	16,9%	80	29,5%	20.4%
Gender[2]	*Female*	111	49,6%	25	38,5%	150	55,4%	49.6%
	Male	112	50,0%	39	60,0%	119	43,9%	48.5%
	Won't say/ other	1	0,4%	1	1,5%	2	0,7%	1.8%
Education[3]	*No/ incomplete*	1	0,4%	0	0,0%	0	0,0%	28.3%
	Elementary school	2	0,9%	1	1,5%	2	0,7%	
	Secondary school	34	15,2%	1	1,5%	30	11,1%	
	MBO	31	13,8%	6	9,2%	28	10,3%	38.7%
	Bachelor	81	36,2%	24	36,9%	103	38,0%	
	Master	63	28,1%	27	41,5%	87	32,1%	
	PHD or higher	7	3,1%	5	7.7%	7	2,6%	33.0%
	Won't say/other	5	2,2%	1	1.5%	14	5,2%	
Occupation[4 5]	*Unemployed*	23	10,3%	4	6.2%	25	9,2%	24.5%
	Part time student	4	1,8%	2	3.1%	7	2,6%	-
	Full time student	30	13,4%	5	7.7%	53	19,6%	4.3%
	Part time job	58	25,9%	15	23.1%	68	25,1%	25.5%
	Full time job	91	40,6%	33	50.8%	72	26,6%	26.0%
	Retired	33	14,7%	8	12.3%	58	21,4%	18.5%
	Won't say/ other	3	1,3%	1	1.5%	15	5,5%	1.7%
Political orientation[6 7]	*Left wing*	116	51,2%	36	55.4%	169	62,4%	28.0%
	Right wing	13	5,8%	4	6.2%	14	5,2%	49.3%
	Progressive	74	33,0%	28	43.1%	141	52,0%	-
	Conservative	14	6,3%	0	0.0%	6	2,2%	-
	Liberal	34	15,2%	10	15.4%	41	15,1%	-
	Socialist	60	26,8%	19	29.2%	81	29,9%	-
	Won't say/ other	37	16,5%	13	20.0%	34	12,5%	-
Size of group		224		65		271		17.3 million

[1] The percentages on age for the Dutch population is derived from statistics on the Dutch electorate in 2019

[2] The percentage for the Dutch population regarding gender is based on statistics from the Central Bureau for Statistics (CBS) from 2019. The category 'won't say/other' is based on missing data, since the CBS did not have a third gender category.

[3] The CBS only has data on low (no education, elementary schooling, the lower three years of secondary school and MBO 1), middle (the upper years of the secondary school, MBO 2, 3 and 4) and higher (bachelor, master, PhD and higher) education. Therefore, the percentages on education for the Dutch population is given in only these three categories.

[4] Since there are no data on occupational status of the Dutch population, several data are used to come up with the statistics given in the last column of this table. The Dutch labour force consists of people between 15 and 75 years old, which consists of 9.2 million people. There are no accurate data on how many people attend part time schooling. In this table, unemployed is seen as people who do not have a job and are not a student or retired. The data on the number of students and retired people is based on 2018.

[5] The people who filled out that they were only a volunteer or were only taking care of the family were added to the 'unemployed' category.

[6] Based on their distribution of seats in the House of Representatives. Political parties PvdA, SP, GroenLinks and PvdD are seen as left-wing, whereas political parties CDA, VVD, PVV and FvD are seen as right- wing. D66, SGP, DENK, CU and 50+ are centrist.

[7] There was the option to add one's own political ideology. A few people added 'centrist' or 'environmentalist'. Al though these ideologies could have been good options to use in the survey, they were not included as such in the analyses, since it is uncertain how many of the respondents would have filled out these options if they were added to the survey beforehand. The options 'nationalist' and 'communist' were filled out so little that these options were added to the 'won't say/ other' category.

As for political orientation, the data sample is more left-wing than the Dutch population, when taking the Dutch House of Representatives as a reference point. Also for that reason, the data sample is not an accurate representation of the Dutch population. The control group is 11.3 percent point more left-wing than the research group, which has to be kept in mind when looking at the research findings. The literature does not claim a direct correlation between certain political ideologies and the relevant variables of this study. However, it is worth mentioning that the literature on the influence of political orientation on environmental civic behaviour is more focused on the United States and its political system, than on the Dutch political system, which differ quite a lot. Therefore, the difference in political orientation between the research groups had to be kept in mind when analysing and interpreting the data.

In sum, the two research groups are comparable to each other when it comes to most socio-demographic variables, except for age, occupational status and political orientation – which will be discussed in the next section. However, the respondents are not representative for the entire Dutch population, since the respondents are generally higher educated, more progressive and left-wing politically orientated and slightly more women have filled out the survey. Therefore, the outcomes of this research cannot be generalized to the whole Dutch population.

AGE, OCCUPATIONAL STATUS AND POLITICAL ORIENTATION

As said before, the two research groups are not comparable to each other considering age, occupational status and political orientation. As table 5 shows, 43.9% of the respondents from the control group is aged between 19 and 34, whereas only 20.6% of the main research group is in this age group. Since age is an important factor for participating in environmental civic behaviour (Lubell, 2002, p. 445), and the goal of this research is to compare both research groups to each other, it is important to correct this difference in the data sample. In this research, there is chosen to correct the age difference by weighting the respondents based on their age. The data analyses which will be done using both research groups were done twice – weighted and unweighted. This way, when big differences are shown in the outcomes, the influence of age is made visible.

Table 6 Age groups and weighting factors

	research group			Control group		
Age group	***Quantity***	***Original percentage***	***Weighing factor***	***Quantity***	***Original percentage***	***Weighing factor***
<25	27	9,3%	0,976431	27	10,0%	0,912458
25-29	20	7,2%	1,318182	73	26,9&	0,337484
30-34	12	4,1%	2,19697	19	7,0%	1,296651
35-39	22	7,6%	1,198347	10	3,7%	2,463636
40-44	15	5,2%	1,757576	9	3,3%	2,737374
45-49	27	9,3%	0,976431	11	4,1%	2,239669
50-54	57	19,6%	0,46252	15	5,5%	1,642424
55-59	32	11,0%	0,823864	16	5,9%	1,539773
60-64	35	12,0%	0,753247	11	4,1%	2,239669
65-69	23	7,9%	1,146245	30	11,1%	0,821212
>69	20	6,9%	1,318182	50	18,5%	0,492727
Total	290	100%	1	271	100%	1

Table 7 Occupational status and political orientation within weighted research group and control group

		Groningen		Control group	
Occupation	*Unemployed*	21	7.2%	33	12.2%
	Part time student	7	2.3%	7	2.5%
	Full time student	38	13.0%	35	12.9%
	Part time job	73	25.1%	81	29.6%
	Full time job	123	42.5%	89	33.0%
	Retired	48	16.5%	35	12.7%
	Won't say/ other	26	9.1%	41	15.2%
Political orientation	*Left wing*	157	54.2%	171	63.2%
	Right wing	18	6.1%	12	4.4%
	Progressive	101	35.0%	134	49.4%
	Conservative	11	3.8%	6	2.2%
	Liberal	41	14.2%	39	14.2%
	Socialist	80	27.8%	79	29.3%
	Won't say/ other	50	17.2%	36	13.3%
	Total	290	100%	271	100%

In order to weigh the cases, eleven age groups had to be made. The youngest age groups included the respondents who were 19 years old. The oldest age group consists of people aged from 70 to 101, with only three respondents aged older than 82. Thereafter, the frequencies and percentage of the age groups in each research group were calculated. To make up for the age

difference, each age group had to be corrected to be one eleventh of the research group size. For this purpose, each age group was given a weighting factor, which are also shown in table 6. By weighting the groups using these factors, each group is one eleventh of the research or control group.

The differences between the groups for occupational status and political orientation become smaller when there is a correction made for age. However, the differences are not totally gone. Therefore, these differences have to be kept in mind for the data analysation.

4.2.5 Data Analysis

For the descriptive analysis of the data sample, the transformations of variables and the data analysis itself, the program SPSS IBM Statistics 26 was used. In this section, an elaboration of the data analysis is given.

In order to test the five hypotheses, there was an investigation for three phenomena: correlations (hypotheses 1, 2 and 3), an interaction effect (hypothesis 4) and differences on multiple variables between two independent groups (hypothesis 5).

The largest part of the survey consisted of variable related questions (40 questions for the research group and 30 questions for the control group). These were five-point Likert scale questions. Because five-point Likert scales were used to measure the variables, all the variable related data is ordinal. Because the data is ordinal, nonparametrical tests are preferred. However, when the data is conducted via a Likert scale, parametrical tests are justified to analyse the data, but the data must be interpreted with caution (Norman, 2010; Murray, 2013). Therefore, for hypotheses 1, 2, 3 and 5, nonparametrical tests were used first, and parametrical tests were performed to substantiate the

results of the nonparametrical tests. It was not possible to do a nonparametrical test for hypothesis 4, since there are no nonparametrical tests to test for interaction effects. Therefore, only parametrical tests were used to test hypothesis 4.

CORRELATIONS: HYPOTHESES 1, 2 AND 3

First, to test the hypotheses that assume correlations, the Spearman's Rank-Order Correlation test was performed. This test is a nonparametric variant of the parametric Pearson correlation test. While the Pearson test examines the strength of a linear relationship between two continuous variables, Spearman's Rank test measures the strength of a monotone association between two ordinal variables (Khamis, 2008; Hauke & Kossowski, 2011). This nonparametric correlation test ranks the values of each variable, in contrast to the Pearson test which takes a closer look at the values themselves. Spearman's Rank test 'assesses how well an arbitrary monotonic function can describe a relationship between two variables, without making any assumptions about the frequency distribution of the variables' (Hauke & Kossowski, 2011, p. 87).

Spearman's correlation coefficient can have a value between -1 and 1. The closer the coefficient is to -1 or 1, the stronger the correlation is, with -1 being a perfect negative relationship and 1 being a perfect positive relationship. 0 equals to no correlation at all. Dancey & Reidy (2007) categorized the Spearman's Rho for the fields of psychology and the Political Science Department at Quinnipiac University evaluated the strength of the coefficient for the field of politics (Akoglu, 2018), which is shown in table 8. These categorisations give a good indication of how the correlation coefficient could be interpreted for this research.

However, to substantiate the outcomes of the nonparametrical tests, several regression analyses were conducted. Regression analyses were also to test the effect of place disruption and perceived environmental threat on environmental civic behaviour, and place identity on perceived place disruption. There are four assumptions for linear regression analysis: linearity between the

Table 8 Classifications on the Spearman's Rho correlation coefficients
for the field of psychology according to Dancey & Reidy (2007) and the field of Politics following the political science department at Quinnipiac University (Akoglu, 2018)

Correlation coefficient		Classification for the field of psychology (Dancey & Reidy)	Classification for the field of politics (Quinnipiac University)
+ 1	- 1	Perfect	Perfect
+ 0.9	- 0.9	Strong	Very strong
+ 0.8	- 0.8	Strong	Very strong
+ 0.7	- 0.7	Strong	Very strong
+ 0.6	- 0.6	Moderate	Strong
+ 0.5	- 0.5	Moderate	Strong
+ 0.4	- 0.4	Moderate	Strong
+ 0.3	- 0.3	Weak	Moderate
+ 0.2	- 0.2	Weak	Weak
+ 0.1	- 0.1	Weak	Negligible
0	0	Zero	Zero

independent variable(s) and the dependent variable, normality of the errors of the residuals, no multicollinearity and homoscedasticity (Williams & Grajales & Kurkiewicz, 2013). These assumptions have all been met.

Since leadership actions is a dichotomous variable, logistic regression analyses were performed. For logistic regression, the same assumptions apply, but instead of linearity between the dependent and the independent variables, now there must be linearity between the independent variable(s) on the logit of the dependent variable, which is the chance of partaking in leadership actions which is expressed on a logarithmic scale. Besides that, there is a larger sample size requirement for logistic regression, which is 10 cases per estimated parameter, per category of the dependent variable (Hair, Black, Babin & Anderson, 2013). These assumptions have been met as well.

