Social Trust & Climate Change

MSc thesis Public Administration | Avi Setz

Social Trust:
Its Effect on Individuals' Pro-environmental Behaviour to
Address Climate Change as the Ultimate
Tragedy of the Commons

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CHAPTER 1: INTRODUCTION

"…Fill the earth and subdue it; have dominion over the fish of the sea, over the birds of the air, and over every living thing that moves on the earth." Genesis 1:28

The Judeo-Christian story of the beginning of history starts with the perfect place, the Garden of Eden, and two imperfect people, Adam and Eve. It is a short story, packed with symbolic meaning and full of dilemmas mankind continues to grapple with to this day, involving issues of trust and the relationship between humans and their environment. The story paints a grim picture of how, in a garden of perfection with limitless resources, mistrust in the all-knowing and all-powerful source of life leads to the end of paradise, and the beginning of the flawed and limited world we live in today. So how can we, flawed humans, with limited knowledge, in this imperfect environment, trust each other enough to take care of the fragile environment around us, and its resources on which we all depend? These questions, and the Judeo-Christian story that prompts them, are of particular importance and increasing urgency in today's world. We are slowly but consistently destroying our own bountiful but not limitless Garden of Eden, and it is only by co-ordinated, joint effort that we will be able to save it.

In this thesis, the role of social trust in the facilitation of individual action towards the issue of climate change is examined with respect to the tragedy of the commons; a problem of trust and resource management almost as old as Adam and Eve. Social trust can be defined as the generalized trust a person has in individuals outside of their in-group (Weber & Carter, 2003; Delhey & Newton, 2003). Commons are resources that are shared by all members of a society, such as water, air, fishery and grazing areas. These are resources that all individuals have an interest in maintaining, because everyone uses them. The tragedy of the commons arises when individuals start exploiting resources at unsustainable levels for their own personal short-term gain even though they have long-term interest in maintaining them (Rothstein, 2005). Climate change is one of the most important social problems of this generation, as well as one of the most politically explosive problems (Whitmarsh, O'Neill, & Lorenzoni, 2011), precisely because of the way it maps onto the tragedy of the commons.

In order to address the complex relationship between social trust, limited resources and climate change, the foregoing research builds upon a large body of academic works that mainly comes from three different concepts and a variety of academic disciplines. The first concept is the tragedy of the commons, a term which was coined by Garret Hardin, an ecologist, and later referred to as the 'governing of the commons' by Elinor Ostrom, a political economist. The second is social trust, which builds upon the work of political scientists such as Bo Rothstein, Robert Putnam and Eric M. Uslaner. The third is pro-environmental behaviour, which builds upon the work of multi-disciplinary environmental researchers such as Paul C. Stern, Anja Kollmuss and Julian Agyman.

In his famous essay, Garret Hardin (1968) claims that, with a rapidly growing population, the tragedy of the commons cannot be solved through mere consciousness of the issue. Hardin coins his theory 'the tragedy of the commons', to underline the tragic outcome humans often face when dealing with shared resources. For the sake of consistency and clarity, this thesis will henceforth use Hardin's terminology 'the tragedy of the commons'.

The tragedy of the commons is often seen as a game theory problem (Rothstein, 2005). If the individuals that share a common-pool resource act strictly according to self-interest, everyone is worse off in the end (Ostrom, 2002). For example, I as a human being living on planet Earth have an interest in keeping water and air clean. However, if I do not believe others will limit their electricity use or throw their

garbage in the bin instead of leaving it behind, it is not rational for me to be the sole person caring for the environment and bearing the cost that is associated with it. This means that the Nash equilibrium for the tragedy of the commons is to not cooperate with one another, which is the most usual outcome (Rothstein, 2005).

Elinor Ostrom, on the other hand, contests Hardin's pessimistic outlook. Hardin bases his theory of the tragedy of the commons on the theory of maximization (1968), which claims that individuals always seek to maximize their benefit. Ostrom, however, criticizes the theory of maximization as not accurately predicting real life outcomes. Ostrom finds that there are multiple cases which contradict Hardin's theory and manage to overcome the tragedy of the commons. In order to explain why, in certain cases, the tragedy of the commons is overcome, research from disciplines other than economics, such as psychology, sociology and political science was introduced (Rothstein, 2005). This new and expanded research suggested that one of the potential answers to the tragedy of the commons is social trust. The definition of social trust is a "bet on the future contingent actions of others" (Sztompka, 1998, p. 21). This is a common definition that both Bo Rothstein (2005) and Ostrom (2002) use. Ostrom (2005) also expands on this definition by adding that trust is not reducible to interest that is based on instrumental calculations. Other researchers refer to the concept of social trust as generalized trust, which, as noted before, is trust of others who are not in the individual's in-group (Weber & Carter, 2003; Delhey & Newton, 2003).

