

Social Capital Influence on Climate Change Mitigation Policies

A quantitative study on how social capital and risk perceptions influence public attitudes towards climate change policies

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Abstract

For successful government implementation of climate change mitigation policies, public support is necessary to make these policies as effective as possible. Climate change requires collective action to reduce greenhouse gases currently emitted. Two factors have been suggested to have an important influence on support for policy implementation and climate policies: social capital, and risk perception. Social capital has been conceptualized into four categories, social trust, institutional trust, formal social networks, and informal social networks. Using data from the European Social Survey (2016), the study explores public support for climate change mitigation policies and whether they are associated with social capital and climate change risk perception. The study found that social trust, institutional trust, formal social networks, and climate change risk perception were positively linked with support for different types of climate policies, such as taxes, subsidies, and bans. Both social trust and formal social networks are suggested to have possible moderating effects on the relationship between climate change risk perception and support for climate policies. This study demonstrates the importance of acknowledging the social dimensions within societies and the influence of risk awareness when it comes to understanding the support for climate change policy implementation.

Key words: Climate change, mitigation, social capital, risk perception, multiple regression

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1 Introduction

The challenges of climate change are becoming more urgent, and it is necessary to have effective policies to manage the potential impact it could have. There are different reasons why environmental policies have been lacking. One significant factor for shaping climate policies is the public attitudes towards climate change and their willingness to implement climate policies (Jones & Clark, 2013; Adger, 2010; Edenhofer et al., 2015). Regions around the world are experiencing adverse effects of climate change with recording rising temperature levels and more extreme weather while failing to mitigate its impact (Cronin et al., 2018). It is currently one of the most crucial global challenges. To avoid further human interference with the environmental system there needs to be a significant reduction of greenhouse gas emissions in the future (Caferra et al., 2021. 1). This means that there is a need for a change in the way energy is used and produced. To achieve this, decarbonization of energy is necessary which requires behavioral change, new low-carbon energy technologies, and facilities with new policies and regulations (Poortinga et al., 2018. 2). It has become more important to establish secure supplies of energy, especially with the increasing internationalization of energy markets, rising energy use, and dependence on fossil fuels (World Energy Council, 2013). Collective action and climate mitigation policies for changing energy consumption will therefore be necessary to reduce greenhouse gas emissions and minimize the risks that climate change could potentially have which will also be the focus of the study.

Climate change must be understood as a large-scale collective action problem. Private consumers and businesses will not reduce their emissions voluntarily as it would not be profitable (Dietz et al., 2009. 3). The state has therefore an important role as it most often responsible for collective action problems (Mansbridge, 2014. 8). To be able to implement climate actions, the state needs to implement policies to encourage different actors, including private consumers and industries to change their behavior. To make these measures possible public support is necessary. Politicians and policymakers will be hesitant with implementing measures if the public disagrees with the adjustments (Tompkins et al., 2010). The public perceptions of climate change policies have shown crucial influence (Poortinga et al., 2019; Lorenzoni et al., 2006; Marquart-Pyatt, 2019; McCright et al., 2016) and therefore important to investigate further. Public acceptability is predicted to improve the effectiveness of

strategies for implementing climate change policies (Adger et al. 2017). This study will therefore consider the political discourse that environmental policies are within, discuss issues of political legitimacy related to climate change action and provide a more in-depth understanding of public engagement. Recent trends have illustrated that although environmental issues have been receiving more attention in academic research (Van der Linden, 2017; Echaverren, 2019; Adger, 2010; Basset & Fogelman, 2012). Public attention has been declining. There are only short-term shifts of concern for a few years with more intensive media coverage for a short period influenced by weather or political events that only provides a temporal increase in concern (Ratter & von Storch, 2012)

Social factors have been identified as one crucial factor for collective actions and environmental behaviors. Social dimensions have been predicted to have a significant influence on climate mitigation attitudes (Adger et al., 2009; Aldrich et al., 2016, Pelling & High, 2005). The capacity of mitigation is shaped by the public's everyday activities where certain behaviors are adopted and public engagement will provide a platform for environmental policies being effectively implemented and followed (Pelling & High, 2005). Social dimensions have been examined in various ways, however, one of the most popular concepts used to understand the social dimensions is social capital. This paper will use the theoretical framework of the social capital which is theorized to operate as a mechanism that facilitates the community's functioning (Jones & Clark, 2013. 13). Research has demonstrated a positive relationship between social capital and policy implementation and suggests that social capital is necessary for accomplishing more effective policy implementation (Adger et al., 2009; Jones & Clark, 2013).

The most important aspects of social capital will be examined, social trust, institutional trust, and social networks (Putman et al., 1993. 167). Trust between individuals and institutions has been decreasing in countries with increased polarization, especially in Europe (Mair, 2013; Algan et al., 2017). This has led to increased distrust for implemented policies with climate change being one of these issues (Lipps & Schraff, 2020). It is necessary to find new ways to understand people's risk perception of climate change and their willingness to implement mitigation policies. The public influence on policy implementation needs to be recognized as a vital process in managing climate change. This study will therefore examine the impact of social capital on an individual's willingness to implement environmental mitigation policies. Another factor that is predicted to have an influential effect is risk perception, if the public is more aware of the risk, they will be more likely to mitigate it (Stoutenborough et al., 2015;

Poortinga et al., 2019). This is a relationship that has been researched cross-nationally in different studies (Poortinga et al., 2019; Leiserowitz, 2006). However, a few scholars have considered both risk perceptions and the social dimensions together to comprehend collective action towards climate change. The relationship needs further investigation to be able to understand these patterns. Research has suggested that social factors have moderating effects on the relationship between risk perception and support for climate policies (Rothstein, 2005; Stoutenborough et al., 2015). Meaning that the relationship between these variables is dependent on social dimensions, which in this case will be examined through the concepts of social capital. It is argued that support for collective action problems and climate policies is less likely to occur if there is less trust and smaller social networks, even when the risk is acknowledged. It is predicted that higher social capital will make the relationship between risk perception and support for climate policies stronger. The study will look at climate risk perception both independently and combined as an interaction effect with social capital as a moderator variable.

The study will firstly provide a literature review within the field and the potential gaps within the existing literature. Thereafter, the theoretical framework and conceptualization will be given followed by the descriptions of the methodological approach. The result section will use multiple regression and interaction models to understand the different hypothesized relationships. Lastly, a discussion and conclusion with suggestions for further research will be provided.

1.1 Research aim and questions

The ambition of this study is to understand the influence of social capital, which includes social trust, institutional trust, and social networks, on public support for climate mitigation policies. The risk perception of climate change will also be understood in relation to attitudes towards climate change mitigation to investigate its independent influence. Thereafter, the interaction between the concepts of social capital and climate change risk perception will be examined to understand if social capital has a moderating effect on the relationship between risk perception and support for mitigation policies. The study will look at two different aspects of support for climate change mitigation related to energy consumption, punishing and rewarding forms of policy measures, which will be operationalized as support for taxes and subsidies.

- **Research question 1:** How does social capital influence support for climate change mitigation policies?
- **Research question 2:** How does climate change risk perceptions influence support for climate change mitigation policies?
- **Research question 3:** Does social capital have a moderating effect on the relationship between climate change risk perception and support for climate change mitigation policies?

2 Previous literature

The academic work on climate change and public perception is expanding with literature examining cross-national differences. Previous research has been focusing on different aspects with including various factors into their analysis. Kvaloy et al. (2012) examine the public's concern for global warming. The study uses a value-based approach of public opinion that demonstrates a positive relationship between perception of the seriousness of climate change and high education, post-materialism, and a leftist position on a left-right scale. Van der Linden (2017) studies individual social-psychological models of climate change risk perception by studying socio-cultural and cognitive factors. The results showed that gender, political party, knowledge, social norms, and values were significant predictors. Echavarren et al. (2019) add to this by combining individual level and macro-level indicators related to countries' exposures to natural hazards and national political contexts. The article demonstrates that a few macro-variables could explain climate change perception, both related to natural hazards and political context. Micro-variables on an individual level had more significant effects. Education and political orientation showed the most significant variables with left-leaning individuals demonstrating more support for climate change policies. Most of these factors are well-established within the academic community with many scholars conducting similar studies across different nations (Poortinga et al., 2019; McCright et al., 2016; Milfont et al., 2015).

However, an understanding of the social factors is still lacking where research on the relationship between climate change perceptions and social dimensions has been scarce. Some scholars have been using social relations to explain climate change perception and climate attitudes. Jones and Clark (2013) use social capital to conceptualize social relations and

suggest that higher social capital with a denser social network result in positive community perceptions of proposed policies for coastal management with higher awareness of climate issues. This paper will similarly to Jones and Clark (2013) use a similar conceptual framework. Social capital is categorized into three different sub-categories, social trust, institutional trust, and social network. All these categories demonstrated a positive influence on policy implementation in relation to coastal management policies (Jones & Clark, 2013). Lorenzoni (2007) similarly suggests that public engagement and social networks affect climate change perception on reduction of greenhouse gases in the UK. Low public engagement and social networks will hinder communities to reduce their carbon dependency. It is also suggested that the public will not just be less informed but will also perceive the authorities and their implementation processes as less trustworthy. Wolf et al. (2010) demonstrate how high social capital could contribute to both positive public health outcomes and climate change adaptation. The article analyzes the influence of the social networks and the effects it has on people's responses to heatwave risk in the UK. The study, however, shows different results compared to Jones and Clark (2013) and, Lorenzoni (2007). It determined that strong social networks could potentially worsen climate risk perceptions rather than improve risk awareness. Most respondents thought that heatwaves were not a significant threat and that they will be able to manage the hot weather. Social networks could maintain these narratives and eventually increase vulnerability. The result of this study illustrates a more complex reality, rather than the theorized uniformly positive relationship between social networks and climate change perception. Social capital could enforce problematic norms by connecting people with similarities to a negative cause. This aspect will be necessary to consider continuing with the study.

Adger (2010) argues the importance of understanding the social relation to predict collective actions in relation to climate change. Climate policy implementation is described as a social process, if people are willing and able to act collectively more environmental policies could be implemented more effectively. Understanding the social dimension on a larger scale on a cross-national level is necessary and this study will therefore add to the current literature by examining these social dimensions through social capital. This study will not only examine the relationship between social capital and mitigation policies but also between individual climate change risk perception and support for mitigation policies. Individual risk perception influence over support for environmental policies has been well-studied with different scholars illustrating similar results between the relationship. Climate change risk perception

has been studied extensively, with research demonstrating the importance of risk awareness in relation to environmental policies (Van der Linden, 2017; Leiserowitz, 2006; Stoutenborough et al., 2015). However, the relationship between social capital and risk perception in relation to mitigation policies has been few with a need for further development. Fairbrother (2016) means that both are important for environmental policy implementation, but that public risk perception cannot by itself lead to public willingness to support climate change policies where trust is low. This study will therefore be able to add to the current literature by not only supporting the assumption of the effects of social capital and risk perception on climate change mitigation but also if there is an interaction between these two and the potential moderating effect of social capital. This will provide an important perspective of the social dimension that exists within the development of creating mitigation policies. Another addition is that most of these studies examine general perceptions on climate change rather than specific policies to mitigate climate change. These general perceptions on climate change provide a rather vague understanding of how these attitudes will be transformed into action. Understanding public policy perception related to climate change provides more specific knowledge of what actions could be taken.