Interaction effect: hypothesis 4

For the fourth hypothesis, the interaction effect of perceived environmental threat on the relation from place disruption to environmental civic behaviour was tested. Several regression analyses have been performed in order to do this. Unfortunately, there is no nonparametrical test available to test for interaction effects. Despite the variables being measured on an ordinal scale, it is justified to perform a parametric test like a regression analysis, since a regression analysis can clarify if a higher score from the dependent variables, place disruption and perceived environmental threat, also result in a higher score on the dependent variable, environmental civic behaviour. The thing to keep in mind when doing this is, is that it only tells that the scores on both Likert scales correlate, but a conclusion like 'an X amount of increase in place disruption results in a Y amount of increase in participatory actions' cannot be made, since both variables are measured on an ordinal scale (Norman, 2010; Murray, 2013).

For this hypothesis, regression analyses have been performed on the main variable environmental civic behaviour and the sub variables participatory and leadership actions. This way, the effect of perceived environmental threat on the chance of partaking in leadership actions is made visible. Also, by doing a regression analysis with participatory actions as dependent variable, the effect of perceived environmental threat on just participatory actions is made clear, regardless if respondents took part in any leadership actions. These results will be compared to the regression analyses on environmental civic behaviour.

For the effects on the sub variable participatory actions, a multiple linear regression analysis has been conducted. For the sub variable leadership actions, which is dichotomous, multiple logistic regression has been performed. Both tests were performed in order to detect an interaction effect from perceived environmental threat on the relation from place disruption to participatory- and leadership actions. To analyse the effect on the main variable environmental civic behaviour, a multiple regression analysis was performed on both groups for environmental civic behaviour: the group without any leadership actions and the group with leadership actions. For all these regression analyses, the assumptions have been met.

Difference between research groups: hypothesis 5

For the last hypothesis, to find the difference between the research group and the control group, two tests have been performed. First, the nonparametric variant of the T-test, has been performed, name-

Table 9 The hypotheses of this research and the accompanying tests

Hypothesis	Goal	Test
H1 = Place Identity has a positive correlation with Perceived Place Disruption.	correlation	• Spearman's Rho (DV: perceived place disruption) • Simple linear regression (DV: Perceived place disruption)
H2 = Place Disruption has a positive correlation with Environmental Civic Behaviour.	correlation	• Spearman's Rho (DV: participatory- & untransformed leadership actions, & environmental civic behaviour) • Simple linear regression (DV: participatory actions & environmental civic behaviour) • Simple logistic regression (DV: participatory actions)
H3 = Perceived Environmental Threat has a positive correlation with Environmental Civic Behaviour.	correlation	• Spearman's Rho (DV: participatory- & untransformed leadership actions & environmental civic behaviour) • Simple linear regression (DV: participatory actions & environmental civic behaviour) • Simple logistic regression (DV: participatory actions)
H4 = Perceived Environmental Threat has a positive effect on the causal relation between Place Disruption and Environmental Civic Behaviour.	Interaction effect	• Multiple regression (DV: participatory actions &environmental civic behaviour) • Multiple logistic regression (DV: leadership actions)
H5 = The difference between Participatory Actions and Leadership Actions can be explained by Place Disruption, Place Identity and Perceived Environmental Threat.	difference	• Mann-Whitney U (DV: perceived environmental threat, participatory actions, untransformed leadership actions & environmental civic behaviour) • Multiple linear regression (DV: participatory actions & environmental civic behaviour) • Multiple logistic regression (DV: leadership actions)

ly the Mann-Whitney U test. The Mann-Whitney U test tests if the medians of two different groups on a dependent variable are significantly different (Nachar, 2008), instead of the mean values which is used with a T-test. In this research, the difference in medians of both independent variables, perceived environmental threat and dependent variable participatory actions, were compared between the research groups.

Secondly, the same regression analyses have been performed as with hypothesis 4, but now, instead of place disruption the dichotomous variable 'Groningen' is used. Besides that, because now the two groups are compared to each other, all tests for this hypothesis were conducted twice: weighted and unweighted.

4.3 Validity and reliability

A proportionated distribution of demographics amongst the respondents was necessary for the representability and generalisability of the research. This is also known as the external validity. As seen in the previous section, the respondents are not a perfect representation of the Dutch population. The

control group is fairly young and the survey was promoted amongst a group of people who are generally higher educated and politically more left-wing and progressively orientated. Therefore, this study is not representative of the Dutch population and, therefore, not generalisable for the whole Dutch public. However, this study does clarify how place disruption, place identity, perceived environmental threat and environmental civic behaviour manifest in specific groups of people, like young, highly educated and left-wing and progressively orientated people. Besides that, this study was built on the work of several scientific studies. Therefore, this study adds to the scientific knowledge in the field of place disruption and environmental civic behaviour, and is to some extent generalisable in a theoretical way.

Besides external validity, there is internal validity. The internal validity comes into play when the questions in the survey and the interviews are unclear. This causes ambiguity and therefore it is not possible to conduct empirical evidence. There was one question which made respondents report some ambiguity. The question about the belief that climate change is partly caused by human interaction was formulated like this:

Do you believe that climate change is partly caused by humans and their actions?

a. Absolutely agree
b. Mostly agree
c. Mostly disagree
d. Absolutely disagree

Because the statement said that climate change is partly caused by human interaction, and people were able to indicate that they *mostly* agreed or disagreed, it is ambiguous what respondents meant by that. The people who answered that they absolutely agreed or mostly agreed with the statement were included in the dataset. Because this question was formulated so ambiguously, it is possible that some people who actually do believe in human caused climate change, were excluded from the data analysation. There were no reports of respondents on other questions about ambiguity.

Another way of checking for internal validity, is by having control questions in the survey. One way of doing that, is by rephrasing questions. One example of such a question was for perceived place disruption for the people of Groningen. The first three questions were formulated positively (for example: I feel sad because of the earthquakes in Groningen) whereas the fourth question was formulated negatively (I do not care about the earthquakes is Groningen). That way, it was possible to check if the respondents actually have read the questions carefully. There were no cases in the dataset where that was the case, so this is an indication that these people have read the questions of the survey carefully. However, there was not such a control question for the control group, and the previous mentioned control question on place disruption was asked early in the survey. Therefore, there is no 100% guarantee that every respondent has have read all the questions carefully. On the other hand, the survey was already quite long and more control questions would have made the survey even longer. And, the people who have not filled out the questions on about the socio-demographic variables at the end of the survey, were excluded from the data analysis. By excluding these respondents, presumably most respondents who did not take the time to read the questions carefully and fill out the questions were excluded.

Regarding the reliability, the reproducibility of the research, it is also important to get a representative and random sample of respondents. Therefore, it was important not to provide too much information about the survey. When potential respondents contemplated to take part in the survey based on the information already given, there was a possibility that the respondents taking part in the survey were biased. Therefore, the survey was promoted only with the question if people wanted to help the researcher. However, to generate more traction for the survey via social media, the hashtags '#climate' and '#naturalgas' and '#Groningen' were added. Since only these hashtags highlighted the subject of the survey, the bias people may have had because of this was probably limited. The survey was also promoted by organisations and people with a specific group of followers, which resulted in the more left-wing and progressive orientated respondents.

This research was meant to find solid, empirical indication if place disruption influences environmental civic behaviour in the case that place disruption and the subject of environmental civic behaviour have a similar cause. Since this research focusses only on the case of Groningen, the results are an empirical indication of this correlation.

5. RESULTS

In this chapter, the results of the data analysis will be presented. First, the first three hypotheses will be discussed, in order to clarify correlations between the variables place disruption, place identity, perceived environmental threat and environmental civic behaviour, using both nonparametrical and parametrical tests. Thereafter, the fourth hypothesis is examined and the results of the regression analyses are given, concerning the interaction effect between the variables place disruption, perceived environmental threat and environmental civic behaviour. Lastly, the two research groups were compared to each other to detect differences in variations of the variables perceived environmental threat and environmental civic behaviour, in contemplation of the fifth hypothesis. This chapter will conclude with an examination of the 5 hypotheses formulated for this research.

5.1 CORRELATIONS: PLACE IDENTITY, PLACE DISRUPTION, PERCEIVED ENVIRONMENTAL THREAT & ENVIRONMENTAL CIVIC BEHAVIOUR

In this section, the results of the tests of the first three hypotheses will be given. For each hypothesis, first the results of the nonparametrical tests will be shown. Second, these results will be substantiated with the results of the parametrical tests, which are regression analyses.

5.1.1 PLACE IDENTITY & PERCEIVED PLACE DISRUPTION

The first hypothesis, 'place identity has a positive correlation with perceived place disruption' was tested both via a Spearman's correlation test and via a regression analysis. The results of these tests are shown in table 10 and 11.

The results of the Spearman's correlation tests show significant and moderate - for the field of sociology – to strong – for the field of political science – correlation coefficients. This means that people who, for example, scored high for place identity were also moderately likely to score high on perceived place disruption, and vice versa. This correlation goes both ways, since Brown & Perkins showed that place disruption can unveil bonds with a place that are otherwise latent (1992).

The results of the Spearman's correlation test are substantiated by the regression analysis, of which the results are shown in table 11. With an R^2 of 0.161, 16,1% of the variance in perceived place disruption is explained by place identity. With a minimum score for place identity of 1, and a maximum of 5, the coefficient of 0.238 is quite strong, especially since perceived place disruption has a range from 0 to 1. This means that in 16.1% of the cases, approximately, a maximum score for place identity goes hand in hand with a maximum score for perceived place disruption.

Since the survey also got information from 65 respondents who have lived in Groningen, but did not live there anymore when filling out the survey, this gave the opportunity to analyse the effect of place identity on place disruption whilst not living at the place of the disruption. This resulted in a slightly stronger correlation coefficient. This means that also for these people who, for example, scored high for place identity were also moderately likely to score high on perceived place disruption, and vice versa. These findings were confirmed by the substantiative regression analysis, which showed a significant model, with a higher explanatory value (23.8%), but a weaker Beta coefficient than the model which considers the whole research group.

Table 10 Results of Spearman's Rho correlation test place identity & perceived place disruption

	Perceived place disruption			
	Whole research group	**Currently living in Groningen**	**Previously living in Groningen**	**Having experienced physical place disruption**
Place identity	0.428**	0.429**	0.472**	0.224
N	289	224	65	77

** Significant with p<0.01

Table 11 Results simple linear regression place identity on perceived place disruption
Unstandardized B-coefficients and standard errors

	Perceived place disruption			
	Whole research group	**Currently living in Groningen**	**Previously living in Groningen**	**Having experienced physical place disruption**
Constant	0.083** (0.011)	0.168* (0.069)	0.306** (0.061)	0.415** (0.146)
Place identity	0.238** (0.048)	0.098** (0.016)	0.071** (0.071)	0.065* (0.031)
R^{2a}	0.158**	0.146**	0.226**	0.042*
N	289	224	65	77

a Significant R2 values indicate total significance of the model

* Significant with p<0.05 ** Significant with p<0.01

On the other hand, the correlation between place identity and perceived place disruption for the 77 respondents who have experienced place disruption due to the earthquakes was not significant. This means that there is an ambiguous relation for the people who have experienced place disruption between place identity and perceived place disruption. The substantiative regression analysis showed a significant model, but the explanatory value of this model is quite low (4.2%) and also the strength of the Beta coefficient of place identity is quite weak in comparison with the model considering the whole research group.

In conclusion, there is a positive correlation between place identity and perceived place disruption, and this correlation is to be classified as moderate to strong. This means that people who are strongly connected to the province of Groningen, are more likely to experience anxiety, for example, due to the earthquakes in Groningen. This conclusion is not as firm for the 77 respondents who have actually experienced the place disruption, for example the people who live in damaged houses. The results of the tests on this group show less significant results and the correlation is weaker. This means that the effect of place identity on the perception of the earthquakes in Groningen is less prominent for the people who have experienced the earthquakes and have negative effects from this, than for the people who have not experienced negative physical effects from the earthquakes.

5.1.2 Place disruption & environmental civic behaviour

The second hypothesis, place disruption has a positive correlation with environmental civic behaviour, is tested via multiple Spearman's Rho correlations tests and several regression analyses. The results are provided in tables 12 to 16.