Social trust is an important and central element in a "complex and virtuous circle of social attitudes, behaviours, and institutions that act as the foundation for stable and effective democratic government" (Zmerli & Newton, 2008, p. 706). There are two ways in which social trust has an impact on the tragedy of the commons. The first is by facilitating collective action and communication between individuals (Ostrom, 2015, p. 306), and the second is by promoting individual action towards the tragedy of the commons (Barclay, 2004). The impact of social trust on individual action on the tragedy of the commons is built on the assumption that when an individual has more trust in others, they are more likely to trust other individuals to act upon the tragedy of the commons. This reduces their fear of having the burden of the cost associated with their action, and it increases the likelihood that the individual will take both individual and collective action. The tragedy of the commons frames social trust in the broader theory of collective action. This is found in the works of researchers such as Rothstein (2005), who suggests that social trust is a possible answer to the tragedy of the commons. This is explained by showing that trust gives political institutions social capital, which they can use to fix the tragedy of the commons. This idea is seconded by Uslaner (2002), who explains in his book that social capital complements other tools used by institutions to solve the tragedy of the commons, in all its different iterations. It must be noted though, that this is not being tested on such a large scale as climate change, because it is extremely complicated to evaluate the effects of collective action on a global level. It is even questionable whether effective collective action is even possible on such a large scale. Thus, the tragedy of the commons does not provide a framework for understanding or testing collective action on that scale. The second way in which social trust influences the tragedy of the commons of climate change is by increasing the likelihood for individual action. This assumption is tested by Barclay (2004), who shows that social trust of the individual helps to overcome the tragedy of the commons. In this study, the causal effect found in Barclay's study will be tested using the following research question:

What is the impact of social trust on an individual's intent to deal with the tragedy of the commons?

As explained above, the concept of the tragedy of the commons does not provide an adequate framework for understanding and testing individuals' actions towards large scale instances of the tragedy of the commons, such as climate change. Therefore, in order to understand the impact of social trust on individuals' behaviour, I will use the concept of pro-environmental behaviour. This concept dates back to the early 1970s and originates from the field of environmental and behavioural psychology (Kollmuss & Agyeman, 2002, p. 240). It will provide a suitable framework to analyse how values, beliefs and attitudes lead to pro-environmental behaviours. This framework will help to provide an understanding of how social trust impacts pro-environmental behaviours and how the impact can be tested. It is also important to note, though, that social trust is a belief, and beliefs have been shown not to impact individuals' pro-environmental behaviour directly. Rather, they are necessarily mediated by a sense of obligation and responsibility for the environment and climate change (Stern, 2000).

The goal of this thesis is to estimate the effect that social trust has on individual pro-environmental behaviour. To measure this effect, I will test to what extent personal responsibility for climate change is a mediator between social trust and pro-environmental behaviours. Additionally, I will consider the context of those relationships to determine whether level of education, religiosity and the belief about the cause of climate change moderate the impact of social trust on the feeling of responsibility for climate change. Finally, I will explore whether the type of welfare state changes the relationship between the feeling of responsibility for climate change and pro-environmental behaviour.

The research in this thesis adds to the existing literature in three different ways. Firstly, cultural theory has been proved to make a significant contribution to limiting the magnitude of climate change by improving understanding of human behaviours that drive climate change and human reactions to climate-related technologies and policies (Stern, Contributions of Psychology to Limiting Climate Change, 2011, p. 303).

Secondly, most of the research done on social trust and the tragedy of the commons has been done in experiments only on an individual level, or as case studies (Barclay, 2004; Rothstein, 2005; Ostrom, 2005). This thesis, by contrast, will take the causal effect that was found in those studies and will test it using the ESS database that includes 23 countries and 43,350 observations. This will also make the results found in the experiment (Barclay, 2004) and in case studies (Ostrom, 2015; Putnam, 1993; Ostrom, 2015) generalizable.