3 Theoretical framework and conceptualizations

This section will provide the theoretical framework and conceptualization of the study. Firstly, a general definition of mitigation will be presented, thereafter in relation to public policy. To proceed, the conceptualization of social capital will be provided to then continue to discuss the relationship between social capital and policy implementation to thereafter relate it more specifically to climate policy implementation. The sub-categories of social capital will also be presented and discuss their relationship with climate change mitigation perceptions. The relationship between climate change risk perceptions and climate policy mitigation will thereafter be examined. Lastly, social capital will be discussed as a moderating factor between climate change risk perceptions and support for climate change mitigation policies. This theoretical framework of the different concepts will allow for not only testing the relationships between social capital and climate change mitigation but also the combined effect of social capital and risk perception.

3.1 Mitigation as risk reduction

To continue with this study, an understanding of mitigation and its process is essential. Mitigation should not be understood as an independent concept but instead as an important feature in a process of developing a more resilient society with the ambition to generate sustainable development (Becker, 2014. 48). The overall ambition of mitigation is to contribute to resilience by protecting something that human being's value (ibid, 49). To shortly summarize the definition of resilience, it is that the system can continue to develop along the preferred expected trajectory while remaining within the human and environmental boundaries (ibid, 150). The systems within societies must have the ability to change to continuously develop along the preferred expected trajectory. If not, the society and the system could head in an undesirable direction (Pendall et al., 2010. 79). What should be protected and valued is also subjective. Following Becker's (2014) reasoning, sustainable development and protection of the human and environmental system is what is valued and needs to be protected. Climate change is the potential risk that could harm these systems within society. To be able to manage these issues, proper measures need to be implemented.

Mitigation is also only one important function of adaptation. The adaptation process is usually categorized into two different sections, anticipatory and proactive measures (Coppola, 2014. 209). All of them should be considered when managing different kinds of risks. The anticipatory functions are mitigation, preparedness, and preparation. The reactive measures are responding and recovery (Becker, 2014. 159). The reactive measures are often non-contested and perceived as a measure that needs to be implemented by most (Adger, 2017. 5). Preparedness and prevention are necessary aspects to consider in risk management, but difficult to interpret into climate change risks since it is a long-term process where mitigation is the most common method to manage climate change and is perceived as the most efficient way of reducing the risks (Coppola, 2014. 208), for instance reducing greenhouse emissions. To prepare is possible with e.g., building different forms of protection, however, it will not deal with the actual process of climate change (Becker, 2014. 150). Mitigation measures try to reduce the likelihood or consequences of the risk before the disaster ever occurs. It tries to make the hazard less likely to occur or reduce the negative effects if it were ever to occur (Coppola, 2014. 209). The process of mitigation is an adjustment in systems of humans lives in and a response to observed or expected changes in the climate and to improve adaptive capacity (Smit & Pilifosova, 2003. 881). From a human perspective of global change, mitigation refers to a process or outcome in a system to improve the system to manage stress,

hazards, or risk vulnerability (Tompkins et al. 2005. 78). It is a way to moderate the negative impacts of climate change (ibid, 79). Mitigation will therefore be the focus of the study related to one of the most important mitigation measures, reducing greenhouse gas emissions by changing energy consumption. The following section will discuss the social aspects of mitigation and how they could be related to policy implementation in relation to the importance of public support.

3.2 Mitigation, social discourse, and policy

It is important to understand that mitigation is conventionally assumed and hypothetical. The process is always contested and political, one group might perceive the implemented policy as a part of adaptation while the other perceives it as maladaptation. The political framing and process establish which perceptions are acknowledged as more important and urgent (Eriksen et al., 2015; Adger, 2017). It is, therefore, necessary to understand mitigation as a subjective process inherited through different discourses and not a single decision or measure (Eriksen et al., 2015. 525). It must be considered as a part of the dynamics within societies, and not just as a technical adjustment to physical change (Basset & Fogelman, 2012. 50). To be able to do that social processes need to be understood, both in relation to authorities and other citizens. This is a part of the transformative perspective of environmental adaptation which argues that mitigation must be understood as a social process and through interconnectedness with individuals and authorities (Basset & Fogelman, 2012. 50). This differentiates from the traditional perspective, where the society is viewed as a sum of individuals that is governed by a politically neutral state. It is perceived as a one-way relationship with a controlling state not considering the consent of the public (ibid). This perspective misses the social processes within the mitigation procedures and does not consider the changes in the social dimensions in societies. For effective policy implementation, both the public and the authorities need to be coherent and not just institutions acting without the acceptance of the people (Pelling & High, 2005). A successful synergy between the state and the public will enhance effective policy implementation and collective action (Adger, 2001).

Eriksen et al. (2015) discuss the importance of subjectivity and the necessity of understanding the power dynamics in the social process where environmental subjectivities are constructed in everyday social interactions. Ideas, power, and resources are discussed and conceptualized differently by groups and adaptation responses originate from their knowledge and discourses about climate change (Basset & Fogelman 2012. 50). Policies are conceptualized as

politicization frames actions and policies. It is therefore important to understand the social process of policy implementation and legitimization which will be related to the theoretical framework of social capital (Adger, 2017. 377). The importance of examining public views on climate change risks and the perception of climate action is essential. It has illustrated that the increased effectiveness of strategies for mitigating climate change will depend on people's acceptability (ibid). Emphasizing the political climate on mitigation raises the issues of political legitimacy related to climate change actions and provides a perspective to understand the public engagement (Eriksen et al., 2015). Implementation of public policies by authorities' governments is necessary where market forces are unlikely to lead to efficient climate behavior because they will most often act in relation to what is most profitable (Tompkins et al., 2010. 628-629). Therefore, public policies are needed to support and protect people who are least able to cope by dealing with causes of vulnerability and protect important public good such as the ecosystem and public resources.

As mentioned previously, the risk of climate change is predicted to have severe consequences to natural, social, and economic systems, and is one of the most urgent global challenges (Poortinga et al., 2016. 2). Mitigation processes can take form in different ways, however, one of the most essential ways is to reduce further human interference with a substantial reduction of greenhouse gas emissions (Marquart-Pyatt, 2019. 2). This means that the way energy is produced and used needs to change completely. To succeed with this ambition, behavior change is needed with new low-carbon energy technologies and facilities, policies, and regulations that are only achievable with broad public acceptance (Poortinga et al., 2016. 2). Depending on public perception governments will respond differently to these issues (Mansbridge, 2014, 8-10), it is, therefore, important to understand the attitudes to be able to cope with them. The study will therefore analyze the public perceptions on energy mitigation measures. Governments have different ways of climate policy instruments, such as taxes, fees, subsidies, information, and regulations (Harring, 2016. 575). Davidovic and Harring (2020) argue that people could be pushed in a specific direction or be pulled in another direction. Economic instruments could e.g., be used as punishing (e.g., taxes) or rewarding (e.g., subsidies). Push or punishing is a way to impose more constraints on the behavior and individual freedom than pull instruments. Pull or rewarding is often seen as more effective than push measures in changing the behavior of the public with incentivizing actions (Davidovic & Harring, 2020. 3). Separating and categorizing different instruments of environmental measures is difficult since they usually are similar and implemented as policy

packages (Wicki et al., 2019. 4). Climate tax is for instance an economic and punishing measure, however, it will most often include an infrastructure of other regulation not defined as punishing. It can also be difficult to distinguish between what is punishing and rewarding (Harring, 2016. 575). A policy measure introduced can be perceived differently. Measures that are supposed to be punishing for people with non-environmentally friendly behavior can be seen as rewarding for people already behaving environmentally friendly, because by being environmentally friendly a person will not need to pay, e.g., a climate tax. The study will therefore combine the policy measures of taxes and subsidies into one single variable which will provide a good general understanding of perceptions on climate mitigation policy measures. This theoretical discussion and analysis of the paper will focus on economic and legal policy instruments, and not include informative factors. This is because of the data limitation and because the broader policy discussion between researchers and policy experts is focused on taxes and regulations (Carattini, 2018). The informative aspect is often perceived as complementary tools, it cannot by its own change climate behaviors and consumption patterns (Davidovic & Harring, 2020. 3).

3.3 Social capital

An understanding of the social dimensions of climate is needed and is a field that that should be provided more intention. Social factors have, as mentioned earlier, demonstrated significant influence on the level of adaption and mitigation to climate change (Pelling & High, 2005; Jones & Clark, 2013; Wolf et al., 2010). Researchers have had different approaches to studying social dimensions, however, many scholars have used the broader concept of social capital which has also been linked with environmental behavior (Jones & Clark, 2013). The concept of social capital will allow for examining and explore the social impacts and public policy interventions. Similarly, all theories of social interaction are that they recognize that collective actions need networks and flows of information between individuals and groups to support decision-making. These networks are described as an asset of an individual or a society and more often called social capital (Adger. 2010. 389). Social capital describes how people use their relationships with other actors for their own and the collective good. The concepts of social capital can explain the nature of social relations and the outcomes in society through that (ibid, 390).

The definition of social capital has varied over time and the definition is still contested (Pelling & High, 2005. 283). Putman et al. (1993, 167) provides the most common definition

of social capital and defines it as “features of social organization, such as trust, norms, and networks that can improve the efficacy of society by facilitating coordinated actions”. Social capital is made up of norms and networks that make people able to act collectively (Woolcock & Narayan, 2000. 226). It will be defined as a multi-dimensional concept that includes three cognitive and structural dimensions often examined: social trust, institutional trust, and social networks (Putnam, 2000). All these factors have a certain influence on natural management and public acceptability of climate policies (Jones & Clark, 2013. 134). It provides a role to civil society and collective action for both instrumental and democratic reasons. In most recent studies, specifically in the context of resource management and environmental change, it is suggested that social network enhances collective action and community resiliency (Adger, 2001; Pelling, Manuel-Navarrete, 2011; Jones & Clark, 2013). To summarize, social aspects will be identified and recognized as influential in establishing individuals’ reactions towards public policy, through analyzing the level of trust towards institutions, other individuals, and density of social networks.

Social capital has however received some criticism, the writings on social capital often have problems differentiation cause and effect, especially when it comes to examining economic performance, educational achievements, or regional economic growth (Petzold & Ratter, 2015. 38). Social capital has for instance been able to predict economic success, but research has proven the relationship goes both ways where economic success enhances social trust, institutional trust, and social networks (Hanka et al., 2017). Concerning climate change, the study will be careful with concluding casual relationships between social capital and perceptions on climate change mitigation. Not only could social capital be able to predict attitudes towards mitigation policies, but the relationship could also be the other way around. If the authorities were able to implement successful mitigation policies, people could develop more positive attitudes towards mitigation policies which eventually could improve trust toward authorities and people around them. These issues need to be considered and discussed theoretically in the final sections of the paper, to be able to make any suggestion about the causal mechanism.

As mentioned previously, social capital has been defined differently by different scholars. Bourdieu (1983) explains social capital as all the potential resources available from membership in social networks which are used to sustain one’s status within a society or advance to a higher status. Social capital is understood as something complementary and transformable to other types of capital, such as economic and cultural capital. Coleman (2000)

argues that the concept is a combination of the individualistic and collectivist approaches to society. Social capital is a resource that can be used for achieving peoples' own interests. These conceptualizations even if they are important to understand within different fields and contexts, will not be able to fulfill the purpose of this paper. The structural perspective of social capital provided previously advocated by Putnam (2000) will allow for testing the hypothesis of the study quantitatively. This perspective will allow analysis on both horizontal and vertical axes, both the publics' relationship to each other and the authorities within their context. Both Bourdieu (1983) and Coleman (2000) emphasize the individual characteristics of social capital rather than the collective perspective. As the purpose of the study is to understand individual's ability to act collectively towards climate change mitigation, the structural framework would be a better fit. Allowing for an understanding of the collective action within a society to enhance public policy.