First, the results of the Spearman's correlation tests show less significant and weaker results than for the previous hypothesis, the correlation between place identity and perceived place disruption. The only significant results came from perceived place disruption and total place disruption when it was tested towards the sub variables of environmental civic behaviour separately: participatory and leadership actions. The significant coefficients range from 0.174 to 0.260, which means that these correlations are to be classified as negligible or weak. No significant correlations were founded with physical place disruption and both sub variables of environmental civic behaviour. There is also no significant correlation between place disruption, and its sub variables, with main variable environmental civic behaviour - when participatory and leadership actions were combined.

The substantive regression analyses – of which the results are shown in tables 14 to 16 - all show very low R2's, which is the value that clarifies the explanatory value of a regression model. The R2's for these simple regression models are all below 0.1, which indicates that not even 10% of the variance of both categories in environmental civic behaviour is explained by place disruption and its sub variables. The R2 for physical place disruption on environmental civic behaviour with leadership is higher than 0.1, but since the population size used for this test is only 34, this outcome must be interpreted with much caution.

The coefficients for place disruption and its sub variables are quite low as well, which is especially low since the variance of these variables ranges from 0 to 1. This emphasizes how little the influence is from place disruption on environmental civic behaviour and its sub variables. However, perceived place disruption has some higher coefficients on both participatory actions and leadership

Table 12 Spearman's correlation tests place disruption, participatory actions & leadership actions

	Participatory actions		**Leadership Actions (untransformed)**	
	Spearman's Rho	N	Spearman's Rho	N
Perceived place disruption	0.260**	289	0.227**	284
Physical place disruption (only people who experienced it)	0.131	77	0.081	75
Total Place disruption	0.174**	289	0.184**	284

** Significant with p<0.01

Table 13 Spearman's correlation tests place disruption & environmental civic behaviour

Environmental civic behaviour	**No leadership actions**		**With leadership actions**	
	Spearman's Rho	N	Spearman's Rho	N
Perceived place disruption	0.124	171	0.146	112
Physical place disruption (only people who experienced it)	0.002	43	0.242	31
Total Place disruption	0.041	171	0.049	112

actions, 1.008 and 2.219 respectively, which were conducted with a valid population size. However, when looking at the results for environmental civic behaviour, the coefficients are lower: 0.413 for environmental civic behaviour without leadership actions and no significant coefficient for environmental civic behaviour with leadership actions.

Table 14 Results linear regression with dependent variable participatory actions

Unstandardized B-coefficients and standard errors

	Simple linear regression		
	Model 1	**Model 2**	**Model 3[b]**
Constant	2.087** (0.091)	1.666** (0.135)	1.535* (0.498)
Total place disruption	0.408* (0.186)		
Perceived place disruption		1.008** (0.216)	
Physical place disruption			0.797 (0.537)
R^2 [a]	0.013*	0.067**	0.016
N	289	289	77

[a] Significant R^2 values indicate total significance of the model

[b] the regression analyses for these models have been performed with the respondents who experienced physical place disruption

* Significant with p<0.05 ** Significant with p<0.01

Table 15 Results logistic regression with dependent variable leadership actions

Unstandardized B-coefficients and standard errors

	Simple logistic regression		
	Model 1	**Model 2**	**Model 3[b]**
Constant	-0.785** (0.224)	-1.691** (0.375)	-0.854 (1.194)
Total place disruption	0.991* (0.447)		
Perceived place disruption		2.219** (0.584)	
Physical place disruption			0.679 (1.283)
Pseudo R^2 (Nagelkerke) [a]	0.023*	0.071**	0.005
N	289	289	77

[a] Significant pseudo R^2 values indicate total significance of the model, which is indicated by chi-square

[b] the regression analyses for these models have been performed with the respondents who experienced physical place disruption

* Significant with p<0.05 ** Significant with p<0.01

Table 16 Results simple linear regression analyses environmental civic behaviour

Unstandardized B-coefficients and standard errors

	Environmental civic behaviour (no leadership actions)			Environmental civic behaviour (with leadership actions)		
	Model 1	**Model 2**	**Model 3[b]**	**Model 4**	**Model 5**	**Model 6[b]**
Constant	1.758** (0.073)	1.578** (0.104)	1.839** (0.404)	2.828** (0.145)	2.518** (0.254)	1.121 (0.750)
Total place disruption	0.116 (0.156)			0.182 (0.275)		
Perceived place disruption		0.413* (0.175)			0.610 (0.378)	
Physical place disruption			-0.068 (0.439)			1.897* (0.801)
R^2 a	-0.003	0.026*	-0.024	-0.005	0.014	0.123*
N	171	171	43	118	118	34

a Significant R2 values indicate total significance of the model

b the regression analyses for these models have been performed with the respondents who experienced physical place disruption

* Significant with p<0.05 ** Significant with p<0.01

In conclusion, the extent to which someone has experienced place disruption, either physical and/or more psychological, does not strongly correlate with the amount someone participates in environmental civic behaviour. The best correlations found, were only weak. The way someone perceives the earthquakes in Groningen – perceived place disruption – seems to have the strongest correlation with the amount someone participates in participatory actions – which are civic actions for the environment that do not require much effort. However, as soon as the participation in leadership actions was added to this, the influence from perceived place disruption lessened.

5.1.3 Perceived environmental threat & environmental civic behaviour

In tables 17 to 20 the results of the tests corresponding to hypothesis 3, perceived environmental threat has a positive correlation with environmental civic behaviour, are given. Also for this section, first the results of the nonparametrical Spearman's correlation test will be discussed. Thereafter, the results of the substantiative regression analyses are examined. Since both the research group and the control group are used for these tests, the tests were also performed weighted, to control for the differences in age between the groups.

The Spearman's test shows that all assumed correlations between perceived environmental threat and environmental civic behaviour and its sub variables are significant. The strength of the correlations differs, since perceived environmental threat with participatory actions and perceived environmental threat with environmental civic behaviour without any leadership actions could be classified as moderate or strong, whereas the other correlations are to be classified as weak or moderate. This means that the extent to which someone perceives climate change as a threat correlates more strongly with the amount someone participates in participatory actions, which do not require much effort and skills, than with leadership actions, which do require more effort and skills. The correlation is even stronger for people who do not participate in any leadership actions, than for people who do participate in leadership actions.

The substantiative regression analyses show similar results: perceived environmental threat has a positive effect on participatory actions, leadership actions and environmental civic behaviour. Since the (pseudo) R^2 values are stronger for the regression models with participatory actions and environmental civic behaviour without any leadership actions, the same conclusion can be made that perceived environmental threat explains more variance of participatory actions and environmental civic behaviour without any leadership actions than for leadership actions and environmental civic behaviour with leadership actions.

Since these analyses were performed on the whole data sample, each analysis was also performed weighted to correct for the age difference between the research and the control group. For most analyses, the weighted analysis showed lower correlation coefficients or R^2-values. This indicates that age influences the willingness to take part in environmental civic behaviour, since perceived environmental threat has a bigger influence on environmental civic behaviour and its sub variables when a correction for age was not made. The opposite is true for environmental civic behaviour.

Also worth mentioning, is that the explained variance of perceived environmental threat on environmental civic behaviour and its sub variables is higher than the explained variance by the

regression models used for testing the previous hypothesis. Perceived environmental threat therefore explains more variance of environmental civic behaviour than place disruption and its sub variables did.

In sum, perceived environmental threat has a positive influence on environmental civic behaviour. The more people perceive climate change as a threat, the more likely they are to participate in environmental civic behaviour. This effect is the strongest on the actions that do not require much skill and/ or talent, which are participatory actions.

Table 17 Spearman's correlation tests perceived environmental threat,
participatory actions, leadership actions & each category of environmental civic behaviour

	Per sub variable			
	Participatory actions		**Leadership actions (untransformed)**	
	Weighted	**Unweighted**	**Weighted**	**Unweighted**
Perceived environmental threat	0.492**	0.499**	0.345**	0.377**
N	488	559	481	549
	Environmental civic behaviour			
	No leadership actions		**With leadership actions**	
	Weighted	**Unweighted**	**Weighted**	**Unweighted**
Perceived environmental threat	0.532**	0.461**	0.275**	0.286**
N	248	286	240	273

** Significant with p<0.01

Table 18 Results simple linear regression perceived environmental threat on participatory actions
Unstandardized B-coefficients and standard errors

	Weighted	**Unweighted**
Constant	0.383* (0.169)	0.340* (0.163)
Perceived environmental threat	0.545** (0.045)	0.555** (0.044)
R^{2a}	0.207**	0.221**
N	560	559

[a] Significant R^2 values indicate total significance of the model.
* Significant with p<0.05 ** Significant with p<0.01

Table 19 Results logistic regression perceived environmental threat on leadership actions
Unstandardized B-coefficients and standard errors

	Weighted	**Unweighted**
Constant	-3.989** (0.578)	-4.634** (0.600)
Perceived environmental threat	1.059** (0.152)	1.246** (0.159)
Pseudo R^{2a} (Nagelkerke)	0.136**	0.176**
N	559	559

[a] Significant pseudo R^2 values indicate total significance of the model, which is indicated by chi-square
* Significant with p<0.05 ** Significant with p<0.01

Table 20 Results simple linear regression perceived environmental threat on environmental civic behaviour
Unstandardized B-coefficients and standard errors

	Environmental civic behaviour (no leadership actions)		Environmental civic behaviour (with leadership actions)	
	Weighted	**Unweighted**	**Weighted**	**Unweighted**
Constant	0.857** (0.125)	0.906** (0.124)	1.249** (0.322)	1.234** (0.318)
Perceived environmental threat	0.292** (0.035)	0.275** (0.036)	0.433** (0.081)	0.430** (0.081)
R^{2a}	0.194**	0.171**	0.091**	0.092**
N	286	286	274	273

[a] Significant R^2 values indicate total significance of the model.
* Significant with p<0.05 ** Significant with p<0.01

5.2 Interaction effect: Place disruption, perceived environmental threat & environmental civic behaviour

To test the effect of perceived environmental threat on the correlation between place disruption and environmental civic behaviour, several regression analyses have been performed. In this section, the results of the regression analyses for the sub variables of environmental civic behaviour, participatory- and leadership actions, are presented. Thereafter, the multiple regression analyses on both groups of environmental civic behaviour are presented.

5.2.1 Participatory actions

In table 21 the results from the regression analyses for place disruption and its sub variables, with perceived environmental threat to the dependent variable participatory actions are given.

The results of the simple linear regression with perceived environmental threat on participatory actions, model 1, indicate the influence of perceived environmental threat on participatory actions alone, which is useful to compare the results of the multiple regression analyses to. The first thing that should be pointed out, is that the explanatory value, R^2, of the more complex models is only slightly stronger than the simple regression model with only perceived environmental threat as a predictor. This demonstrates that place disruption and its sub variables only explain a small bit of the variance in participatory actions.

Not every intercept and unstandardized beta coefficient of the models presented in tables 21 significant, but the model which is significant still explains some variance of participatory actions. This means that the whole model explains some variance of participatory actions, but that the coefficients and intercepts which are not significant do not differ significantly from 0. The influence of the variables with coefficients that are not significant, is therefore marginal. The only interaction effect that is significant is the interaction effect of perceived environmental threat and perceived place disruption.

All significant coefficients are positive values, which indicates positive relations between the predictor variables and participatory actions. For example: the first model shows that a higher score on perceived environmental threat is likely to result in a higher score for participatory actions.

Table 21 Results simple & multiple linear regression analyses with interaction effect on participatory actions
Unstandardized B-coefficients and standard errors

	Participatory actions			
	Model 1	**Model 2**	**Model 3**	**Model 4[b]**
Constant	0.426* (0.207)	0.715* (0.341)	1.331* (0.456)	-7.447 (4.557)
Perceived environmental threat	0.520** (0.058)	0.409** (0.098)	0.152 (0.137)	2.233 (1.169)
Total place disruption		-0.644 (0.691)		
Perceived place disruption			-1.455 (0.787)	
Physical place disruption				7.788 (4.635)
Interaction		0.249 (0.194)	0.589** (0.225)	-1.662 (1.192)
R^{2a}	0.219**	0.223**	0.250**	0.319**
N	288	288	288	77

[a] Significant R^2 values indicate total significance of the model.