Finally, this thesis will add to the existing literature by expanding its scope from a more local example of the tragedy of the commons to a global example of the tragedy of the commons. Ostrom's work (2002) focuses on more localized commons, where individuals have the ability to communicate and collaborate. This led to academics criticizing her research (Rothstein, 2005) by claiming that the conclusions she reached regarding local commons cannot be generalized to larger issues, such as climate change. They argued that, unlike with local cases of the tragedy of the commons, when dealing with global cases of the tragedy of the commons, individuals cannot communicate with each other, and there are far more obstacles in the way of collaboration. This study addresses this issue by using a different concept, pro-environmental behaviour, to provide the framework in which the impact of social trust on individual behaviours can be measured and understood. It also addresses the weakness of using the concept of pro-environmental behaviours. The concept was originally intended to be used solely to analyse the individual, without assessing the social and political context.

CHAPTER 2: LITERATURE REVIEW AND THEORY

This chapter contains a literature review of the following concepts: social trust, the tragedy of the commons, and welfare regimes. Based on the literature, hypotheses will be derived that will be used to answer the research question.

2.1 LITERATURE REVIEW

2.1.1 THE TRAGEDY OF THE COMMONS

In a seminal essay in 1968, ecologist Garrett Hardin (1968) brought renewed attention to an increasingly urgent dilemma, which he coined the "tragedy of the commons" (1968, p. 1244). In the tragedy of the commons, the commons are defined as shared resources, which everyone is allowed to use freely while simultaneously having an interest in not depleting (Rothstein, 2005, p. 48). Unlike previous scholars, Hardin uses a rational choice approach to address this dilemma, which is based on the fundamental assumption that each individual seeks to maximize their gain (utility). Specifically, he applied the Prisoner's Dilemma (Hardin, 1968, p. 1244), which proposes that, in the short term, the players gain more by not cooperating with each other, rather than by cooperating with each other. This creates a situation in which, in the long term, everyone loses due to lack of a cooperative strategy (Rothstein, 2005, p. 48). Hardin was not the first to address this issue; However, his provoking articulation of the issue, in combination with rising concern about human impact on the environment and overpopulation, as well as his controversial solution of population control, have made his essay a lightning rod for debate (Rothstein, 2005).

Hardin (1968) used the Prisoner's Dilemma to explain that the individual player has no power, since he will always choose noncooperative strategies. This is despite the fact that it is in the player's best interest in the long term to cooperate. The solution that he proposes, therefore, is coercion by the state in the form of rules and taxation in order to institute population control. Hardin believes that this extreme solution is necessary in order to ensure that conscientious individuals continue to procreate. This is based on Hardin's theory that individual action is in fact counterproductive. He posits that, if individuals who are concerned about conserving resources voluntarily decide not to have children, the most desirable genes (those of conscientious, intelligent citizens) will not be passed down to future generations. Therefore, the best solution according to Hardin, is population control by the state (Hardin, 1968). Hardin's article started a long academic debate about the nature of the tragedy of the commons, which continues to this day (Rothstein, 2005; Putnam, 1993; Barclay, 2004; Ostrom, 2015).

One of Hardin's main critics has been Elinor Ostrom (2015), a leading political economist in the study of the tragedy of the commons in recent years. She received a Nobel Prize in 2009 for the groundbreaking research presented in her book 'Governing the Commons', which addresses the same dilemma concerning the commons as Hardin. Ostrom claims that, in the real world, outside of the confines of theoretical models, using either coercion by the state or market forces on their own, fails to address the tragedy of the commons effectively. A study by political scientist Bo Rothstein came to similar conclusions, which show that centralized regulations tend to fail when addressing the tragedy of the commons (Rothstein, 2005, p. 48). Ostrom also gathered empirical evidence which shows that in the real world, people who are not coerced by the government make their own rules and managed to extricate themselves from the tragedy of the commons (Ostrom, 2015). This finding led Ostrom to research why the outcome of the tragedy of the commons differs so drastically from case to case, and

why some manage to escape the laws of the tragedy of the commons, while others end up tragically depleting the common resources they depend upon.

Ostrom (2015, p. 40) criticizes the rules of the game that Hardin sets, whose premises are that there is complete information, no communication between individuals, and maximization of utility is regarded as a purely economic matter. Ostrom maintains that these rules do not match up to reality. Furthermore, the solution that Hardin (1969, p. 1245) suggests, namely, coercion by the state, is also strongly criticized by Ostrom. She points out that there is no consideration of the cost of such overarching organization. Nor is there adequate consideration for the accuracy of information, or monitoring capabilities, or the extent to which the state is practically able to exert their coercive powers (Ostrom, 2015, p. 57).