Social capital will be defined as the trustworthiness and networks that connect individuals (Adger, 2010. 389). This would allow an understanding of how the social processes and climate adaptation policies become legitimized by the public. It is also widely accepted that strengthening public engagement with climate change adaption is one important factor in environmental policymaking. Examining community characteristics is therefore crucial where citizens must become involved in the decision-making process (Lorenzoni et al., 2007). Policymakers are encountered difficulties when promoting reforms to the public, even if it benefits the public with a safer society. It is, therefore, necessary to understand the public doubts over policy implementations (Pelling & High, 2005. 308-309). An essential step is to find new perspectives and approaches to understand and predict the response of different mitigation measures.

Putnam's definition of social capital mentioned earlier is often categorized in social trust, institutional trust, and social networks (Putnam, 2000). Social trust is the level of trust between the members of a community (Clark & Jones, 2013. 14). Communities with higher social trust tend to easier manage collective problems (Bouma et al., 2008). Institutional trust refers to the level of trust in the community's institutions such as the national legal system, government, and local authorities (Adger, 2010. 392). Trust is the anticipation that individuals and institutions will be reliable, which allows for cooperation and actions. It is especially important when the risk is unknown, like climate change since there is no certain solution to the problem. It has been identified as the most important mechanism of social capital. The definition of the social network differentiates depending on the types of network studied but,

in this case, it will be examined as public engagement in the political and private context (Moore & Kawachi, 2016).

Social capital explains how individuals use relationships with other actors for their own and collective good. Social capital will therefore be an important aspect to examine mitigation policy management in the context of climate change to understand the risks of climate change as both an individual and a collective problem. It is argued further that perceived social costs and benefits of climate change policies among individuals in communities will mostly be decided by the social capital where the legitimacy of the policy strategy has a major influence (Jones & Clark, 2013. 15). Higher stocks of social capital are predicted to lead to higher levels of public policy acceptability (ibid, 16). Social capital is constructed by norms and networks which make people act collectively. If the government's actions are able to provide regulatory infrastructure to mitigate different risks, the infrastructure will still be insufficient if it does not resonate with social norms (Adger, 2017. 377). Social capital could provide insight and provide explanatory power in understanding the development of collective management of environmental issues and mitigative management in the context of environmental risks. However, negative consequences have also been detected, which has illustrated how social capital could potentially harm climate change perceptions (Wolf et al., 2010). Social networks and relations could potentially provide an information flow that is not desired, for example, negative views on climate change perception. The framework of social capital will allow for an understanding of the social processes that exist within climate change implementation on different levels.

Adger (2010) discusses the synergies between state and networks when it comes to policy implementation. Both aspects need to function for the policy implementation to be effective. The structural perspective of social capital suggests that the capacity of the social groups depends on the quality of the formal institutions under which they are (ibid, 390). It is often therefore not enough with having positive attitudes towards mitigation measures, there need to be institutions that could implement these measures effectively. This will also lead to the effective promotion of the legitimacy of mitigation strategies. Mitigation processes are also built from the bottom, and dependent on social capital to form the perspective on climate change on both a local and global level (Pelling & High, 2005). When actors perceive the risk and believe that they can change policies it will enhance their mitigative capacity (Adger, 2010. 391). The relationship between community networks and the role of the state is important in understanding the development of social capital. The scenario to strive for is a

synergy between the state and civil society which promotes social and policy learning. This is part of the construction of a policy with mitigation developing through collective activities (Adger, 2001). A more undesirable situation is when social capital is not allowed to function. When there is no effective state, family relations and friendships need to substitute the roles provided by the government, which is often related to corruption and ineffective systems (Adger, 2010. 392).

Based on the theoretical framework provided, shows that social capital is an important factor for policy implementation. This study argues that to develop successful mitigation policies high levels of social acceptability and high public engagement are necessary. Using social capital can therefore improve the understanding of how societies adapt and mitigate the projected climate change impacts. Individuals are more likely to comply with mitigation measures for climate change if social capital is higher within a society. If social costs occur with implemented policy, it will be perceived as less costly compared to societies with lower levels of social capital. The theoretical ambition of this study is to test the theoretical framework provided, to examine the concepts of certain aspects of social capital and its potential effects on climate change mitigation. This could help to understand the social processes within the society and the construction of different attitudes towards climate change mitigation perceptions. The next part will explain the three common sub-categories social capital is often divided into and the relationship these factors have with climate change policy measures.

3.3.1 Social trust

Higher levels of social trust tend to lead to a more positive perception of other citizens' environmental behavior (Gachter et al., 2004). Social trust is often defined as trust within a society, which links with others that are different from themselves (Clark & Jones, 2013. 5). Wagner and Fernandez-Gimenez (2008) illustrate in their research about community-based collaboration that social capital may improve a group's ability to collaborate, manage risk, innovate, and adapt to change. Individuals' attitudes and behaviors are affected by this perception, which develops a 'virtuous circle' of local environmental responsibility. Lorenzoni (2007) similarly argues that an individual's level of engagement in climate change issues is influenced by other people within the local community. Higher social trust also affects their perceptions of the community towards environmental engagement and the willingness to resolve collective problems. This will lead to the increased perceived effectiveness of public policy and therefore acceptability as well.

It is also predicted to lead to fewer control mechanisms and regulations and increased community voluntary cooperation (Grafton, 2005). The individuals are influenced by the attitudes of the community which affects their perceptions towards environmental activism (Adger, 2010). Groups with high levels of social trust are also more likely to believe in that other members within the society will comply with certain policy requirements. This will increase the perceived level of public policy effectiveness and accessibility (Harring, 2016, 576). The communities with higher social trust will not perceive the potential costs as high as communities with lower social trust. Individuals with lower social trust have shown a positive relationship with increased perceptions of higher social and economic costs on policy implementation (Jones & Clark, 2013). Meaning that people will not only be contributing monetary to what they would believe as not worth investing but also too much change in one's personal life that is not worth the sacrifice (ibid).

3.3.2 Institutional trust

The level of trust in institutions has shown a significant effect on both climate change perceptions and policy implementation. Research has proven a strong connection between institutional trust and the level of community engagement, levels of local adaptation, and individual perceptions of environmental challenges (Gong et al., 2010; Adger, 2010). It is suggested that levels of engagement and more responsible environmental behavior are highly influenced by people's trust in the validity of the information provided by their public institutions and the efficiency of those institutions if a policy were to be implemented (Tompkins & Adger, 2004). People who tend to trust institutions have more positive perceptions of restrictions and regulations set by the institutions. Less support for policy implementation is often related to a lack of belief in the effectiveness of different governmental institutions (Aldrich, 2016). Higher levels of institutional trust have often led to individuals becoming more accepting of their monetary contribution to support climate change policies (DeBono et al., 2010).

The public environmental actions and proposed environmental policies may be influenced by the trust towards individuals with certain responsibilities for the environmental projects. If an institution is perceived to be untrustworthy, the public will not be willing to cooperate with the new suggestions or regulations because they will be perceived as illegitimate or ineffective, and potentially wasteful (Aldrich, 2010; Lorenzoni, 2007). Higher levels of institutional trust in organizations' ability to manage projects and perceived competence to manage, strengthen individual's willingness to support and accept policies from the

authorities (Adger, 2001. 6). People need to trust that institutions will be able to manage financial transactions and not waste the revenues through inefficiency or corruption. There needs to trust that others will pay their taxes and those who are entitled to subsidies will receive them (Harring, 2016. 588). It also necessary to remember the synergy between the state and the public, trust for institutions is something that has to develop, requires time, and will not change directly. If institutions are not trustworthy in reality, an improvement of institutional trust will be unlikely. Governments need to demonstrate their legitimacy rather than just being perceived as legitimate (Adger, 2010. 396). Only then will the public not only trust the implementation process but also the information they provide.

3.3.3 Social networks

Social networks have illustrated that the presence of strong social networks offers the public to take part in the policy-making processes which is crucial for environmental policy implementation (Tompkins & Adger, 2004). The number of people that are willing to implement more resilient climate change policies is influenced by information provided to the public. An information flow, of firstly, the risks of climate change need to be circulated. If the information is provided, the concern of the community with climate change and willingness to act will increase (Pelling & High, 2005. 5-6). This is predicted to be the case with social networks because more types of social networks in communities can facilitate greater information flow on environmental issues. This could lead to increased climate change awareness and changed environmental behaviors (ibid). When awareness is lower because of insufficient information circulation, risk perceptions are more likely to decrease. Within these information flows, climate policies need to encourage to enhance support for mitigation (Tompkins & Adger, 2004. 7). This will not necessarily always be the case, because it will depend on the type of social network and context. Some networks could affect engagement and climate change perceptions negatively (Wolf et al., 2010). This could create an undesired information circulation that might make climate policy implementation more difficult. The negative perception toward climate policies will eventually discourage governments from implementing climate policies (Tompkins & Adger, 2004. 7).

The factor of the social network will be divided into two categories, formal social trust, and informal social trust. Formal social networks are political engagement associated with the political institutions (political activity) and informal social networks are private social engagement with other individuals within one's environment (Pelling & High, 2005). This will allow for testing both the political and private sphere rather than combining that to

provide more specific results. Formal social networks are predicted to be crucial (Wolf et al., 2010). If a person is politically active, the person is more likely to trust the implementation process and that they will be effective. This will develop trust toward the political institutions, however, these institutions need to be legitimate and transparent to gain the trust of the public (Tompkins & Adger, 2004. 7). Informal social networks examine the private social relation, which will provide an understanding of how these social networks in the context of the study will influence support for mitigation policies. This could provide an understanding of the information circulation in the private sphere and understand the perception of the general public in their private social context within the sample of this study.

3.4 Climate change risk perception

Environmental risk perceptions are predicted to encourage public response to climate change (Smith & Leiserowitz, 2014). The perceptions of risk are socially constructed in a specific social context. Societies do not take action at every risk, it is a combination of cultural factors, media framing, and political activism that develop these perceptions (Van der Linden, 2017. 26). Research has illustrated that risk perception has a positive relationship with policy support for willingness to take actions against climate change (Brody et al., 2012). Societies with higher risk perceptions are more likely to be willing to deal with emergent risks, such as climate change (Spence et al., 2011). Individuals are more likely to act if there is an incentive to become involved and support policies that will deal with the issue if it poses a risk directly or could benefit them. The risk needs to be acknowledged by the public for these incentives to grow (Van der Linden, 2017. 26). Lacroix and Gifford (2017) have also demonstrated that climate change risk perception can predict collective action and energy conservation behaviors. Spence et al. (2011) also suggest that public concern for climate change will affect the desire to reduce energy use.

However, there is no agreement among scholars when it comes to the relationship between willingness to mitigate and risk perception showing a clear inconsistent link between these two factors (Van der Linder, 2017. 26). Scholars suggest that the relationship is an extremely weak relationship with most studies finding no effect (Bubeck et al., 2012). Some argue that other variables are moderating factors for risk perception, e.g., financial and social costs (Jones & Clark, 2013). It is argued that individuals are often aware of risks, but other hindrances limit support for the implementation of climate policies (ibid, 27). Social capital is

suggested to be one of the factors which could potentially have a moderating influence and will be elaborated on in the next section.

3.4 Social capital and risk perception

As illustrated in previous sections, research shows that both social capital and risk perceptions are necessary aspects to consider when examining the support for climate change mitigation policies. However, research combining these two factors has been scarce. Features of social capital have indicated that it is an important factor to consider concerning risk perception because it illustrates the public's confidence in institutions' ability to manage risk and that enhances collective action (Rothstein, 2005; Fairbrother, 2016). Research has found that risk perception does not necessarily lead to mitigation behaviors and requires a belief that the system can respond efficiently (Fairbrother, 2016). Fairbrother (2016) argues that risk perception is not enough to cause mitigation actions to climate change risks where the institutional trust is low. Institutional trust is therefore a crucial factor in risk perception since it reflects the confidence of the public that institutions can manage and mitigate risks (Fairbrother, 2017).