[b] the regression analyses for this model has been performed with the 77 respondents who experienced physical place disruption

* Significant with $p<0.05$ ** Significant with $p<0.01$

Although place disruption and the interaction effects with perceived environmental threat clarify a bit more variance, the difference with the model just with perceived environmental threat is marginal. Therefore, the conclusion is that the influence of place disruption, as well as both perceived- and physical place disruption, on participatory actions is negligible.

5.2.2 Leadership actions

In table 22 the results of the logistic regression analyses for total place disruption and its sub variables, with perceived environmental threat to the dependent sub variable leadership actions are given. Since leadership actions is a binary variable, the results show the relationship of the predictor variables to the chance of partaking in leadership actions.

For logistic regression, the explanatory value of a model could be interpreted with a pseudo R^2, Nagelkerke R^2. This pseudo R^2 is the alternative to the R^2 used in linear regression, but does not have a strict classification on how good the explanatory is. However, both the simple and complex models produce not higher pseudo R^2 values than 0.179, which indicates that the models do predict some variance, but also a lot of variance is not explained by these models.

For the more complex models, only perceived environmental threat is significantly different from 0 in model 2 and 3. The other variables and the interaction effects do not differ significantly from 0. Individually, perceived environmental threat (model 1 in table 22), place disruption and perceived place disruption (model 1 and 2 in table 15) do have a significant influence on the chance of participating in leadership actions.

Since all significant coefficients are positive, the conclusion can be made that the influence from the dependent variables on leadership actions is positive as well. This means that, for example, a higher score on perceived environmental threat results in a higher chance of partaking in leadership actions.

Table 22 Results multiple logistic regression with interaction effect on leadership actions
Unstandardized B-coefficients and standard errors

	Leadership actions			
	Model 1	**Model 2**	**Model 3**	**Model 4[b]**
Constant	-4.035** (0.746)	-5.429** (1.417)	-7.379* (2.329)	-0.021 (13.214)
Perceived environmental threat	1.019** (0.201)	1.315** (0.387)	1.689* (0.643)	-0.327 (3.380)
Total place disruption		3.278 (2.452)		
Perceived place disruption			6.063 (3.426)	
Physical place disruption				-3.384 (13.529)
Interaction		-0.690 (0.670)	-1.242 (0.938)	1.243 (3.473)
Pseudo R^{2a}	0.142**	0.158**	0.179**	0.130*
N	288	288	288	77

[a] Significant (pseudo) R^2 values indicate total significance of the model. For the logistic regression is this indicated by chi-square
[b] the regression analyses for these models have been performed with the 77 respondents who experienced physical place disruption
* Significant with p<0.05 ** Significant with p<0.01

The models with an interaction effect have slightly more explanatory value. However, these pseudo R^2 indicate that also for these models the unexplained variance is still quite high. Besides that, there is no interaction effect with a coefficient significantly different than 0. Also in this case, perceived environmental threat seems to have the most influence on the chance of partaking in leadership actions, since the R^2 value of the simple regression model with perceived environmental threat is only a little bit lower than the more complex models which include place disruption and an interaction effect.

Since the only significant variable in these logistic regression models is perceived environmental threat, and the explained variance of the models only increases a little bit when place disruption is added to the regression models, the conclusion of these tests is that the chance of participating in leadership actions is mostly explained by the extent to which someone perceives climate change as a threat. The influence from place disruption – both in perception and physical – on the chance of participating in civic behaviour that requires more skills and knowledge is marginal.

5.2.3 Environmental civic behaviour

The results from the regression analyses on both categories of environmental civic behaviour show less significant results, which can be seen in table 23. Although all regression models are significant, there are less variables in these models that are significantly different from 0 compared to the regression models for the sub variables of environmental civic behaviour. For environmental civic behaviour with leadership actions, the second category of environmental civic behaviour, only perceived environmental threat has a significant influence on the dependent variable. For the first category of environmental civic behaviour, without leadership actions, perceived place disruption and physical place disruption do have significant influences on de dependent variable when it is combined with perceived environmental threat. The results from the models using physical place disruption must be interpreted with caution, as the population size is quite low, 43 and 34.

The explanatory value of the models for environmental civic behaviour, in both categories, is quite the same as seen with the other regression models: most of them are below 0.3, which indicates a low explanatory value.

Table 23 Results simple & multiple linear regression analyses with interaction effect on environmental civic behaviour

Unstandardized B-coefficients and standard errors

	Environmental civic behaviour (no leadership actions)				Environmental civic behaviour (with leadership actions)			
	Model 1	**Model 2**	**Model 3**	**Model 4[b]**	**Model 5**	**Model 6**	**Model 7**	**Model 8[b]**
Constant	0.966** (0.164)	1.130** (0265)	1.770** (0.347)	-8.816* (3.810)	0.897* (0.430)	1.360 (0.874)	1.540 (1.414)	-4.694 (7.227)
Perceived environmental threat	0.252** (0.048)	0.198* (0.081)	-0.037 (0.110)	2.705** (0.976)	0.529** (0.111)	0.392 (0.227)	0.285 (0.370)	1.448 (1.857)
Total place disruption		-0.459 (0.600)				-0.801 (1.386)		
Perceived place disruption			-1.563* (0.646)				-0.849 (1.998)	
Physical place disruption				10.044* (3.889)				5.305 (7.312)
Interaction		0.148 (0.179)	0.541** (0.194)	-2.535* (1.002)		0.245 (0.357)	0.338 (0.517)	-0.813 (1.882)
R^2 [a]	0.136**	0.129**	0.169**	0.178*	0.157**	0.148**	0.156**	0.452**
N	171	171	171	43	117	117	117	34

[a] Significant R^2 values indicate total significance of the model

[b] the regression analyses for these models have been performed with the respondents who experienced physical place disruption

* Significant with p<0.05 ** Significant with p<0.01

In conclusion, perceived environmental threat does influence the relation between place disruption and environmental civic behaviour when there is one. On the other hand, when perceived environmental threat was added to the models, the relation between place disruption and environmental civic behaviour disappeared in most cases. The risk perception of climate change is a more important factor when it comes to taking part in environmental civic behaviour. Place disruption only plays a role for the group of people who do not participate in leadership actions. For leadership actions, the civic behaviour which require more skills and time, the extent to which place disruption is perceived or experienced is not an important factor.

5.3 Differences between research groups: perceived environmental threat & environmental civic behaviour

With exception to paragraph 5.1.3, this chapter so far focussed on the research group – the people from Groningen. In this section, the research group will be compared to the control group, in order to detect relevant differences. In order to test the fifth hypothesis, 'the difference between participatory actions and leadership actions can be explained by place disruption, place identity and perceived environmental threat', the differences between the research and control group in perceived environmental threat will be analysed first. This is done using a nonparametrical, a Mann-Whitney U-test, test to compare the mean ranks of perceived environmental threat of each group. Thereafter, an analysis is given on the differences in participatory actions and leadership actions between the research and the control group. For this, a Mann Whitney U test is also used. These results were substantiated by regression analyses. Lastly, the differences in environmental civic behaviour between

the two groups were analysed, with the use of a Mann Whitney U Test and substantiative regression analyses. Because the groups were compared to each other, the tests were performed twice: weighted and unweighted.

5.3.1 Differences in perceived environmental threat

Table 24 and figure 4 show that the perception of climate change as a threat is different amongst the research group and the control group. The people who never have lived in the province of Groningen score higher on perceived environmental threat than the people from Groningen do. This means that the respondents from Groningen do not perceive climate change as much as a threat as the people outside from Groningen do.

Since the whole data sample was used for this analysis, the analysis was performed twice in order to detect the effect of age. The weighted sample shows lower mean scores for both groups, and that effect is larger slightly larger for the research group. For the research group, this is a difference

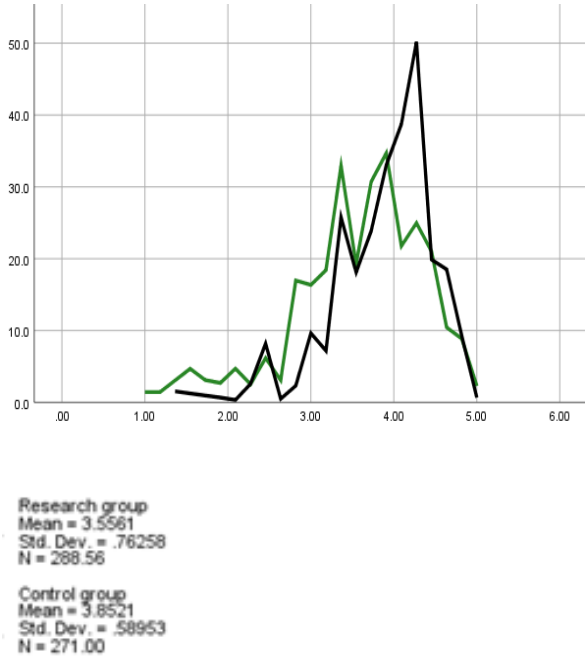
Table 24 Mean ranks per groups for perceived environmental threat and participatory actions

	Research group		Control group	
	Weighted	**Unweighted**	**Weighted**	**Unweighted**
Perceived environmental threat**	215.21	251.75	277.63	310.02
N	289	288	271	271

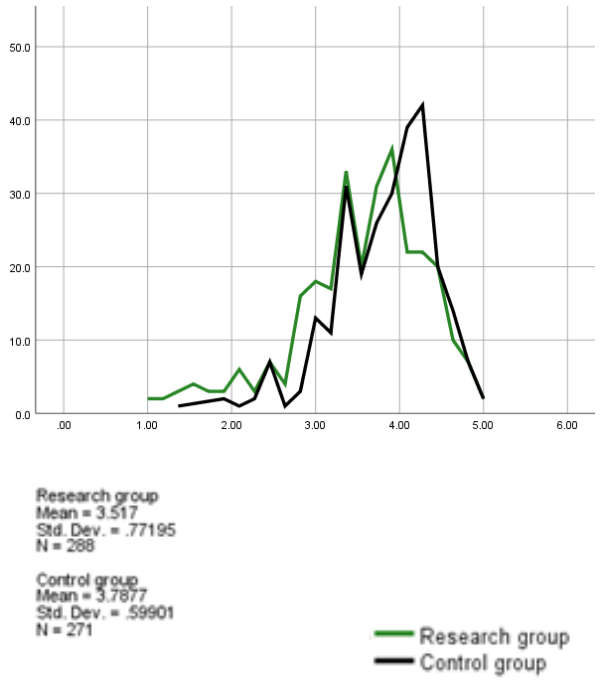
** p<0.01

Figure 4 Distributions of perceived environmental threat, by research group and control group

Weighted



Unweighted



of 36,54 and for the control group, this is a difference of 32,39. When looking at figure 4 it becomes visible that the correction for age makes a higher peak between 4 and 5 for the control group, whereas the distribution for the research group remains somewhat the same. This suggests that regardless of age, the people outside of Groningen perceive climate change more as a threat than the people who are from the province of Groningen.

The differences between the groups on perceived environmental threat are bigger than the differences between the groups for gender, occupational status and political orientation. This suggests that the differences in perceived environmental threat between these groups is not solely caused by the differences in these socio-demographic variables.

5.3.2 Differences in participatory actions & leadership actions

In table 25 the results of the Mann-Whitney U test are given. These results show that the respondents who are not from the province of Groningen participate more in both participatory actions and leadership actions. Since the differences between the weighted and unweighted analyses are bigger for the research group than for the control group, this suggests that the influence of age is different than expected. The expectation was that the younger people are, the more likely they are to participate in environmental civic behaviour. However, when a correction for age is made by weighting the cases accordingly, the differences between the research group and the control group become even bigger.

The same pattern is visible in figure 5 which show the distributions of participatory actions amongst the research group and the control group. The weighted data sample shows a bigger difference between both groups than the unweighted sample. For leadership actions, however, the distributions remain somewhat the same (see figure 6).

Besides the difference in participatory actions and leadership actions between the groups, the groups also differ in perceived environmental threat. The effect of this can be seen with the help of regression analyses. The results of the used regression analyses can be seen in tables 26 and 27.

All regression models are significant, but not all input variables differ significantly from 0. Only perceived environmental threat influences the dependent variable significantly. The explanatory values of the models are only slightly better than the explanatory values of the simple regression models which only have perceived environmental threat in the model. By adding 'Groningen' and the necessary interaction effect to the model, it becomes visible if the groups significantly differ from each other when the differences of perceived environmental threat are taken into account. Since the explanatory values of these models are only slightly better than the corresponding simple models, and

Table 25 Mean ranks per group for participatory actions and leadership actions

	Research group		Control group	
	Weighted	**Unweighted**	**Weighted**	**Unweighted**
Participatory Actions**	216.18	255.13	277.72	307.56
Leadership actions (untransformed)**	215.07	252.81	270.94	299.72
N	560	559	559	559

** p<0.01

Figure 5 Distributions of participatory actions, per group

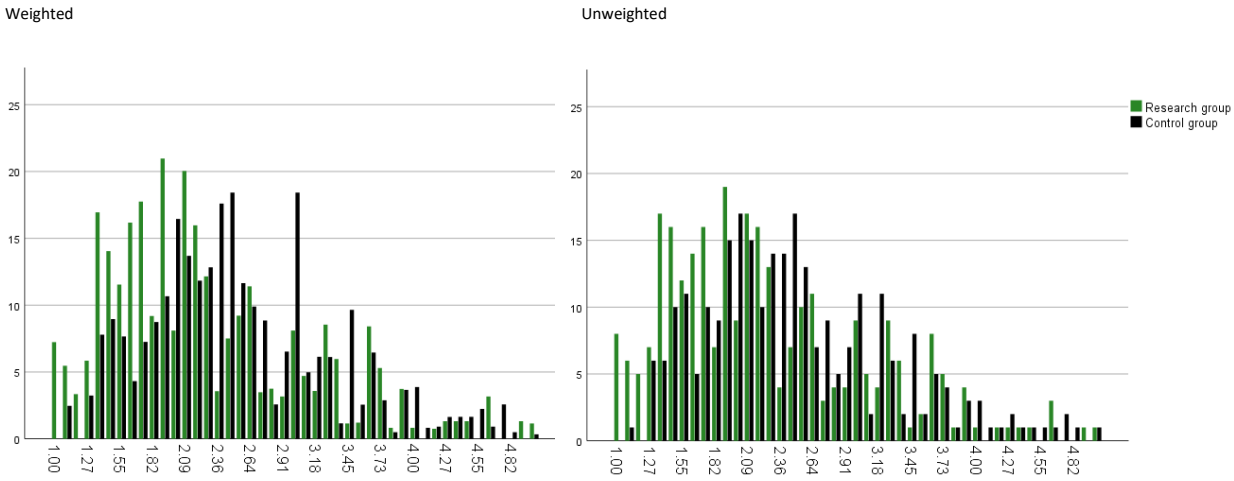
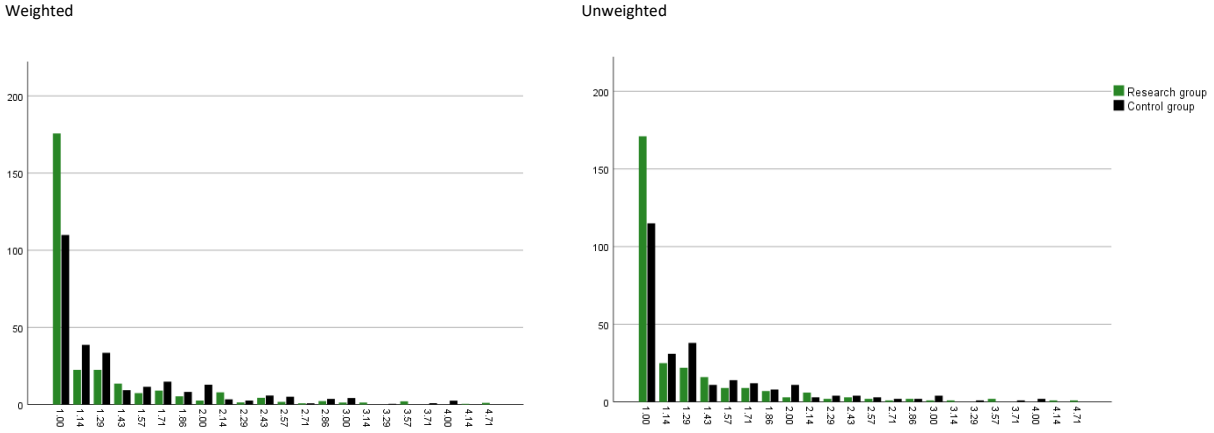


Figure 6 Distributions of leadership actions, per group



the influence of each individual variable 'Groningen' and the interaction effect is not significant, this indicates that the differences between the research group and the control group can only be explained by the differences in perceived environmental threat.

The differences between the groups on participatory actions and leadership actions threat are bigger than the differences between the groups for gender, occupational status and political orientation. This suggests that the differences in these actions between these groups is not solely caused by the differences in these socio-demographic variables.

Al though both groups differ from each other when looking at both participatory and leadership actions, these differences can mostly be explained by the differences in the way each group perceived climate change as a threat.

Table 26 Results multiple linear regression on participatory actions

Unstandardized B-coefficients and standard errors

	Weighted	Unweighted
Constant	0.458 (0.299)	0.261 (0.286)
Perceived environmental threat	0.541** (0.077)	0.587** (0.074)
Groninger	-0.035 (0.364)	0.165 (0.350)
Interaction	-0.024 (0.096)	-0.067 (0.093)
R^{2a}	0.210**	0.222**
N	560	559

[a] Significant R^2 values indicate total significance of the model

** p<0.01

Table 27 Results multiple logistic regression on leadership actions

Unstandardized B-coefficients and standard errors

	Weighted	Unweighted
Constant	-4.071** (0.956)	-5.178** (0.989)
Perceived environmental threat	1.161** (0.247)	1.452** (0.259)
Groninger	-0.529 (1.199)	-1.143 (1.239)
Interaction	0.304 (0.314)	0.433 (0.328)
Pseudo R^2 (Nagelkerke) [a]	0.163**	0.194**
N	559	559

a Significant pseudo R2 values indicate total significance of the model, indicated by chi-square

** p<0.01

5.3.3 Differences in environmental civic behaviour

The results of the Mann-Whitney U tests – which are shown in table 28 - show that there is a significant difference between the research group and the control group. In the first category of environmental civic behaviour, the category without any participation in leadership actions, the respondents from the control group scored higher. There is no significant difference between the two groups for the second category of environmental civic behaviour – the category with participation in leadership actions. Relatively, more people from the research group score within the first category of environmental civic behaviour than in the second category and it it's the other way around for the control group.

Al though the mean ranks between the groups do not differ significantly for the second category of environmental civic behaviour, the distributions show some remarkable differences between the groups within this category when a correction for the age difference is made. The control group seems to score quite higher than the research group.

The uncorrected figures show less differences within the distributions. This suggests that age does not have the expected effect on environmental civic behaviour. The expectation was that the younger people are, the more likely they are to participate in environmental civic behaviour. Because a correction was made by weighting the cases accordingly, it was to be expected that the discrepancy between the groups would have lessened. However, the opposite is true.

Table 28 Mean ranks per group for participatory actions and leadership actions

	Research group		Control group	
	Weighted	Unweighted	Weighted	Unweighted
Environmental civic behaviour without leadership actions *	117.31	133.74	137.35	158.01
N	159	171	89	115
Environmental civic behaviour with leadership actions	118.53	138.83	122.78	136.50
N	100	118	140	156

* p<0.05

Figure 7 Distributions of environmental civic behaviour, per group, weighted

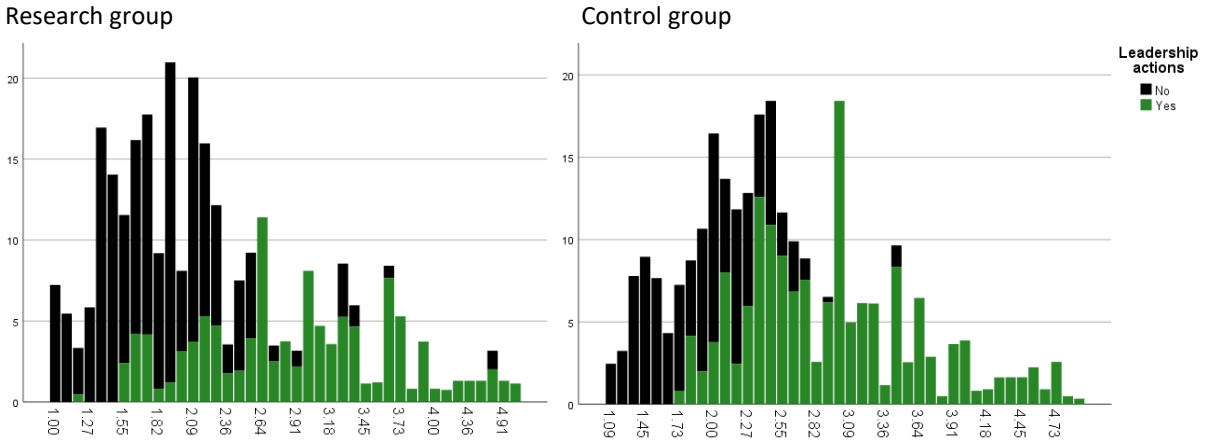
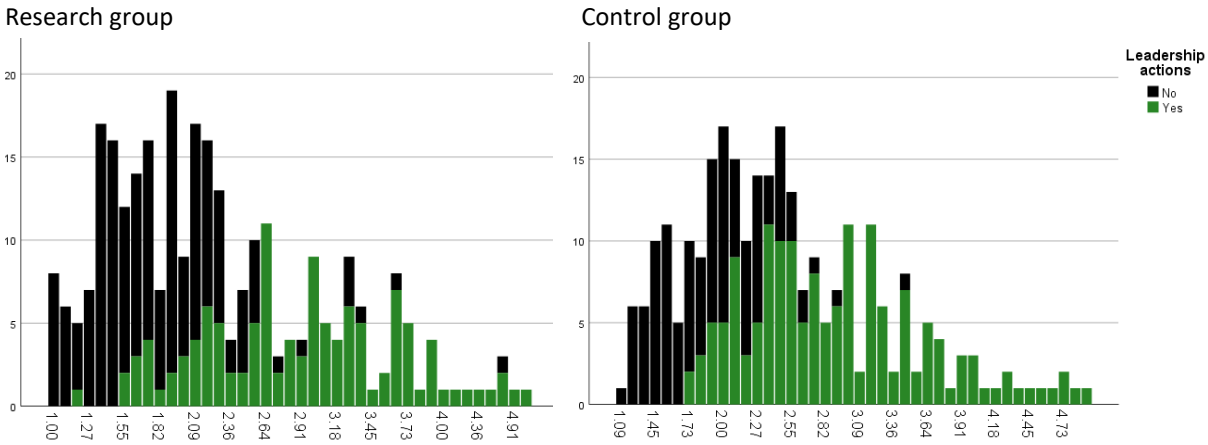


Figure 8 Distributions of environmental civic behaviour, per group, unweighted



The substantiative regression analyses show similar results as the regression analyses for the individual sub variables did, see table 29. There is no significant difference between the research group and the control group when perceived environmental threat was taken into consideration; the differences between the research group and the control group can be explained by the difference in perceived environmental threat. The explanatory models of the regression models with 'Groningen' and the interaction effect remain roughly as the simple regression model with only perceived environmental threat. This means that it does not matter to which group someone belongs.

Table 29 Results multiple linear regression analyses on environmental civic behaviour

Unstandardized B-coefficients and standard errors

	Environmental civic behaviour (no leadership actions)		Environmental civic behaviour (with leadership actions)	
	weighted	**unweighted**	**weighted**	**unweighted**
Constant	0.735** (0.229)	0.790** (0.235)	1.860** (0.516)	1.584** (0.485)
Perceived environmental threat	0.331** (0.062)	0.316** (0.065)	0.274* (0.128)	0.334** (0.121)
Groningen	0.190 (0.274)	0.176 (0.277)	-1.060 (0.663)	-0.687 (0.645)
Interaction	-0.063 (0.075)	-0.063 (0.078)	0.285 (0.167)	0.196 (0.164)
R^2 [a]	0.192**	0.169**	0.095**	0.092**
N	286	286	274	273

[a] Significant R^2 values indicate total significance of the model

* Significant with p<0.05 ** Significant with p<0.01

The differences between the groups on environmental civic behaviour actions threat are bigger than the differences between the groups for gender, occupational status and political orientation. This suggests that the differences in environmental civic behaviour between these groups is not solely caused by the differences in these socio-demographic variables.