In relation to social trust, Rothstein's (2005) conceptualization of a social trap could be used to understand the interrelation between social trust and risk perception by examining problems of collective actions. A social trap is when a situation stalls and no action is taken to a complex collective problem (Rothstein, 2014). Rothstein's (2005) conceptualization of social trap focuses on the interrelated problems of social trust, risk, and collective actions. Firstly, collective action problems exist where "everyone" wins if almost "everyone" cooperates. This means that managing collective action problems need the actions of all members of society. Secondly, individuals cannot trust that everyone else will cooperate because the desired outcome requires that almost everyone else in the society is in cooperation. Thirdly, to cooperate would therefore not be rational for people that do not trust that others will cooperate, no matter their risk perceptions on climate change. If people lack trust in that others will cooperate, a social trap will be created. This will demonstrate the necessity of social trust to understand collective problems. Rothstein (2005) continues by explaining the differences between individual and collective rationality, the choice of strategy of an individual might not agree with the ideal group outcome. These decisions are constructed by societal contexts which are embedded in the collective memory of the specific society. It will therefore be difficult to change and break the social trap.

In addition to previous studies, the interrelation between social networks and risk perception will also be examined. As mentioned in the previous section, certain types of social networks, both formal and informal social networks, could increase support for mitigation policies with an information circulation that enhances these perspectives (Wolf et al., 2010; High & Pelling 2005). Formal social networks could also create transparency and perception of legitimacy which is suggested to strengthen support for the implementation process. Social networks will therefore also be hypothesized to be a moderating factor between risk perception and support for mitigation policies. With larger social networks interacting with climate risk perception, support for mitigation policies will be higher than people with small social networks interacting with risk perception.

To summarize, if an individual does not trust that others will take action, it is rational for them to not take part in collective action, regardless of their perception of risk, developing a social trap. This trap will continue to be closed if the social trust does not improve, where lack of trust creates a hinder from engaging in collective actions. One major reason could be cost-benefit reasons, if people perceive the adaption measure to be too costly or have a significant negative effect on their lives, they are less likely to agree with the policy measure (Tompkins et al., 2005). The institutions need to be perceived as effective and legitimate with the ability to implement policies properly. Social networks will also provide information circulation and could enhance the legitimacy of the institutions. This study will therefore examine the relationship between climate change risk perception and climate change mitigation with social capital as a moderating factor. Climate risk perception will not be argued to be completely dependent on social capital as previous studies have been able to prove the independent influence of risk perception on climate policies. It rather suggested that the categories of social capital will influence the relationship. Meaning that higher social capital will make the relationship between risk perception of climate change and support for mitigation policies stronger.

4 Methodology

4.1 The study

To empirically evaluate whether the level of social capital and climate change risk perception can predict perceptions on climate mitigation policies, multiple regression will be used to support the understanding of the hypothesized relationships. This will fit with the inductive nature of the study, where the study will be theory-testing. The study will test the generalizability of the theoretical framework and the mechanisms provided. Hierarchical multiple regression will be used, which allows for a more sophisticated exploration of the relationships between a set of variables based on theoretical assumptions. It is necessary for examining complex patterns and will be able to tell how well a set of variables can predict a certain outcome (Pallant, 2016. 183). A hierarchical multiple regression analysis will provide information about the models as a whole and the relative contribution of every variable that is included in the model and test the predictive ability of the constructed model. It will also be used to statistically control for additional variables when testing for the predictive ability (ibid, 184). This will allow for testing how social capital and climate change risk perceptions while controlling for other variables hypothesized to predict perception on climate change mitigation. Different blocks will be created where variables will be included step by step based on theoretical assumptions. Firstly, the subcategories of social capital will be entered into one block and thereafter climate change risk perception. Then the control variables followed by the country fixed effects (discussed later) and lastly the interaction effects between social capital and climate change risk perception. The variables will be entered in blocks, where every independent variable is examined in terms of its added value in explaining the dependent variable after the previous variables have been controlled for. When all variables have been entered, an overall model is assessed in terms of the ability to predict the dependent variable.

Interaction terms are variables that combine one of the sub-categories of social capital with risk perception to be able to interpret their predictive ability (Field, 2018. 636). This will allow for examining the moderation effect of social capital on the relationship between risk perception and climate mitigation policies. These are multiplicative interaction models that are often used in political science studies (ibid, 637). However, one needs to be careful when discussing casual assumptions, the interaction effect only shows that the variables combined

effect can predict the dependent variable (ibid). To analyze the moderation of social capital further, slope models will be constructed to be able to assess the interaction (see result chapter). Before including each interaction variable in the regression, they were centered by subtracting the sample mean from the value to avoid multicollinearity with the independent variables, meaning that this will reduce the correlation between the independent variables and the interaction effects (ibid, 638). This study will assume that the moderator variable (social capital) is affecting the relationship between risk perceptions and climate mitigation policies. If the interaction term is statistically significant, it needs to be interpreted, because then there might be a potential moderation effect (ibid). To interpret the interaction terms slopes will be compared. This is done because the coefficient terms are famously difficult to interpret directly and will therefore be using plots of predicted values (Brambor et al., 2006). This will analyze whether the relationship between risk perception and mitigation differs at different levels of social capital.

The study will be a cross-sectional study, data collected at one point at a time. A longitudinal study would have interesting but not necessary for analyzing the focal relationship. The purpose is to understand more current relationship between social capital and willingness to adapt, and not compare periods. The study is also limited by the dataset provided by ESS (2016) where this is the first time, they have included environmental survey questions. However, with the large sample provided, the study will be able to provide strong support for the relationships between the variables.

4.2 Sample

The population that will be examined is Europe, the methodological advantage of studying Europe as a unit is that it will provide a large sample with more accurate estimations and a smaller margin of error (Pallant, 2016. 65-66). Larger samples also provide less influence by outliers, therefore more likely to present results that are not skewed and closer to the population (ibid, 62). With the large sample provided by ESS (2016), more accurate inferences could be made with increased generalizability. To deal with the problem of heterogeneity between European countries, the study will include country fixed-effect model. This means that the regression model will include dummy variables for each country. This will control for different variations within countries (Wooldridge, 2013. 488). However, R square (will be used to examine the predictive ability of the model) will from the dummy

variables become significantly higher because of this and should be taken into consideration (ibid, 489).

The study will be based on the dataset from the European social survey (ESS) round 8 conducted in 2016 and released in 2018 constructed by different institutions around Europe. The survey was conducted around Europe and investigates different aspects of European citizens. Round 8 of the ESS fielded climate change perceptions for the first time and offers a comprehensive theoretically grounded dataset of public attitudes of climate change, energy security, and energy preferences. The dataset contains 44,387 respondents from 23 countries. The countries included are Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Russian Federation, Slovenia, Spain, Sweden, Switzerland, and United Kingdom. The robust design process together with high-quality translation and strict guidelines regarding data collection increases the likelihood that reliable cross-national comparisons can be made (ESS, 2020). The dataset will provide necessary information for analyzing relationships between variables occurring in a certain real-life context. Using this survey is preferred because of its accessibility to a large dataset of information. It also provides information necessary for conducting this study that includes different environmental, social, economic, political, and demographical aspects. The dataset will also allow for increasing the reliability and test broader concepts by combining variables into one variable.

Because of how the study is constructed, with the independent variables, dependent variables, and the control variables, there have been some changes in the dataset. The final dataset will therefore include 26 752 responders, less valid responders will weaken the generalizability and might provide less accurate estimations. Nevertheless, the number of responders is still large and will provide sufficient data.

4.3 The variables

This section will discuss the different variables and their operationalization. Firstly, the dependent variables, public support for climate change mitigation policies will be operationalized. Thereafter, the independent variable will be discussed where social capital will be categorized into four different variables. Climate change risk perception will also be operationalized. Finally, different control variables will also be explained in this section. Each variable has been checked for extreme outliers and missing values.

Most of these variables will be indexes, which means that different survey questions (items) will be scaled together to make up one variable. Using indexes is necessary as they are useful if one wishes to quantify more intangible and subjective ideas (Pallant, 2016. 101). By using and bringing together multiple measures related to the phenomenon a more in-depth understanding could be provided. Indexes generally increase the external validity of the measure as it provides a broader and larger number of variables into one single variable. They better represent the real-world phenomenon than a single survey question would (ibid, 105). Testing the reliability of the constructed index will be achieved by examining Cronbach alpha or the mean inter-item correlation depending on how many items are included in the index. Cronbach alpha tests the internal consistency, how related the items are. The values of the Cronbach alpha should be between 0,65 and 0,8 (Field, 2018. 1045-1046). This will assure that the items are not entirely independent from each other or not measuring the same underlying concepts. If the index includes less than 10 items the mean inter-item correlation will be used, and if it is more than 10 items the Cronbach alpha will be used (ibid, 1049-1050). The reason is that Cronbach's alpha is sensitive to the number of items in the index. With an index that has a lower number of items the Cronbach alpha values tend to be low (Pallant, 2016. 116). Therefore, the mean inter-item correlation for the items would be more appropriate. It assesses how the scores of one of the items are related to scores on all other items in an index and if they are measuring the same content. The mean inter-item correlation for a set of items should be between 0,2 and 0,7, which means that the items are relatively homogenous, but not still independent of each other. They will have unique variance but still representative of the same content domain (ibid).

4.4 The dependent variable

Climate policy support

The dependent variable is perceptions on climate change energy mitigation policies. The ESS has asked respondents what they think about different potential energy policies for climate change. Three items will be used to composite an index. The responders are asked if to what extent they are in favor of or against the following policies in their country to reduce climate change? - *Increasing taxes on fossil fuels, such as oil, gas, and coal.* - *Using public money to subsidize renewable energy such as wind and solar power.* - *A law banning the sale of the least energy efficient household appliances.* These survey questions take attitudes on mitigation policies into consideration but also the monetary willingness to contribute to

mitigation measures. These actions are ways to mitigate through energy policies to reduce the human influence on the environment by reducing greenhouse gas emissions. The three items provide different policy suggestions and measure individuals' willingness to implement mitigation policies differently. These will also consider the punishing and rewarding aspects as mentioned in the theoretical framework. The first and third item are punishing terms while the second is rewarding. There are some potential flaws, the question is whether these target individual consumers or industries. The first item, measures attitudes towards increasing taxes on fossil fuels and targets individual households. The other two question includes both support for taxes or subsidies targeting industries and not only individual consumers. Tax and subsidies for the first and second items are measures in a general way when the banned item is more specific. This could be a problem as it is different ways of understanding the policy and its practical implications. It also needs to be acknowledged that these survey questions only asked if the responders for their opinion, and that this will not lead to compliance in practice. It is also important to consider that these items imply an intention to support rather than an active real-world behavior. As discussed in the theoretical framework, these variables will be combined because of their similarities and are often implemented as policy packages where it is difficult to distinguish between them (See p. 10).

The items are originally scaled 1-5 with the values strongly in favor to strongly against. The values of the items were reversed to create a composed index that will have a scale of 1-5 with higher values being in favor of climate change adaptation and lower values being against it. This will make it easier to interpret the values with a more sensible understanding. The mean inter-item correlation is 0,25 which illustrates an internally reliable index.

4.5 Independent variables

Social trust

The first sub-category of social capital is social trust, an index will be constructed of three different items. The items are - *Would you say that most people can be trusted, or that you cannot be too careful in dealing with people?* - *Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?* - *Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?* All these values are measured on a scale from 0-10, with lower values indicating lower social trust and higher values indicating higher social trust. These questions cover different aspects of social trust and take both the individual and, collective factors into

account. This will consider the collective action dilemma, if individuals believe that people only try to take advantage of other people, there would be less incentive to act and follow the regulation implemented by the authorities. If other people are viewed as being more helpful or trustful, an individual is more likely to believe that others will act for the collective good, which will enhance collective action. The index will be scaled 0-10 (low trust – high trust). The internal reliability of the composing variables with a mean inter-item correlation of 0,51.

Institutional trust

The institutional trust will include different forms of trust towards various institutions, the responders where asked if they trust institutions such as the *government, parliament, EU, legal system, politicians, and political parties*. These are all institutions which is predicted to influence the policy process and institutions that forms the implementation procedures. (Poortinga et al., 2018). This index will include 6 items. All of them are measured 0-10 with no trust at all to complete trust. The index will also be scaled from 0-10 with no trust at all to complete trust toward institutions. The mean inter-item correlation is 0,64 which illustrates a good internal reliability.

Social networks

The last independent variable of social capital is social networks and will be categorized into two variables, formal and informal social network. Formal social networks are political engagements associated with the authorities and informal social networks are private social engagements with other individuals within one's environment. Rather than combining them, a more specific conclusion could be drawn if they are separated as previous research has illustrated that both are predicted to have a significant influence on mitigation policies (Jones & Clark, 2013).

The formal social index will include eight items and will measure if a person has been politically active and engaged within 12 months in different ways. These are: *-If the responder has contacted a politician or government official, -Worked in a political party or action group, -Worked in another organization or association, -Worn or displayed campaign badge/sticker, -Signed a petition, -Taken part in a lawful public demonstration, -Boycotted certain products and -Posted or shared anything about politics online*. This way of measuring social capital is often used, which analyzes membership in different types of associations, participation in policy processes, and civil society organizations (van der Gaag & Snijders,

2005). These are answered no/yes (no=2, yes=1). The variables have been rescaled and reversed to make more it interpretable. The values of the index will be 0-1 with lower values indicating low formal social network and higher values of a high formal social network. The internal reliability is good with a mean inter-item correlation value of 0,23.

Informal social network will include three items, the respondents are asked *-How often they meet socially with friends, relatives, or work colleagues, -How many people, if any, are there with whom you can discuss intimate and personal matters and -Compared to other people of your age, how often would you say you take part in social activities?* These items consider how an individual is socially engaged privately and how large the social private network is. These items are in different scales and have therefore been normalized which means that the items have been rescaled to be on the same scale from 0 to 1. Lower values mean lower informal social networks and higher values indicate higher informal social networks. The index is internally reliable with a mean inter-item correlation value of 0,3.

Climate change risk perception

As mentioned in the theoretical framework, recognition of climate change risks is a necessary factor to consider as it is predicted to be the first step towards climate change adaption and contributes to an analysis by comparing the effects of social capital with a willingness to mitigate as explained earlier in the theoretical framework. The item that will be used to examine climate change risk perception is, *how good or bad do you think the impact of climate change will be on people across the world?* The scale is 0-10 from extremely good to extremely bad. The addition of this item will provide data on individuals' perceptions of the potential effect of climate change. This measurement assesses if the risks of climate change are acknowledged, to what extent it is acknowledged, and what the citizens perceive the potential impact to be. This question is limited as it assumes that a person agrees with the premise that climate change occurs and will rather demonstrate what the respondent believe the potential effect of climate change will be. It does not consider if one denies climate change, however, although it is a limitation of the study not, many individuals have shown to not be in complete denial of climate change, and rather uncertainty of how much the impact will be (Poortinga et al, 2011).

4.6 Control variables

Based on previous literature control variables will be added, the regression model will be controlling for socioeconomic factors, political factors, demographical factors, cause of climate change. These will enhance the internal validity by limiting the influence of confounding variables. The independent variables will not only control for each other but also other factors that could potentially affect support for mitigation policies. These control variables are important to consider as they will be held constant to the independent variables. This will eventually support the analysis of the relationship between the variables. These variables will not be expanded upon, for further extensive analysis on these factors see previous literature.

Socioeconomic factors

Socioeconomic factors have demonstrated a significant relationship with perceptions on environmental policies. Firstly, income is predicted to influence perception towards climate policy attitudes (Ballew et al., 2020). People with higher income tend to be more willing to implement climate change policies. This variable will be scaled 1-10 with 10 different deciles given, with higher decile indicating higher income.

Education is predicted to be one of the most important factors when it comes to climate change perception. Higher education tends to lead to higher climate change awareness and therefore more likely to be willing to take actions against climate change (Echavarren et al, 2017). It is often implicitly assumed that education tends to be related to knowledge and understanding scientific knowledge of climate change (Lee et al, 2015). However, this variable has shown to be a poor predictor for climate attitudes, with skeptics being as knowledgeable as non-skeptics (Poortinga et al, 2019). This variable is measured in the number of years studied.

Political factors

Political orientation is a well-studied factor that is predicted to have a major impact on climate change policy. People who are left tend to allow more government involvement where individuals on right are less incentivized to let the authorities increase their control (Poortinga et al., 2019. 27). Climate change often means change on an individual level and potentially more restriction on a person's personal life. The survey question involves a self-placement on a 10-point scale ranging from 0 (left) to 10 (right). The question is: *In politics, people*

sometimes talk of 'left' and 'right'. Where would you place yourself on this scale? This will indicate individuals' political orientation.

Human values are another political variable that is highly predicted to influence the dependent variable (McCright & Dunlap, 2011). Poortinga et al. 2019 argue that values are an important part of forming our beliefs and attitudes towards social issues, such as climate change and behavior concerning the environment. The study makes a distinction between two axes, conservation versus openness-to-change (6 items) and self-transcendence versus self-enhancement (9 items) (see appendix 1). It has been illustrated that people who have self-transcending values have higher levels of concern and are less likely to be skeptical about climate change, and the opposite for people with self-enhancement values. They are more willing of enhancing their interest rather than what is best for the community (Poortinga et al. 2019; Brown & Kasser, 2015). The conservation versus openness-to-change distinction shows that individuals with openness-to-change believe in climate change and that it is human-driven. Those who are supporting conservation values are less worried about making changes for the environment and want less change within the society (Schultz & Zelezny, 1999). Both variables are measured from 1-5 where lower values indicate increased conservation or self-enhancement and higher values indicating openness or self-transcendence. Both illustrate internally reliable predictors, conservation versus openness-to-change with a mean inter-item correlation value of 0,2 and self-transcendence versus self-enhancement with a mean inter-item correlation value of 0,21.

Demographic factors

Research has illustrated that different demographical factors could be potential predictors for climate policies. Gender is often predicted to be a mediating factor, where women tend to support climate policies more often where men are more resistant to climate change policies and less concerned (Poortinga et al. 2019). Gender is indicated as 0 (female) and 1 (male) with male as the reference category. This means the category male will be compared to the category of female. Age is also predicted to have an influence and will therefore be controlled for. Older people tend to be less likely to support climate change policies and are usually less concerned (Echavarren et al., 2017; McCright, 2010). This is suggested to be due to that older people are less likely to be willing to change their habits. The influence of age has been explained by the motivation to maintain current social structures. Older individuals are more integrated with current social orders and changes are perceived as potential loss (Cornelis et

al., 2009). Values tend also to change during the life course with individuals becoming more conservative as they grow older (Eaves et al., 1997). This variable will be measured in the number of years lived.

Cause of climate change

Previous research has been able to show that if one believes that climate change is human-driven, a person is more likely to support climate policies (Poortinga et al. 2011). If one believes that climate change is a completely natural process, the person is less likely to be willing to support and contribute to climate policies since they believe that there is no potential benefit of the policy (ibid). This kind of skepticism rejects mainstream climate science and argues whether climate change is caused by human activity. If one does believe that climate change is a completely natural process, the person will be less incentivized to act. This variable will be based on the question, *do you think that climate change is caused by natural processes, human activity, or both?* The scale is a five-point scale from entirely by natural processes to entirely by human activity.

Table 1

Descriptive Statistics of All the Variables

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Support for climate policies	41 493	4	1	5	3,42	0,82
Social trust	43 872	10	0	10	5,43	1,86
Institutional trust	40 081	10	0	10	4,32	2,09
Formal social networks	43 863	1	0	1	0,14	0,19
Informal social networks	43 026	1	0	1	0,51	0,18
Climate change risk perception	41 232	10	0	10	3,26	2,19
Left or right	38 583	10	0	10	5,16	2,24
Years of full-time education completed	43 963	54	0	54	13,04	3,85
Income	36 445	9	1	10	5,19	2,73

Self-enhancement versus Self- transcendence	42 404	5	1	6	4,14	0,69
Conservation versus Openness-to-change	42 350	5	1	6	4,08	0,70
Gender	44 378	1	0	1	0,47	0,49
Age of respondent	44 232	85	15	100	49,14	18,61
Natural process-Human activity	42 234	5	1	5	3,84	0,81

4.7 Limitations

The limitations of this study need to be discussed. Firstly, questionnaires often have difficulties with providing a deeper understanding of the process and the contextual differences because they are limited in length and depth of responses. Answers are also interpreted differently by individuals and should be taken into consideration. When making assumptions about relationships about different variables one needs to be careful about discussing casual relationships. The statistical analysis provides an understanding of the correlations between variables, but the casual relationships need to be complemented theoretically where the relationships can work in different directions. The generalizability of the study has its limitation, as the sample is within several European countries and can therefore not be applicable to other continents or regions. The purpose of the study is to support the hypothesized assumptions presented and test if these mechanisms functions within the European context. Future studies need to analyze other regions to support the theoretical framework. The theoretical assumptions can therefore not be rejected but only supported.

This study has decided to examine mitigation through energy policies. This can be expanded since there are different ways to mitigate the risks of climate change. Energy mitigation measures have been chosen since it is one of the most important ways to mitigate. Since the quantitative nature of the study, there is an absence of the individual experience and a more contextualized understanding of for instance a community-based understanding. The study will control for the variation within every country, but no conclusion about the relationship between the dependent and independent variables in every country could be demonstrated. This is however not the purpose, the large sample size provided by ESS (2016) includes

samples of the European countries and will provide more accurate results. This will allow for a larger generalization by examining different European countries rather than one country.

5 Results

Hierarchical multiple regression was used to analyze perceptions on climate change policies by including the independent variables of social capital and climate change risk perception while controlling for other variables. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, independence, and homoscedasticity. The linearity assumption was first checked because a multiple linear regression imposes a linear relationship on the data points that presents the relationship between the dependent and independent variables. If the relationship is not linear, the model will not have a proper fit (Muji, 2004. 177). Multicollinearity is that the independent variables are not too strongly correlated with each other. This could make it difficult to estimate the relationship between the dependent and independent variable because it will be hard to calculate the individual contribution of each variable (ibid, 181). Check of normality means that the data is normally distributed, this is needed to make valid inferences from the regression. With a large sample, this tends to the case and less likely to provide skewed results. Meaning that most responders will be closer to the mean values and decrease the further it gets from the mean which will be closer to the real values of the population (Field, 2018. 329). Homoscedasticity is whether these residuals are equally distributed, or if they are bunched up together at certain values or spread far apart. This is important because the regression will assume that all residuals are drawn from a population that has constant variance. These values need therefore to be spread apart to make the coefficient estimates more precise and closer to the real population value (ibid, 333). The assumption of independence means that the errors in the model are not related to each other, which means that the observations are independent of each other (ibid, 335).

At the first stage, only the factors of social capital were entered, explaining 5,6% of the variance in perceptions on climate change mitigation by examining R square. In step two, climate change risk perception was included, which added 2,8% to the total variance and a total of 8,4% of the variation. This illustrates that climate change risk perception has added value and can explain some variation of attitudes towards climate change mitigation policies.