The fifth hypothesis, the difference between participatory actions and leadership actions can be explained by place disruption, place identity and perceived environmental threat, can only partially be adopted. The extent to which someone participates in environmental civic behaviour depends on to which extent someone perceives climate change as a threat. The respondents from the province of Groningen scored significantly lower on this than the people outside from Groningen. This research did not find any evidence that place disruption is a significant factor that determines someone participation in environmental civic behaviour.

5.4 Results

H1 = Place identity has a positive correlation with perceived place disruption.

The correlation coefficient for place identity and perceived place disruption is has a moderate to strong strength. The substantiative regression analyses support this finding. Therefore, hypothesis 1 is adopted.

H2 = Place disruption has a positive correlation with environmental civic behaviour.

The nonparametrical tests showed significant positive coefficients for place disruption and its sub variable perceived place disruption to both participatory- and leadership actions.

The coefficients were all below 0.3, which means that the correlation between place disruption and environmental civic behaviour is weak. This is also supported by the substantiative regression analyses, which show low explanatory values of the simple regression models and low coefficients from place disruption. Hypothesis 2 is confirmed, however the correlation between place disruption and environmental civic behaviour is weak.

H3 = Perceived environmental threat has a positive correlation with environmental civic behaviour.

The results of the nonparametric correlation tests, show weak to strong positive correlation coefficients between perceived environmental treat and both participatory- and leadership actions. The substantiative regression analyses show that perceived environmental threat explains some significant variance in environmental civic behaviour, especially when compared to the influence from place disruption. Hypothesis 3 is adopted.

H4 = Perceived environmental threat has a positive effect on the correlation between place disruption and environmental civic behaviour.

The models created to test this hypothesis do only explain a small variance of participatory actions and the chance of partaking in leadership actions. The most important variable in those models is perceived environmental threat. The effect of perceived environmental threat to participatory actions is positively influenced by perceived place disruption. This is not the case with main variable place disruption and sub variable physical place disruption, all though the extra explanatory value of this model is negligible compared to the model without perceived place disruption. The effect of place disruption, perceived place disruption and physical place disruption on the effect perceived environmental threat has on leadership actions is not significant. Al though simple regression models with place disruption and its sub variables show some significance, this influence from place disruption is not significantly different from 0 when perceived environmental threat is added to these models. Overall, hypothesis 4 could not be adopted considering the findings of this research.

H5 = The differences between the research groups on environmental civic behaviour can be explained by place disruption and perceived environmental threat.

The results from the regression analyses show some explained variance perceived environmental threat. However, there are no significant differences between the research groups when perceived environmental threat was added to the regression analyses. Hypothesis 5 can only partially be adopted, as there is evidence that perceived environmental threat explain the differences in participatory actions and leadership actions, but there is no evidence found that place identity or place disruption play an important role herein.

6. CONCLUSION, DISCUSSION AND RECOMMENDATIONS

6.1 CONCLUSION

The fossil fuel industry is responsible for both local and global problems, but it is unsure if victims of these local problems, like the people living in the earthquake zone in Groningen, also see this link. This research has analysed several potential correlations in order to detect how the people in Groningen link the earthquakes in Groningen caused by the fossil fuel industry to climate change and act on this. This section provides the conclusions of this research with the help of the sub questions and main research question.

The first sub question, *'In what way does place identity influence the perception of place disruption?'*, was answered with the use of the first hypothesis. People who strongly identify with the province of Groningen are more likely to have psychological negative effects caused by the earthquakes in Groningen than people who do not identify with the province of Groningen.

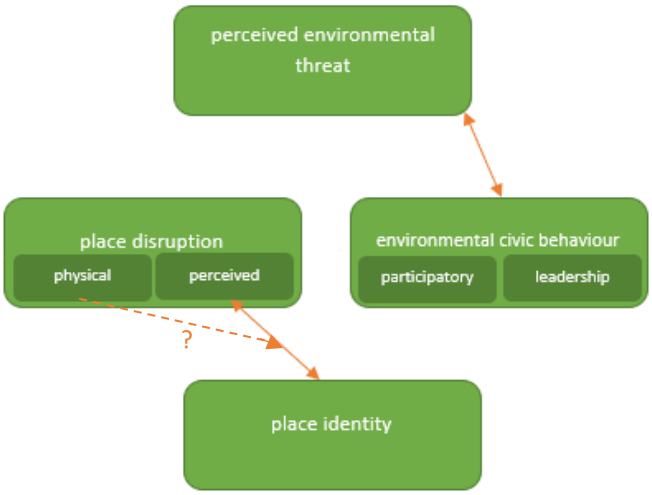
Interestingly, this premise is not true for the respondents who have experienced physical place disruption, for example by living in a damaged house due to the earthquakes. This could mean that the physical place disruption has an effect on the way someone's place identity relates to the way someone perceived the earthquakes. This is somewhat contradicting to what Brown and Perkins (1992) stated about place disruption unveils bonds with a certain place that are otherwise latent. This suggests that physical place disruption has a somewhat negative effect on the identification process with a place. However, this must be researched more carefully, since this occurred with a relatively small population size of 77 respondents, and there are possibly other factors which could clarify this ambiguous way of place identification and perceiving the earthquakes for these people.

The second sub question, *'In what way does place disruption influence the engagement in environmental civic behaviour?'*, can be answered with the help of the findings of the second hypothesis. Overall, the findings showed weak correlations between place disruption and environmental civic behaviour at best. The perception of the place disruption in Groningen showed the best correlations with simple forms of climate change activism, but this was also a weak correlation. For the more complex climate change activism practices, which are called leadership actions, the perception of the place disruption in Groningen had even less influence.

The third sub question, *'In what way does perceived environmental threat influence the engagement in environmental civic behaviour?*' was answered by the use of the third and fourth hypotheses. The way respondents perceive climate change as a threat is a good determinant if these people also participate in climate change activism. Especially simple forms of climate change activism that do not require much skills or talent are determined by the way people perceive climate change as a threat. For the practices that require more skills and talent, perceived environmental threat is still a good determinant, but the influence is a little weaker.

The way people perceive climate change as a threat also influences the weak correlation from perceived place disruption to simple forms of climate change activism. This correlation is not substantial anymore when perceived environmental threat was taken into account. Interestingly, the respondents from Groningen perceive climate change not as much as a threat as the respondents from somewhere else in the Netherlands. Further research is needed to track down why there is this discrepancy of perceived environmental threat within regions.

Figure 9 Revised conceptual model



The last sub question, *'Is there a difference between respondents partaking in participatory and leadership actions and how can that difference be explained?'*, can be answered with mainly the fifth hypothesis, but the results from the other hypotheses substantiate this answer. In sum, the way someone perceives climate change as a threat determines mostly to which extent someone participates in climate change activism. As mentioned before, perceived environmental threat has the most effect on the extent to which someone participates in simple practices of climate change activism, and to lesser extent on more difficult practices.

The main research question, '*To what extent is environmental civic behaviour influenced by place disruption as experienced by the people who have lived in the province of Groningen and do place identity and perceived environmental threat play a role in this?',* is derived from the answers on the sub questions. Since there is no correlation between place disruption and environmental civic behaviour, the answer on this question is simple. Only perceived environmental threat significantly influences the extent to which someone participates in climate change activism. Even though place identity and perceived place disruption correlate strongly, this does not have an effect on environmental civic behaviour, since there is no correlation when perceived environmental threat was taken into account.

What this research did unveil is the difference in the way people from Groningen perceive climate change as a threat compared to people from somewhere else. The reason for this discrepancy between regions has to be researched in further detail.

6.2 Discussion

This research was theoretically driven and contributes to the scientific knowledge on several place related and collective action concepts. In this section, a reflection on the literature is given.

As said before, the statement of Brown and Perkins (1992) on place identity and place disruption is not always true. They stated that place disruption can unveil certain bonds with a place that are otherwise latent. This seemed to be the case for most people of Groningen, as people who strongly identified with Groningen were also more likely to have more psychological problems due to

the earthquakes. However, the respondents who not only have psychological problems due to the earthquakes, but live in damaged houses or have lost money due to the earthquakes, for example, they do not have a strong place identity to Groningen per se. For these people, place identity and the physiological problems due to the earthquakes do not correlate.

For this research a distinction was made between physical and psychological consequences from the earthquakes in Groningen. This made it visible that place identity manifests differently for the people who faced the physical consequences of the earthquakes in Groningen. However, this distinction does not mean that the people who experienced physical place disruption have it worse than the people who only face the psychological consequences. Moreover, it shows that the negative effects of the earthquakes in Groningen affect more people than just the people who live in damaged houses. People who feel connected to the province of Groningen are more likely to face psychological problems due to the earthquakes. This is in line with the literature (Brown & Perkins, 1992; Fried, 2000; Fullilove, 1996).

Lubell (2002), Baldassare & Katz (1992) and Armstrong & Stedman (2019) stated that perceived environmental threat is an important determinant for environmental civic behaviour. This was also found in this study. Even though these scholars did not provide a specific operationalisation of what they understood with the concept, the way it was operationalised in this study captured seemed to have captured what these scholars meant by the concept.

Perceived environmental threat was measured as the perception someone has for specific climate change related disasters happening in the coming 50 years and 2 more general questions on the extent someone worries about climate change. Some of the indicators of this concept were about the extent someone expects the event to happen in their own lives in the next 50 years. Because of the way this question was formulated like this, it was expected that younger people scored higher on perceived environmental threat than older people, simply because they expect to live in the coming 50 years. However, when a correction was made for age, the scores for perceived environmental threat were higher amongst the control group and somewhat the same for the main research group. So, it is not per se the case that younger people score higher on perceived environmental threat.

The environmental action scale was created in order to evaluate several programs from non-governmental organisations. However, it was also useful to test the effects of the extent of environmental civic behaviour and compare groups on this variable. However, some guidelines on how to rank the different indicators and how to evaluate the main variable environmental civic behaviour would have been helpful. Alisat & Riemer described the environmental action scale as a scale, but did not provide with any information on what the extremes of this scale are. Therefore, this research used the indicators from the environmental scale to indicate the extent to which people partook in participatory- and/or leadership actions. However, combining these values was a challenge, especially since more than half of the research population did not attend in any leadership actions. At the end, Alisat & Riemer's expertise was useful for this research, but a guideline on how to rank environmental civic behaviour would have been helpful.

Several socio-demographic variables were said to have an influence on climate change activism (Lubell, 2002; Mohai, 1985). However, this research produced contradicting results for age, since the overall score for perceived environmental threat and environmental civic behaviour where higher amongst the corrected population. Since the population was in general more politically left-

wing and progressive, and high educated, it is unclear to see what the effect of that was. However, the groups had little differences for these socio-demographic variables, as well as for gender, but the discrepancies in perceived environmental threat and environmental civic behaviour were probably not caused by the differences in socio-demographic variables. The differences in socio-demographic variables were namely smaller than the differences in perceived environmental threat and environmental civic behaviour.

Three things that were not included in the research were the influence of social capital (Mohai, 1985), the four key beliefs about climate change from Roser-Renouf et. al (2014) and the general attitude towards activism. It is unclear if people who have experienced some form of place disruption who have good social capital, believe in all four key beliefs of climate change and have a positive attitude towards activism are more likely to participate more in climate change activism than similar people who have not experienced place disruption caused by the fossil fuel industry. Further research is needed to find that out, but in this research there were no indications for that.

A local problem mobilises people to act locally, like the people from Groningen did when raising awareness for the earthquakes in Groningen. But when a global problem is linked to a local problem, this link from place disruption to activism seems to disappear. This is also a part of the climate change problem in itself, since the effects are not directly visible and the people may be used to the causes of climate change, which does not help mobilizing people for environmental civic behaviour. Since the people from Groningen scored lower on perceived environmental threat and did not participate as much in environmental civic behaviour than the people outside from Groningen, this suggests that people are not aware that there is not a link between the earthquakes in Groningen and climate change. This needs to be researched in more detail.