Step three included all the control variables which explained an additional 4,5% with a total variance explained of 12,9%. The fourth model included the country-fixed effects to control for variation between countries. This will in most cases increase explained variation because of the added number of variables (country dummy variable for each country). In this case, the country-fixed effects have added an additional 2% with a total of 14,9% of the variation. In the last model, which includes the interaction terms, the R square is 15% with only a slight increase in variation. The R square measurement is used because it measures how well the variables together can predict the dependent variable by calculating the amount of variance in the dependent variable explained by the independent variables together. Because of the modest R square, this shows that there might also be other variables that have an influence on the support for climate change mitigation policies (Muji, 2014. 167).

Table 2

Model Summary Demonstrating the Contribution of Every Model Included

Model	R Square	Std. Error of the Estimate	Change Statistics			
			R Square Change	F Change	Sig. F Change	F
1	0,056	0,77	0,056	396,266	,000	397,44***
2	0,084	0,76	0,028	391,74	,000	487,74***
3	0,129	0,74	0,045	190,015	,000	304,14***
4	0,149	0,73	0,020	28,213	,000	133,51***
5	0,152	0,73	0,002	16,528	,000	121,96***

p < .05. *p < .01.

Every model provides statistically significant contributions shown by the Sig. F change value ($p < .001$). The null hypothesis, that the model is able to explain zero variance in the dependent variable ($R \text{ square}=0$) (Field, 2018. 506), could therefore be rejected. This means that every block added can contribute to the model and is able to explain an amount of the variation in the dependent variable. The inclusion of the interaction variables in the fifth model also demonstrates a statistically significant increase in the amount of variance in climate change mitigation perceptions. This provides support for the hypothesized mechanisms that an interaction effect exists between social capital and climate change risk perceptions (Field, 2018. 546). The model as a whole, which includes all blocks is also significant ($F(39,2660) = 121,96, p < .001$).

To evaluate each of the independent variables, the coefficients need to be analyzed along with their potential influence on the dependent variable. Here, the study will look at the standardized coefficients and not the unstandardized coefficients. The standardized values have all been converted to the same scale to make a comparison possible. Unstandardized values are measured in their own original scale, and a comparison would therefore be difficult to achieve with these values (Field, 2018. 551).

Table 3

Hierarchical Multiple Linear Regression Analysis for Variables Predicting Support for Climate Change Mitigation Policies

Model		Standardized		
		Coefficients	Unstandardized	Coefficients
		Beta	B	Std. Error
1	(Constant)		3,004	,020
	Institutional trust	,149***	,059	,003
	Formal social networks	,145***	,566	,024
	Informal social networks	,037***	,173	,029
	Social trust	,013***	,006	,003
2	(Constant)		2,562	,025
	Institutional trust	,159***	,063	,003
	Formal social networks	,117***	,459	,024
	Informal social networks	,033***	,152	,029
	Social trust	,026***	,012	,003
	Climate change risk perception	,169***	,062	,002
3	(Constant)		1,793	,051
	Institutional trust	,150***	,059	,003
	Formal social networks	,089***	,348	,024
	Informal social networks	,019**	,086	,029

	Social trust	,026***	,012	,003
	Climate change risk perception	,109***	,040	,002
	Placement on left right scale	-,080***	-,029	,002
	Age	,026***	,001	,000
	Education	,042***	,009	,001
	Income	,044***	,013	,002
	Self-enhancement versus Self-transcendence	,074***	,088	,009
	Conservation versus Openness-to-change	-,002	-,002	,009
	Gender (Male)	-,047***	-,075	,009
	Natural process-Human driven	,164***	,169	,006
4	(Constant)		2,032	,057
	Institutional trust	,143***	,056	,003
	Formal social networks	,083***	,326	,025
	Informal social networks	,002	,009	,030
	Social trust	,027***	,012	,003
	Climate change risk perception	,107***	,039	,002
	Placement on left right scale	-,077***	-,028	,002
	Age	,020	,001	,000
	Education	,060***	,012	,001
	Income	,038***	,011	,002
	Self-enhancement versus Self-transcendence	,060***	,071	,009

	Conservation versus Openness-to-change	-,005	-,005	,009
	Gender (Male)	-,049***	-,078	,009
	Natural process-Human driven	,156***	,160	,006
5	(Constant)		2,049	,057
	Institutional trust	,142***	,056	,003
	Formal social networks	,076***	,297	,025
	Informal social networks	,002	,009	,030
	Social trust	,023***	,010	,003
	Climate change risk perception	,102***	,037	,002
	Placement on left right scale	-,073***	-,027	,002
	Age	,022	,001	,000
	Education	,058***	,012	,001
	Income	,039***	,011	,002
	Self-enhancement versus Self- transcendence	,060***	,071	,009
	Conservation versus Openness-to-change	-,003	-,003	,009
	Gender (Male)	-,049***	-,078	,009
	Natural process-Human driven	,155***	,159	,006
	Social trust*Climate change risk perception	,025***	,005	,001
	Institutional trust*Climate change risk perception	,001	,000	,001

Informal social network*Climate change risk perception	,009	,018	,013
Formal social network*Climate change risk perception	,035***	,063	,011

Note. *Male as reference category.

Austria as reference category for country dummy variables.

p < .05. *p < .01.

The independent variables that have statistically significant contribution (less than 0,05), in order of highest influence according to their standardized beta values are natural process-human activity (0,155***), institutional trust (0,142***), climate change risk perception (0,102***), formal social network (-0,076***), political values (left-right) (-0,073***), self-transcendence-self-enhancement (0,060***), education (0,058***), Gender (male as reference category) (-0,049***), income (0,039***), social trust (0,023***). Three variables were not able to make a unique statistically significant contribution, these were informal social network, age, and conservation-openness. What is meant by statistical significance is the probability of detecting a deviation from the null hypothesis, that a small p-value means that the data is unlikely to be under some null hypothesis (that there is no relationship). If the p-value is large, then the data and relationships are perceived as being explained by chance alone (Aldrich & Cunningham, 2016. 132).

Most of the hypotheses provided earlier could be supported. Institutional trust, social trust, formal social networks, and climate change risk perception can support the hypothesis of them having a positive effect on perceptions on climate change mitigation policy. Informal social networks could however not provide statistically significant results and therefore not able to support the hypothesis. These were statistically significant through all models with some variation in the standardized beta coefficient. The control variables did in most cases behave as expected. Both the socioeconomic factors, income, and education showed a positive relationship with support for climate mitigation policies. Two of the political factors were also statistically significant, political views and self-transcendence-self-enhancement. A person who is more politically right-leaning or self-enhancing is more likely to have negative perceptions towards support for climate change mitigation policies. The Openness-versus-conservation variable was shown to be statistically insignificant and therefore not able to

predict the dependent variable. One demographical variable that demonstrated the ability to predict climate change mitigation perception which was gender. Males are more likely to have negative perceptions toward climate change policies. Age, similarly, to previous literature (Poortinga et al., 2018) demonstrates insignificant results. The human activity-natural process variables demonstrated a strong positive relationship with support for climate change mitigation. Meaning that if an individual perceives climate change as more of a human-driven process the person is predicted to be more willing to support climate policies.

The fifth model also included the interaction terms. Here, two interaction terms were statistically significant, which was the interaction between social trust and climate change risk perception and, between formal social networks and climate change risk perception. This means that the null hypothesis of there being no interaction between the social trust or formal social networks and climate change risk perceptions can be rejected. However, the null hypothesis for the other interaction terms cannot. Next, the clearest way to interpret these results is to plot them in graphs to analyze the interaction effect between the potential moderating effects of social capital on climate change risk perception. Since the significant value only demonstrates that the variables combined can predict the dependent variable and not able to illustrate a moderating effect. Only two interaction terms will be analyzed further, social trust interacting with risk perceptions and formal social network interacting with risk perception to predict attitudes toward climate policies. The other two will not be considered since there is no statistically significant interaction effect.

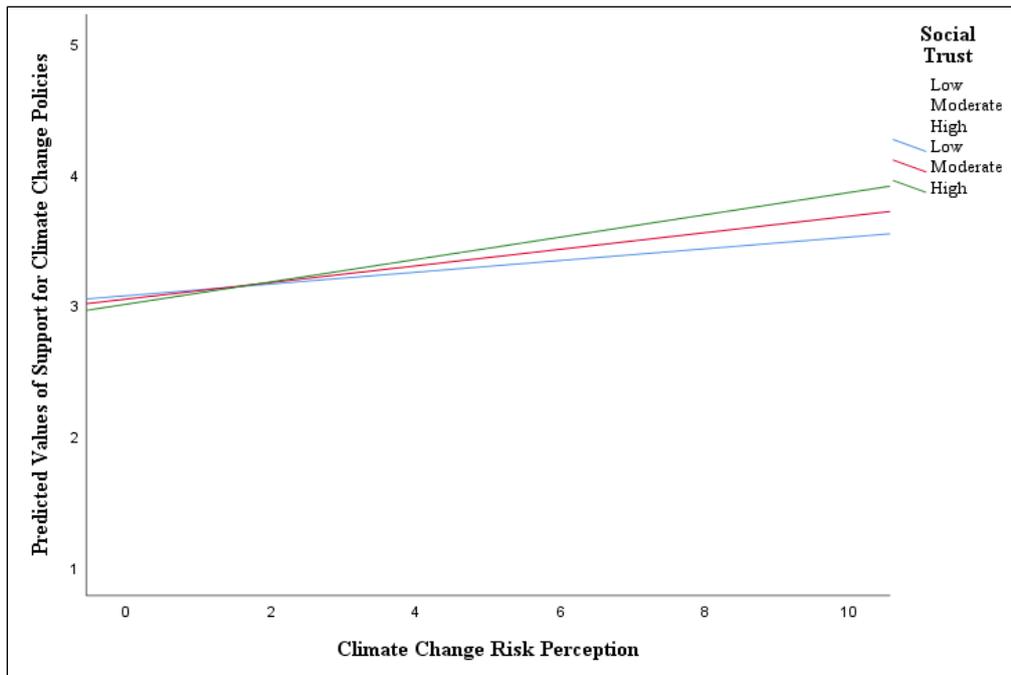


Figure 1: *Line graph of the interaction between climate change risk perception and social trust.*

The previous regression models tested that climate change risk perception and social trust are able combined as an interaction term to predict attitudes towards mitigation policies. Figure 1 demonstrates that people with higher climate change risk perception tend to support climate change mitigation policies more no matter how high the social trust is. It shows a difference in slopes for the three categorized groups of social trust (low- moderate- and high social trust) across different values of climate change risk perceptions, demonstrating a potential moderating effect. The slopes illustrate that individuals with low social trust and extremely low climate change risk perceptions have slightly higher support for mitigation policies than people with high or moderate social trust and extremely low climate change risk perception. High social trust together with low climate change risk perception tends to have the lowest support for mitigations measures with moderate social trust being in between low and high. However, as risk perception increases individuals with high social trust become more supportive of climate policies than the other two groups of social trust showing the moderating effect. The hypothesized moderating effect could be supported, individuals with extremely low risk perception and low social trust shows at the beginning of the slope that these individuals are slightly more likely to be willing to support climate measures. These tendencies change rather quickly to where people with higher social trust and climate change risk are more likely to support mitigation policies when risk awareness increases. It could be argued that when risk perception is extremely low, there is a small (almost non) influence by

social trust. Those with extremely low climate change risk perception see no reason for mitigation because they do not recognize the risk and the potential harm, no matter how high the social trust is. Collective action is perceived as not necessary and a belief that others will comply with climate regulation will not have any effect on their support for mitigation. The differences increases when risk perception increases, with social trust being more influential with increasing risk perception. When climate change risk perception increases, the risk is recognized and a belief in others' compliance will matter. Eventually, with a higher belief that others will comply for the common good, the regulation will be perceived as being more effective if implemented. The assumption of social trust as a moderator between the relationship of climate change perception and attitudes toward climate change mitigation policies has illustrated a moderating effect where higher social trust makes the relationship stronger between risk perception and support for mitigation policies. Possible influences of skewness have been checked, the categories of social trust had an almost similar number of responders within every level (value) of risk perception.