6.3 Limitations of this research

A reflection must be made on certain issued this research faced. First, the respondents for this research were more politically left-wing and progressive orientated, younger and higher educated than the general Dutch public. This made generalisations for the whole Dutch possible not possible. Therefore, the findings of this study are only generalisable for the specific group of people which were part of the survey. Besides that, this study is useful to see in what way the concepts which were used for this study manifest for this group of people.

Second, regarding the internal validity of the research, there is no 100% guarantee that every respondent completely understood every question in the survey. There were only reports on one question, but it remains unsure if every other question was understood completely.

Lastly, some concepts would have been useful to add to the research, namely: attitude towards activism, social capital, key beliefs about climate change and awareness about the link between the earthquakes in Groningen and climate change. If it was clear about the respondents what their general attitude towards activism was, the research and the control group could have been compared to each other on this concept. Besides that, it would have been helpful to see to what extent the people from Groningen were activists regarding the earthquakes in Groningen and to compare that to their environmental civic behaviour. Social capital (Mohai, 1985) and key beliefs towards climate change (Roser-Renouf et. al, 2014) were said to determine environmental civic behaviour to

some extent, which could have been useful to test for in this study as well. This study investigated to what extent people in Groningen were participating in environmental civic behaviour, and it did not find any evidence of a link between the earthquakes and climate change activism. A question in the survey on to what extent people perceived a link between the gas drillings and climate change could have been helpful.

6.4 Recommendations for further research

For further research, it would be a good idea to consider the before mentioned limitations of this research. Besides that, there are three suggestions for further research.

First, it would be interesting to track down why the people who were physically affected by the earthquakes in Groningen did have no correlation between place identity and perceived place disruption. Especially since Brown & Perkins (1992) suggested that place disruption could unveil bonds with a place that are otherwise latent, but this finding contradicts that.

Second, there is a discrepancy between the perceived environmental threat between the people from Groningen and the other respondents. This is also the only indication for the difference in environmental civic behaviour between the respondents. It would be interesting to detect the reason for this difference.

Lastly, more research is needed to pinpoint what the effect of scales is in the perception of problems and the willingness to act on that. This correlates with if people were aware of the fact that the earthquakes in Groningen and climate change have a shared cause. This thesis did not find a link between place disruption and environmental civic behaviour. This may have been caused due to the fact that people were not aware of the link between the earthquakes in Groningen and climate change. But to conclude this, this must be investigated more carefully.

6.4 Recommendations for organisations

This research made clear that the people in Groningen were very much affected by the earthquakes. The people who faced physical damage on their houses, for example, even showed a different way of place identity than the other people who live in Groningen. It also showed that people who did not face physical place disruption, met psychological trauma. This must be taken seriously by the policymakers who handle the case of 'Groningen'.

Although the guide on how to use the Environmental Action Scale was missing, this tool could still be useful for non-governmental organisations and grassroots in order to detect the effectiveness of their policy to mobilise people for climate change activism, which is why Alisat & Riemer (2015) created the scale.

Even though it is unclear on what the reason is that the people from Groningen score lower on perceived environmental threat and environmental civic behaviour, one of the reasons may be that these people were not aware of the link between the earthquakes and climate change. Therefore, it could be helpful if policymakers put more effort in informing people about this.

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V APPENDICES

A. SURVEY - DUTCH

Welkom,

Deze enquête dient als basis voor mijn afstudeeronderzoek voor de opleiding Environment & Society Studies van de Radboud Universiteit in Nijmegen. Het onderzoek gaat over klimaatengagement in Nederland. Ik vertel u geen extra informatie over het onderzoek, zodat u ongekleurd antwoorden kunt geven op de vragen.

Er zijn geen foute of goede antwoorden mogelijk. Het onderzoek duurt ongeveer 5 tot 10 minuten. Alle persoonlijke informatie wordt vertrouwelijk behandeld en anoniem verwerkt. De antwoorden worden uitsluitend gebruikt voor onderzoeksdoeleinden.

Uw antwoorden worden na het onderzoek vernietigd en zijn daarmee niet toegankelijk voor andere onderzoeken.

U kunt deze vragenlijst invullen tot **25 juni.**

Alvast hartelijk dank voor uw deelname!

Lisa Busink,

Student Environment & Society Studies aan de Radboud Universiteit.

Geef hieronder toestemming om uw antwoorden te gebruiken voor onderzoeksdoeleinden. Klik daarna op de pijl rechtsonder om de vragenlijst te starten.

'Ik verklaar hierbij voor mij duidelijke wijze te zijn ingelicht over de aard en methode van het onderzoek. Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik behoud daarbij het recht deze instemming weer in te trekken zonder dat ik daarvoor een reden hoef op te geven. Ik besef dat ik op elk moment mag stoppen met het onderzoek. Als mijn onderzoeksresultaten worden gebruikt in wetenschappelijke publicaties, of een andere manier openbaar worden gemaakt, dan zal dit volledig geanonimiseerd gebeuren. Mijn persoonsgegevens worden niet door derden ingezien zonder mijn uitdrukkelijke toestemming. Als ik meer informatie wil, nu of in de toekomst, dan kan ik me wenden tot Lisa Busink (lisa.busink@student.ru.nl)'

Ik begrijp bovenstaande tekst en ga akkoord met deelname aan het onderzoek.

- o Ja, ik geef toestemming om mijn antwoorden te gebruiken voor onderzoeksdoeleinden (1)

End of Block: Block 2

Start of Block: Default Question Block

Q2 In welke mate bent u het eens met de volgende stelling: klimaatverandering wordt mede veroorzaakt door de mens

- Absoluut eens (1)
- Vooral eens (2)
- Vooral oneens (4)
- Absoluut oneens (3)

Q4 Woont u nu in de provincie Groningen of heeft u er ooit gewoond?

- Ja, en ik woon er nu nog steeds (1)
- Ja, maar nu niet meer (2)
- Nee, nooit (3)

End of Block: Default Question Block

Start of Block: Place identity Groningers

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q7 Hoelang woont u al in de provincie Groningen of heeft u in de provincie Groningen gewoond?

- Minder dan een jaar (1)
- Tussen 1 en 10 jaar (2)
- Tussen 11 en 20 jaar (3)
- 21 jaar of langer (4)

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q9 Geef aan per stelling aan in welke mate u het ermee eens bent

	Oneens (1)	Deels oneens (2)	Neutraal (3)	Deels eens (4)	Eens (5)
Ik voel me een Groninger (1)	○	○	○	○	○
De provincie Groningen is onderdeel van mijn identiteit (2)	○	○	○	○	○
Als iemand vraagt waar ik vandaan kom, benoem ik altijd dat ik in Groningen heb gewoond of nog steeds woon. (3)	○	○	○	○	○

End of Block: Place identity Groningers

Start of Block: Place disruption Groningers

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q11 Geef aan welke zaken er bij jou van toepassing zijn

- Mijn koopwoning in Groningen is in waarde gedaald door de aardbevingen in Groningen (1)
- Mijn woning (koop of huur) is beschadigd door de aardbevingen in Groningen (2)
- Ik woon in aardbevingsgebied (3)
- Geen van de bovengenoemde zaken is op mij van toepassing (4)

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q14 Geef aan per stelling aan in welke mate u het ermee eens bent Met 'de aardbevingen in Groningen' wordt ook gerefereerd naar de gasboringen en het overheidsbeleid op gas en de aardbevingen.

	Oneens (1)	Deels oneens (2)	Neutraal (3)	Deels eens (4)	Eens (5)
De aardbevingen in Groningen voelen als een deuk in mijn identiteit (1)	○	○	○	○	○
Ik heb psychische klachten, zoals stress, depressie of slapeloosheid, door de aardbevingen in Groningen (2)	○	○	○	○	○
Ik ben verdrietig door de aardbevingen in Groningen (3)	○	○	○	○	○
De aardbevingen in Groningen boeien mij niet (4)	○	○	○	○	○

End of Block: Place disruption Groningers

Start of Block: Place disruption niet-groningers

Display This Question:

If Q4 = Nee, nooit

Q12 Geef aan welke zaken er bij jou van toepassing zijn

- Mijn koopwoning is in waarde gedaald als gevolg van de uitbreiding/komst van een nabijgelegen vliegveld (1)
- Mijn koopwoning is in waarde gedaald als gevolg de degradatie van natuur in de directe omgeving van mijn woning (2)
- Mijn koopwoning is in waarde gedaald door vergelijkbare ontwikkelingen in de omgeving van mijn huis (3)
- Mijn woning (koop of huur) is ernstig beschadigd door natuurlijke of economische activiteit die je in verband kunt brengen met aan klimaatverandering (5)
- Geen van de bovenstaande zaken is op mij van toepassing (4)

End of Block: Place disruption niet-groningers

Start of Block: Perceived environmental threat

Q13 Geef aan in welke mate u het eens bent met de volgende stellingen

	Oneens (1)	Deels oneens (2)	Neu-traal (3)	Deels eens (4)	Eens (5)
Ik ben bang voor de gevolgen van klimaatverandering die effect hebben op mijn eigen leven (1)	○	○	○	○	○
Ik maak me zorgen om de gevolgen van klimaatverandering die niet direct effect op mijn eigen leven hebben (2)	○	○	○	○	○

Q15 Geef aan in hoeverre u verwacht dat elk van de volgende zaken in komende 50 jaar gaat gebeuren

	Erg onwaar-schijnlijk (1)	Enigs-zins onwaar-schijnlijk (2)	Neutraal (3)	Enigs-zins waar-schijnlijk (4)	Erg waar-schijnlijk (5)
Een aanzienlijk deel van Nederland overstroomt (1)	○	○	○	○	○
Klimaatverandering veroorzaakt een toename in voedseltekorten en honger (2)	○	○	○	○	○
Honger en voedseltekorten vinden plaats in Nederland door klimaatverandering (3)	○	○	○	○	○
Klimaatverandering veroorzaakt een ziekte epidemie (4)	○	○	○	○	○
Je lijdt aan de ziekte die door klimaatverandering is veroorzaakt (5)	○	○	○	○	○
Jouw levenskwaliteit gaat erop achteruit door klimaatverandering en de gevolgen daarvan (7)	○	○	○	○	○
De levenskwaliteit van de gemiddelde Nederlander gaat erop achteruit door klimaatverandering (8)	○	○	○	○	○
De levenskwaliteit van de gemiddelde aardbewoner (mens en dier) gaat er op achteruit door klimaatverandering (9)	○	○	○	○	○
Rijkere landen moeten grote financiële ondersteuning bieden aan armere landen door klimaatverandering (10)	○	○	○	○	○

End of Block: Perceived environmental threat

Start of Block: Environmental Civic Behaviour

Q16 In de afgelopen 6 maanden, met welke frequentie heeft u deelgenomen aan de volgende zaken?

	Nooit (1)	Zelden (2)	Soms (3)	Vaak (4)	Heel vaak (5)
Mezelf geïnformeerd over klimaatverandering (1)	○	○	○	○	○
Deelgenomen aan een informatief evenement over klimaatverandering (2)	○	○	○	○	○
Met anderen over klimaatverandering gepraat (3)	○	○	○	○	○
Social media gebruikt om meer aandacht te generen over klimaatverandering (4)	○	○	○	○	○
Vrijwilliger/stagiair/medewerker geworden van een milieu-organisatie of politieke partij om klimaatverandering tegen te gaan (5)	○	○	○	○	○
Geld gedoneerd aan een goed doel gerelateerd aan klimaatverandering (6)	○	○	○	○	○
Bepaalde taken niet op je genomen en/of afspraken niet aangegaan of juist afgezegd zodat je tijd kon investeren in het tegengaan van klimaatverandering (bijvoorbeeld door parttime te gaan werken zodat je meer vrijwilligerswerk kunt doen of ontspannende activiteiten afgezegd zodat je mee kon doen met een protest) (7)	○	○	○	○	○
Deelgenomen aan een evenement dat gericht was op het generen van meer aandacht op klimaatverandering (8)	○	○	○	○	○
Aan activiteiten deelgenomen zoals het planten van bomen (9)	○	○	○	○	○
Bij een groep/organisatie gewerkt die aandacht besteedt aan het de connectie tussen klimaatverandering en andere sociale kwesties zoals rechtvaardigheid en armoede (10)	○	○	○	○	○
Een petitie aangaande klimaatverandering ondertekend (11)	○	○	○	○	○

Q34 In de afgelopen 6 maanden, met welke frequentie heft u deelgenomen aan de volgende zaken?