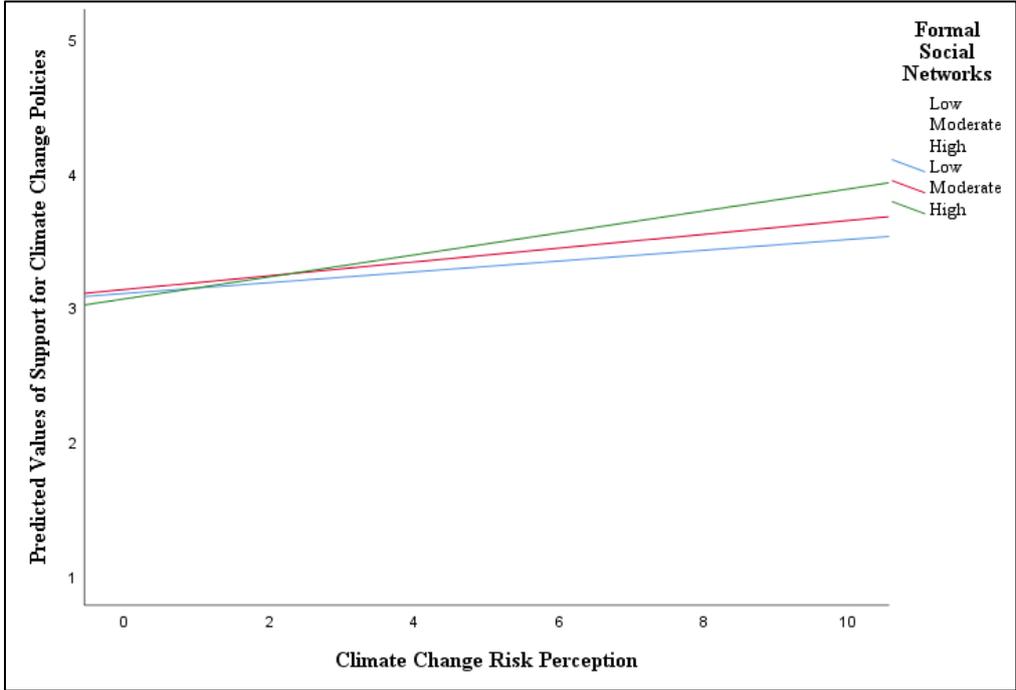


Figure 2: Line graph of the interaction between climate change risk perception and formal social networks.

The other statistically significant interaction term was between formal social networks and climate change risk perceptions. Figure 2 demonstrates an interaction effect between formal social networks and risk perception. Similarly, to figure 1, with increasing climate change risk

perception, support for mitigation policies also increases for all the different levels of formal social networks. The figure demonstrates an interaction effect and a possible moderating effect by formal social networks. People with high formal social networks and extremely low climate change risk perception have slightly lower support for climate change mitigation policies than people with low formal social networks and extremely low risk perception. Eventually, with increasing risk perception, individuals' higher formal social networks will be more likely to be willing to mitigate. It is argued once again, that when climate change risk perception is extremely low, people see no reason for mitigation and hence the small difference when risk perception is extremely low. The hypothesized moderating effect could be supported as formal social networks did seem to have a moderating influence between risk perception and support for climate policies. It demonstrates a low influence when risk perception is low and more influential when risk perceptions increase. Individuals with higher formal social networks are more likely to be willing to mitigate when risk perception increases. This demonstrates that higher formal social networks will make the relationship between climate change risk perception and climate mitigation policies stronger. Possible influences of skewness have also been checked in this case, the categories of formal social networks had an almost similar number of responders within every level of risk perception.

Overall, the hypothesis on social capital as a moderating factor for climate change risk perception on climate change mitigation could partially be supported. The results do not completely correspond with the assumptions, as not all interaction terms were statically significant. It demonstrated that people with extremely low risk perception were not influenced by social trust or formal social networks factors, but only for higher values. This shows the importance of risk perception, where extremely low risk perception is not being enhanced by either higher social trust or formal social networks.

To conclude, the hypothesis of the positive relationship between social capital and support for climate change mitigation could partly be supported. Three sub-categories of social capital could be supported with social trust, institutional trust, and formal social networks being statistically significant. Informal social networks were not able to demonstrate any significant results. Climate change risk perception is also able to predict attitudes towards climate mitigation policies, which also corresponds with the hypothesized assumptions. The moderator effect of social capital could also partly be supported, with two interaction terms showing statistically significant results. Both social trust and formal social networks have been illustrated to have a moderator effect between the relationship of risk perception and

support for climate change mitigation policies. Institutional trust and informal social networks did not demonstrate any statistically significant interaction effects and can therefore not be supported with confidence. The results of the moderation effect have shown how important it is to have higher risk perception, where the moderating variables not being able to influence willingness to mitigate when risk perception is exceptionally low. However, showed an influential positive effect on support for climate change policies with increasing climate change risk perception. Additional findings demonstrate that there are significant relationships between socio-economical factors, demographical factors, political factors and the belief of climate change cause in relation to support for climate change mitigation.

6 Discussion

For governments to establish policies to mitigate climate change there needs to be public support for these policies. This study emphasizes the importance of social trust, institutional trust, formal social networks, and climate change risk perception to understand this support. These factors all demonstrated independent influence on attitudes towards mitigation policies with moderating effects between some of the independent variables. This section will continue to discuss these relationships. Firstly, the relationship between social capital and support for climate change mitigation policies will be analyzed. Thereafter, the relationship between climate change risk perceptions and attitudes towards climate mitigation policies followed by an analysis of the moderating effects. Finally, concluding remarks will be discussed with suggestions for further research.

6.1 Social capital and support for climate change mitigation policies

The different sub-categories of social capital presented varying results. Social trust, institutional trust, and formal social networks had statistically significant results. The relationship between informal social networks and perception on climate change mitigation was not able to provide support for the hypothesized relationship where the null hypothesis could not be rejected. However, the theoretical assumption should not be discredited. Future research should explore this relationship further with different samples and populations to determine the relationship. The three significant factors demonstrated a positive effect on support for climate change mitigation policies. The results also suggest that institutional trust

is the strongest predictor followed by formal social network and thereafter social trust. These variables were consistent through every model presented.

This result implies and provides support for the hypothesis that social trust, institutional trust, and formal social networks are needed to establish support for mitigation policies. Duffy and Wong (2000) suggest that trust will affect a person's expectation and with higher trust leading to more positive perceptions, cooperation will be perceived as beneficial and not harm personal interest. Lewicki and Wiethoff (2000) support this assumption and argues that willingness to act is based on words, actions, and decisions of others. Individual trust is decided by the development of the belief in the system through life experiences, established rules or norms in the community or institutions, and experiences of relationships. For governments to succeed with their emission goals, the institutions within countries must therefore build on the current declining institutional and social trust. The public needs to become politically engaged and when they are, they will need a positive experience which only could be achieved if the formal institutions demonstrate their effectiveness. As Adger (2000) argues, the capacity of collective action depends on the formal institutions they are under. It will not be enough with the public having a positive perception toward climate change mitigation, but there is also a need for formal institutions to implement the policies effectively.

People in societies with low trust for institutions are less likely to support higher taxes because there will be perceived expectation that the tax revenues would be wasted or stolen because of corruption or that the system allows for tax evasion. That not just your taxes are dealt with effectively but also others and those who are entitled to subsidies will receive them (Harring, 2016. 575). Meaning that with high trust, the public will expect that the revenues from the climate tax will be well spent and effectively implemented. Clark and Jones (2013) suggest the belief that the formal institutions will be more effective and will have a positive influence on policy implementation. The public will be more accepting of their monetary contribution being used to support collective problems (DeBono et al., 2010).

Research has also demonstrated that societies within a low-corruption context, show that where tax revenues are being spent is important for policy support (Kallbekken & Sealén, 2011). Similarly, it could be argued for climate change subsidies, with a perceived corrupt state, there is a high risk that the public will believe that the authorities will provide subsidies to individuals who are not entitled to them, and subsidies themselves also need to be financed through tax revenues (Heres et al., 2017. 12). It is further argued that citizens with lower trust

for authorities want less state intervention where individuals with higher trust are more supportive of interventions such as taxes and subsidies if they live in societies with well-functioning, fair, and uncorrupt institutions (Aghion et al., 2010). This could be demonstrated by the results presented earlier, both lower social and institutional trust is more likely to lead to a person being less accepting of intervention through climate taxes and subsidies. When the public perceives the institutions as ineffective, the public will see the implementation processes as costly measures not worth investing in (Jones & Clark, 2013. 10). It has been demonstrated that trust in the organization handling environmental projects and the perception of organizational competence to manage natural resources will lead to increased public support and acceptability for different environmental policies from organizations. The information provided by these institutions is more likely to be trusted with higher institutional trust (Lorenzoni et al., 2007).

Higher levels of social trust within the society will increase the perception that other people within the society will comply with the introduced policy (Jones & Clark, 2013). Wagner and Fernandez-Gimenez (2008) argue that community-based collaboration will improve the ability to manage risks by adapting a ‘virtuous circle’ of local environmental responsibility. How people perceive people around them will affect how willing they are to solve collective problems. There needs to be a belief that all members of the community will act together for the common good (Pelling & High, 2005. 4). The costs that could occur with these mitigation measures are more likely to be accepted if everyone is willing to comply and contribute (Lorenzoni et al., 2007). When the public is more likely to follow, fewer control mechanisms and regulations are therefore needed (Grafton, 2005). For people to be willing to pay taxes, there must be a trust that others will also pay. To make these environmental taxes and subsidies efficient, people and companies need to pay and not claim substitutes if they are not entitled to it. People will then be more likely to prefer these policies where there is a general trust for the public (Harring, 2016. 575).

The results also illustrate that formal social networks can predict support for climate policies. With a greater information flow, the public awareness of the need for climate change mitigation will eventually lead to increased support for climate change management (Tompkins & Adger, 2004; Jones & Clark, 2013). However, this is not always necessarily the case. The variable of formal social networks in this study is measured as political activity. This means that in this sample, within the European context, political engagement is suggested to enhance support for mitigation policies. Other samples within other contexts

could provide different results. The political aspects differentiate within communities and countries where research has demonstrated negative effects on support for climate policies through existing social networks (Wolf et al., 2010). This means that for political engagement to have a positive influence on support for climate policies, there needs to be an information flow that is supportive for these policies with an understanding of the risks of climate change. Political engagement could also be a way to achieve and develop institutional trust that could increase trust toward the political process. The implementation process will be perceived as legitimate and trustworthy (Jones & Clark, 2013). For this the different political institutions need to illustrate effectiveness and legitimacy for the public (Davidovic & Herring, 2020. 2), only then could political engagement enhance trust towards institutions which will eventually lead to higher acceptance of climate taxes or subsidies.

Social trust, institutional trust, and formal social networks have shown a significant positive influence on support for the implementation of climate policies through energy consumption. People are more likely to be willing to take action if they believe that others will act in the same way to manage the community's shared interest. These will be necessary factors for policymakers to consider for successful policy implementation. However, the direction of the causal relationships needs to be considered as well, countries with higher social capital might have been influenced by successful mitigation policies, which could potentially have led to positive perceptions on mitigation policies which have thereafter influenced both social and institutional trust. To understand this relationship, further research should consider these factors and the direction of the relationship.

The framework of social capital demonstrates that a better understanding of community and individual level relationships is needed to examine how information is distributed, how networks are structured, and how community knowledge is constructed. The government's actions will be the most influential factors for achieving successful policy implementation since the public and industries are often market-driven with profit incentives (Tompkins et al 2010. 628). With a decreasing trust for governments around Europe and other countries (Algan et al., 2017), implementation of mitigations and other political policies will be even more difficult to achieve. Similarly, with the decreasing social trust, collective action will be less likely to be successful with less incentive for community cooperation. Communities need to build trust within to be able to solve the collective dilemma where the public needs to become more engaged in the processes of not just the implementation but also the political process to build trust towards the institutions (Fairbrother, 2016; Rothstein 2005). This will

eventually enhance perceived legitimacy toward institutions and become more supportive of the process of policy implementation.

As Adgers (2010) suggest, there needs to be a synergy between the authorities and the public to enhance the effectiveness of policy implementation. Both social trust and institutional trust are rather difficult to improve, it is something that is rooted culturally and requires time to develop (Kallbekken & Sealen 2011). Nevertheless, there are some possible solutions that governments can do, this can be achieved by emphasizing policy design, information, and communication strategies (Carattini et al., 2018). There are practical solutions for enhancing the trustworthiness of policymakers and their proposed policies. Information campaign needs to be carefully designed and adjusted to the groups to people with differentiating knowledge (Davidovic & Harring, 2020. 9). Social and institutional trust needs to be acknowledged before deciding which strategies should be used. These aspects are also context-dependent, implementing for instance a global carbon tax will probably not work without taking countries' contextual factors into account. An understanding of a country's development needs to be considered, in certain countries implementing environmental taxes might not be the priority before other development goals. The regulations are then less likely to be followed since the ability to enforce regulations is usually weaker with a greater risk of tax evasion. Taxes are therefore not always the best solution to solve collective action problems. Citizens need to be willing to and accept to pay the taxes for environmental policies. For long-term success, the quality of the institutions must be legitimate (Adger, 2001). If the public is more engaged within the formal social networks, people need to see that these institutions are working effectively.

To solve collective problems, social capital has illustrated a crucial factor in understanding the acceptability of policy implementation in relation to support for climate regulations. It also shows how necessary it is that policies resonate with social norms and which factors need to be enhanced to make climate mitigation policies achievable. The conceptualizations of social capital have allowed for an understanding of the social process behind mitigation, rather than only examining it as technical adjustments. The different discourses that are constructed needs to be considered to understand how the policies are politically framed.

6.2 Climate change risk perception

Climate change risk perception demonstrated a positive relationship with support for climate mitigation policies. More risk-averse people are more likely to support mitigation policies

(Lacroix & Gifford, 2017). The analysis presents that risk perception is strongly associated with climate mitigation through energy policies as one of the most influential predictors. In line with Stoutenborough et al. (2015) suggestion, that the better a person can evaluate the risk, the better a person can make informed policy decisions. Climate change risk perception was also consistent through all the models which illustrate the importance of an informed public. If governments have the ambition of implementing effective climate policies, they should aim to inform the public about the risks. The difficulty with making the public more aware of the risks is that climate change is for the most part not directly visible and usually not having a direct impact, it is rather a slow process (Pendall et al., 81). The mitigation measures are also not rewarding directly, it is a long-term process with potential benefits in the future (Coppola, 2014. 210). Nevertheless, it is still important that individuals acknowledge the risks and understand how it could potentially harm them. This will make people more likely to implement policies for protection and be able to mitigate climate change. The results did function as the hypothesized assumptions, that climate change risk perception can lead to the desire to reduce energy use. If the citizens do not believe that climate change is a serious risk that needs immediate attention, the government will also lack incentive to act (Davidovic & Herring, 2020. 9).

As climate change risk perception illustrates an independent linear effect on support for climate mitigation policies, two concepts of social capital demonstrated significant moderating effects between the relationship of risk perception and support for climate change policies, both social trust and formal social networks. The results presented that the relationship between climate change risk perceptions and support for mitigation policies is stronger for people with both higher social trust and formal social networks. These variables could be supported as moderating variables between the relationship. The result could show how climate change risk perception together with social trust or institutional networks can pattern individual perceptions in climate change mitigation cross-nationally. Institutional trust and informal social networks did not present significant interaction terms and the assumption can therefore not be supported, but further studies should use different samples and contexts to examine these moderating effects.

The results were able to show that the moderating factors did not seem to have an influence if people had extremely low-risk perception, where both social trust and formal social networks did not have a significantly major effect. Whereas with higher risk perception the differences between the different groups increased. Those with extremely low risk perception are more

likely to not be affected by either social trust or formal social networks, which demonstrates the importance of higher risk perception. People with extremely low risk perception, because do not acknowledge the risks of climate change there will be no value for mitigating no matter how high the social trust or formal social networks is. With higher risk perception, there is a belief that the risks of climate change are potential harm where the moderating variables could enhance the willingness to mitigate. With higher social trust, as mentioned earlier, an incentive for acting collectively will increase if people believe that others will also take initiative e.g., following the regulation and making the monetary contribution (Lorenzoni et al., 2007; Adger, 2001). This will support that the belief that the mitigation implementations will work and will therefore comply. The hypothesized social trap is evident here, when there is a belief that most people do not cooperate within society, the situation will stall, and collective action is less likely to occur. Formal social networks will within the right circumstances (information flow) inform people about the risks and therefore increase their support for mitigation (Pelling & High, 2005), which was the case in this sample. Another factor might be that people engaged in politics are provided the opportunity to view the process within the institutions. This could lead to their trust in these institutions and the implementation process (Tompkins & Adger, 2004). It is therefore important to emphasize how crucial it is to enhance social trust and engagement informal social networks.

This study suggests that social trust and formal social networks could potentially be moderating factors between the relationship of climate risk perception and support for mitigation policies. It illustrates that they have a combined effect, but climate change risk perception still has a strong independent influence. The moderating effects showed that they enhanced the relationship, especially for those with higher risk perception where they were more likely to support climate policies if they had higher social trust or formal social networks.

7 Conclusion

To be able to reach the emission ambitions, governments will need to implement climate policies to enforce collective action. This will only be effective with the support of the public and if the rules and regulations are followed. State interventions are more likely to succeed if it is supported by the citizens and enhanced by collective actions. The purpose of this study

was to contribute to the current literature by understanding the relationship between collective actions and support for climate mitigation policies. The contribution is not only an analysis of these variables independent influence but also their interaction effect. This study has been able to, through using a hierarchical multiple regression, demonstrate how different social dimensions can predict support for climate policies by using the theoretical framework and conceptualizations of social capital. Three out of four hypothesized relationships between the sub-categories of social capital and support for climate policies could be supported. Social trust, institutional trust, and formal social networks had all positive relationships with mitigation policies. Informal social networks did not provide any significant results, this means that social private relations in this sample were not able to predict the dependent variable.

Climate change risk perception demonstrated a strong positive relationship with willingness to implement climate change policies as one of the most influential factors. This shows the necessity of widespread public concern to be able to manage effective policy implementation. Climate change risk perception did illustrate an independent influence. However, both social trust and formal social networks demonstrated moderating effects for the relationship between climate risk perception and support for climate policies. Both moderating factors particularly when increasing enhanced the relationship between climate risk perception and support for climate policies. Individuals with lower risk perception did not seem to be influenced by the interactions. It was only when risk perception increased where the moderating variables seemed to influence the relationship.

The findings argue that it would be difficult to implement mitigation policies globally without a sufficient level of social capital. Policymakers need therefore to carefully plan how they can be perceived as more trustworthy and enhance trust toward the policy implementation process. Both the level of social and institutional trust could be deeply rooted in society but can also change. This can be achieved by focusing on policy design, information, and communication strategies. Social and institutional trust needs to be acknowledged before deciding which strategies will be used. These aspects are also context-dependent, implementing for instance a global carbon tax will probably not work without taking social relations and institutional differences within a country into consideration. The results demonstrate important policy implications, an active public is necessary for a successful climate policy. If the citizens do not believe that climate change is a serious risk in need immediate intention, the government will not take actions. Risk awareness needs therefore to

be improved first. Thereafter, to facilitate collective action and support for climate policies an understanding of social trust, institutional trust and formal social networks is necessary. These theoretical assumptions between the observed and expected data do not prove that the theory is correct or incorrect. Even if this study presents support and is consistent with the theoretical framework, another sample could provide other results. This study will rather support the theoretical assumptions of the hypothesized relationship within the European context. Further studies need analyze these hypotheses and replicate to strengthen the exploratory power of the theoretical framework.

Further research could use a qualitative approach, employing limited case studies to understand how social dimensions shape perceptions by providing an in-depth analysis with a more context-based understanding. Also, the study uses data from European countries, and to understand if these results are generalizable, research should examine other countries and continents to study the causal mechanisms of social capital and climate change risk perception act similarly in relation to climate change policies in other contexts. Longitudinal research would add value to understand the historical process if there is a relationship between the decreasing trust and support for climate policies for instance. Further research could also examine other potential moderating or mediating factors. Other control variables could also be added that account for some variation in the dependent variable. The content validity could be improved, meaning that the way the variables are measured. The variables of support for climate change mitigation policies could add or use other measurements, rather than policies only on taxes or subsidies. The dependent variable was in this study combined as an index. Research could also rather analyze these policies independently and understand if there is a difference in attitudes towards taxes and subsidies or other mitigation policies.

The consequences of climate change are global, it is therefore, necessary for governments to take actions to address these problems. European countries have had the ambition of implementing progressive climate policies, these actions cannot be fully implemented successfully without strong public support. Authorities should therefore aim to promote social capital to encourage people to develop an environmental perspective. This could potentially increase positive perceptions of climate change mitigation policies. This study has been trying to understand how social dimensions explain these different perceptions. It must be recognized that ideas are perceived differently by different groups. These social processes and interactions understood through the theoretical framework of social capital have shown that these add value to our understanding of these dimensions. The mitigation processes need to

resonate with public norms to be implemented effectively with synergy between the state and the public. This will promote social learning and develop the willingness to collectively act. To convince the public of policy measures for mitigation of climate change is a necessity. It is an essential part of generating sustainable development and a resilient society. It is therefore important to understand how different subjective perceptions are inherited, to be able to deal with them.

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9 Appendix

Table 4

The items of Self-transcendence vs. Self-enhancement and Conservation vs. Openness-to-change

Self-transcendence vs. Self-enhancement

- She/he thinks it is important that every person in the world should be treated equally. She/he believes everyone should have equal opportunities in life.
- It is important to her/him to listen to people who are different from her/him. Even when she/he disagrees with them, she/he still wants to understand them.
- She/he strongly believes that people should care for nature. Looking after the environment is important to her/him.
- It is very important to her/him to help the people around her/him. She/he wants to care for their well-being.
- It is important to her/him to be loyal to her/his friends. She/he wants to devote herself/himself to people close to her/him.
- It is important to her/him to show her/his abilities. She/he wants people to admire what she/he does.
- Being very successful is important to her/him. She/he hopes people will recognise her/his achievements.
- It is important to her/him to be rich. She/he wants to have a lot of money and expensive things.
- It is important to her/him to get respect from others. She/he wants people to do what she/he says.

Conservation vs. Openness-to-change

- She/he believes that people should do what they're told. She/he thinks people should follow rules at all times, even when no-one is watching.

- It is important to her/him to live in secure surroundings. She/he avoids anything that might endanger her/his safety.
- Having a good time is important to her/him. She/he likes to 'spoil' herself/himself.
- She/he seeks every chance she/he can to have fun. It is important to her/him to do things that give her/him pleasure.
- She/he likes surprises and is always looking for new things to do. She/he thinks it is important to do lots of different things in life.
- She/he looks for adventures and likes to take risks. She/he wants to have an exciting life.