	Nooit (1)	Zelden (2)	Soms (3)	Vaak (4)	Heel vaak (5)
Bewust minder geconsumeerd, omdat dit beter is voor onder andere het klimaat (1)	○	○	○	○	○
Specifiek voedsel gaan eten, omdat dit beter is voor onder andere het klimaat (2)	○	○	○	○	○
Een evenement georganiseerd om aandacht te vestigen op klimaatverandering (3)	○	○	○	○	○
Een petitie gestart aangaande klimaatverandering (4)	○	○	○	○	○
Een boycot georganiseerd tegen een bedrijf die klimaatverandering medeveroorzaakt (5)	○	○	○	○	○
Meegedaan met een demonstratie/protest over klimaatverandering (6)	○	○	○	○	○
Een politicus, staatssecretaris of minister gecontacteerd om aandacht te vestigen op klimaatverandering (7)	○	○	○	○	○
Een (opinie)artikel geschreven voor een krant of website om meer aandacht te genereren aan klimaatverandering (8)	○	○	○	○	○
Een informatief evenement gerelateerd aan klimaatverandering georganiseerd (9)	○	○	○	○	○

End of Block: Environmental Civic Behaviour

Start of Block: Block 2

Q30 ‘De enquête is bijna voorbij. De volgende vragen stel ik alleen zodat ik in mijn onderzoek een uitspraak kan doe over de representativiteit van het onderzoek. Ik doe géén onderzoek naar de samenhang van één van de volgende onderwerpen met klimaatengagement’

Q17 Wat is uw geboortejaar?

[GEBOORTEJAAR]

Q18 Wat is uw geslacht?

- Vrouwelijk (1)
- Mannelijk (2)
- Anders (3)

Q19 Wat is uw hoogst behaalde diploma?

- Geen/onvolledige basisschool (1)
- Basisschool (2)
- Middelbare school (3)
- MBO niveau 1,2, 3, en/of 4 (4)
- Hbo of wo- bachelor (5)
- Hbo of wo- master (6)
- PHD of hoger (7)
- Anders (8)
- Beantwoord ik liever niet (9)

Q20 Wat is op u van toepassing? (Meerdere antwoorden mogelijk)

- Ik ben werkloos (1)
- Ik heb een arbeidsbeperking/ziek (7)
- Ik ben huisvader/moeder (2)
- Ik werk parttime (3)
- Ik werk fulltime (4)
- Ik ben student aan een voltijd opleiding (5)
- Ik ben student aan een deeltijd opleiding (8)
- Gepensioneerd (9)
- Anders: (6) _____

Q21 Hoe is uw politieke voorkeur het beste te omschrijven? (Meerdere antwoorden mogelijk)

- Links (1)
- Rechts (2)
- Progressief (3)
- Conservatief (4)
- Liberaal (5)
- Socialistisch (6)
- Communistisch (7)
- Nationalistisch (8)
- Weet ik niet/wil ik geen antwoord op geven (9)
- Anders, namelijk (10) _____

Q32 Heeft u verder nog vragen of opmerkingen die u met me wilt delen?

_____

Q33 Hartstikke bedankt voor het invullen van mijn enquête! Bent u benieuwd naar de resultaten van het onderzoek? Dan kunt u me dat laten weten door te mailen naar lisa.busink@student.ru.nl

B. SURVEY - ENGLISH

Welcome,

This survey serves as the basis for my masterthesis. I'm studying Environment & Society Studies at Radboud University in Nijmegen. This research is about environmental civic behaviour in the Netherlands. I will not tell you any additional information about the research, so this allows you to give unbiased questions.

There are no wrong answers, as long as you answer to your true beliefs. The survey takes approximately 5 to 10 minutes. All personal information is treated confidentially and processed anonymously. The answers are only used for research purposes. Your answers will be destroyed after this research project and will therefore not be accessible for other projects.

You can complete this questionnaire until **June the 25th**.

Thank you in advance for your participation!

Lisa Busink, Student Environment & Society Studies at Radboud University.

Please give permission below to use your answers for research purposes. Then click on the arrow in the lower right to start the questionnaire.

'I hereby declare that I have been clearly informed about the nature and method of this research. I voluntarily agree to participate in this study. I thereby retain the right to withdraw this consent without having to give a reason. I realize that I can stop the investigation at any time. If my research results are used in scientific publications, or are made public in any other way, then this will be completely anonymous. My personal data is not viewed by third parties without my explicit permission. If I want more information, now or in the future, I can turn to Lisa Busink (lisa.busink@student.ru.nl).'

I understand the above text and agree to participate in the study

- Yes, I give permission to use my answers for research purposes (1)

End of Block: Block 2

Start of Block: Default Question Block

Q2 Do you believe that climate change is also caused by people and their actions?

- Absolutely agree (1)
- Mostly agree (2)
- Mostly disagree (4)
- Absolutely disagree (3)

Q4 Do you live in the province of Groningen or did you ever live there?

- Yes, and I still live there (1)
- Yes, but not anymore (2)
- No, never (3)

End of Block: Default Question Block

Start of Block: Place identity Groningers

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q7 How long have you been living in the province of Groningen or were you living there?

- Less than a year (1)
- Between 1 and 10 years (2)
- Between 11 and 20 years (3)
- 21 years or longer (4)

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q9 Please, state to which extent you agree on the following statements

	Dis-agree (1)	Partly dis-agree (2)	Neutral (3)	Partly agree (4)	Agree (5)
I identify myself as a Groninger (1)	○	○	○	○	○
The province of Groningen has become a part of my identity (2)	○	○	○	○	○
Whenever someone asks where I come from, I always mention that I live(d) in Groningen (3)	○	○	○	○	○

End of Block: Place identity Groningers

Start of Block: Place disruption Groningers

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q11 Please, indicate which matters apply to you

- The residence which I bought in Groningen has fallen in value due to the earthquakes in Groningen (1)
- My residence (bought or rented) has been damaged by the earthquakes in Groningen (2)
- I live(d) in the earthquake zone in Groningen (3)
- None of the aforementioned issues apply to me (4)

Display This Question:

If Q4 = Ja, en ik woon er nu nog steeds

Or Q4 = Ja, maar nu niet meer

Q14 Please, state to which extent you agree on the following statements 'The earthquakes in Groningen' also refers to the gas drillings and the government policy to those, the earthquakes and the damage handling

	Disagree (1)	Partly disagree (2)	Neutral (3)	Partly agree (4)	Agree (5)
The earthquakes in Groningen feel like a dent in my identity (1)	○	○	○	○	○
I have psychological complaints, suchs as stress, spression or insomnia, due to the earthquakes in Gronignen (2)	○	○	○	○	○
I am saddened by the earthquakes in Groningen (3)	○	○	○	○	○
The earthquakes in Groningen do not interest me (4)	○	○	○	○	○

End of Block: Place disruption Groningers

Start of Block: Place disruption niet-groningers

Display This Question:

If Q4 = Nee, nooit

Q12 Please, Indicate which matters apply to you

- The residence which I bought has fallen in value due to the extensions or arrival of a nearby airport (1)
- The residence which I bought has fallen in value due to the degradation of nature near my house (2)
- The residence which I bought has fallen in value due to similar developments near my house (3)
- My residence (bought or rented) is damaged due to natural or economic activities which can be linked to climate change (5)
- None of the aforementioned issues apply to me (4)

End of Block: Place disruption niet-groningers

Start of Block: Perceived environmental threat

Q13 Please, state to which extent you agree on the following statements

	Disagree (1)	Partly disagree (2)	Neutral (3)	Partly agree (4)	Agree (5)
I am afraid of the effects of climate change that affect my own life (1)	○	○	○	○	○
I am concerned about the effects of climate change that do not have a direct effect on my own life (2)	○	○	○	○	○

Q15 Please, indicate to which extent you expect the following matters to happen in the coming 50 years

	Very unlikely (1)	Somew hat unlikely (2)	Neutral (3)	Somew hat likely (4)	Very likely (5)
A substantial part of the Netherlands is flooded (1)	○	○	○	○	○
Climate change causes an increase in food shortages and hunger in the world (2)	○	○	○	○	○
Hunger and food shortages occur in the Netherlands due to climate change (3)	○	○	○	○	○
Climate change will cause a disease epidemic (4)	○	○	○	○	○
You suffer from the disease caused by climate change (5)	○	○	○	○	○
Your quality of life is deteriorating due to climate change and its consequences (7)	○	○	○	○	○
The quality of life of the average Dutch person is deteriorating due to climate change (8)	○	○	○	○	○
The quality of life of the average Earth inhabitant (human and animals) is deteriorating due to climate change (9)	○	○	○	○	○
Richer countries must offer major financial support to poorer countries due to climate change (10)	○	○	○	○	○

End of Block: Perceived environmental threat

Start of Block: Environmental Civic Behaviour

Q16 In the past 6 months, with what frequency did you participate in the following matters?

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Very often (5)
Informed myself about climate change (1)	○	○	○	○	○
Participated in an educational event about climate change (2)	○	○	○	○	○
Talked with others about climate change (3)	○	○	○	○	○
Used social media to raise awareness about climate change (4)	○	○	○	○	○
Became involved with an environmental group or political party as volunteer, intern, employee in order to combat climate change (5)	○	○	○	○	○
Financially supported an climate cause (6)	○	○	○	○	○
Consciously made time to be able to work on environmental issues (e.g., working part time to allow time for environmental pursuits, working in an environmental job, or choosing environmental activities over other leisure activities) (7)	○	○	○	○	○
Participated in a event which focused on awareness on climate change (8)	○	○	○	○	○
Participated in nature conservation efforts (e.g. planting trees) (9)	○	○	○	○	○
Spent time working with a group/organization that deals with the connection of the environment to other societal issues such as justice or poverty (10)	○	○	○	○	○
Signed a petition related to combatting climate change (11)	○	○	○	○	○

Q34 In the past 6 months, with what frequency did you participate in the following matters?

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Very often (5)
Made a decision to reduce my consumption of material goods by buying less (1)	○	○	○	○	○
Made environmentally conscious food choices (2)	○	○	○	○	○
Organized an event related to climate change (3)	○	○	○	○	○
Started a petition related to climate change (4)	○	○	○	○	○
Organized a boycott against a company engaging in causing climate change (5)	○	○	○	○	○
Took part in a protest/rally about climate change (6)	○	○	○	○	○
Personally contacted a politician/government official about climate change (7)	○	○	○	○	○
Wrote an opinionpiece for a newspaper of website to raise awareness about climate change (8)	○	○	○	○	○
Organized an educational event related to climate change (9)	○	○	○	○	○

End of Block: Environmental Civic Behaviour

START OF BLOCK 2

Q30: 'The survey is almost over. I only ask the following questions so that I can make a statement in my research about the representativeness of the research. I will not analyze the coherence of one of the following topics with climate engagement.'

Q17 What is your year of birth?

[YEAR OF BIRTH]

Q18 What is your sex?

- ○ Female (1)
- ○ Male (2)
- ○ Other (3)

Q19 What is your highest educational degree?

- Non/incomplete primary school (1)
- Primary school (2)
- High school (middelbare school in The Netherlands) (3)
- MBO (4)
- Bachelor op (applied) science/arts (5)
- Master of (apllied) science/arts (6)
- PHD or higher (7)
- Other (8)
- I do not want to answer this (9)

Q20 What is your current sate of employment? (multiple answers possible)

- Unemployed (1)
- Incapacity forwork (7)
- I'm taking care of the household (2)
- Parttime employed (3)
- Fulltime employed (4)
- Fulltime student (5)
- Parttime student (8)
- Gepensioneerd (9)
- Other: (6) _____

Q21 How would you like to describe your political preference? (more answers possible)

- Leftwing (1)
- Rightwing (2)
- Progressive (3)
- Conservative (4)
- Liberal (5)
- Socialist (6)
- Communist (7)
- Nationalist (8)
- I don't know/I don't want to answer (9)
- Other, namely: (10) _____

Q32 Do you have any more notes or questions you want to adress to me?

_____

Q33: Thank you very much for completing my survey! Are you curious about the results of the research? You can let me know by writing me via lisa.busink@student.ru.nl