The alternative solution that Ostrom (2015) suggests in her book is a complex and all-encompassing theory. She believes that the best course of action is to consider each instance of the tragedy of the commons separately, rather than implementing one overarching institutional solution. She claims that although institutions and market forces are key actors for solving the tragedy of the commons, the individuals sharing the commons often have the capacity to extricate themselves from the problem. She argues that it is neither helpful nor pragmatic to view the human race as a collection of helpless individuals stuck in a tragedy (Ostrom, 2015, pp. 6769). The solution, therefore, must include a mix consisting of the market, the political institutions and the individual, and each case will require a different balance of these three elements (Ostrom, 2015, pp. 7072).

Although Ostrom's solution above is valid, it is less helpful when building theoretical models. In academia, one of the objectives is to extract the essence of real-life situations and build an abstract model that can predict real life situations to a satisfying degree over several different instances, rather than simply saying that every situation is unique. Ostrom does address this, however, and adds different elements to the existing game (Ostrom, 2015, p. 74). One important addition to the theory is the new focus on the individual, and the changing rules of the game in which individuals can communicate with each other, build trust and work on longterm goals rather than -shortterm- goals (Ostrom, 2015, pp. 88-89). It complements the focus on an institutional solution and the use of market forces.

In order for those individuals to cooperate with each other in the long-term, forgoing the short-term benefit of non-cooperation, trust is essential. In the end of Ostrom's book, 'Governing of the common' (2015, p. 306) she concludes that one of the best predictors for a group being able to overcome the tragedy of the commons is social trust amongst the individuals in said group. The importance of social trust in dealing with the tragedy of the commons has been repeated in the conclusion of other academics as well (Kollock, 1998; Barclay, 2004; Rothstein, 2005; Delhey & Newton, 2003).

2.1.2 SOCIAL TRUST

The concept of social trust has been borrowed from the discipline of sociology and psychology. This approach of borrowing different concepts to deal with such issues as the tragedy of the commons has been used to offer more realistic assumptions about human behaviour. Social trust in the context of political science and public administration has been used to compliment the rational utility maximization that is a main principle of the rational choice approach (Rothstein, 2005, p. 36). The models that are set forth by the rational choice approach have been proven to be very useful for understanding different issues and systems but have been bad predictors of what actually happens in real life.

There are two orientations toward trust. The first one is coined as particularized trust: the in-group, family, friends or people with whom one shares a valuable common denominator (Uslaner, 2002, p. 2). This also means distrust in people that are not in that in-group. This type of trust is often linked to a negative view of the future and one's own ability to influence the direction of one's own life and society (Rothstein, 2005, p. 56). The second orientation that is underlining this study is generalized trust, which is also called social trust (Uslaner, 2002, p. 2). This trust is not directed at a particular group, but rather, it is a belief that most other individuals can be trusted independently of the people's experience about the trustworthiness of the other (Rothstein, 2005, p. 57).

Social trust is more specifically defined as a "bet on the future contingent actions of others" (Sztompka, 1998, p. 21). This bet is based on the perception that one has of others and their action, meaning that it is not blind faith, but rather a calculation made on acquired information. This has been shown in a study, which found that social trust is based on information we gain through direct personal experiences and other means (Delhey & Newton, 2003). However, it is not just a rational, instrumental calculation of the information as has been shown in field studies, experimental approaches and large-N designs (Sally, 1995; Ostrom, 2015; Uslaner, 2020; Rothstein, 2015). Additionally, social trust has been found to be highly stable and extremely difficult to change (Rothstein, 2005, p. 21).

There are two different approaches to social trust. One approach to social trust is that social trust is a core personality trait that is learned early in life. It can change slightly and can be shaped by social and demographic features such as level of education, income and age, but overall, it appears to remain largely stable (Delhey & Newton, 2003, p. 94). A second major approach is to view social trust from the perspective of society and not that of the individual. This would mean that trust is formed by society and political institutions that are facilitating the development of trusting attitudes and behaviours (Delhey & Newton, 2003, p. 96). Social trust is also seen as changing society and political institutions and shaping them in a particular direction (Putnam, 1993; Rothstein, 2005). These two approaches complement each other. The individual theories explain the variation between individuals in the same societal and institutional context, and the societal theories explain the variation in social trust between countries.

There are two ways social trust is believed to influence issues such as tragedy of the commons. The first is by constituting a part of social capital. Social capital is the "features such as norms, trust and networks that improve efficiency and effectiveness by facilitation of coordinated actions" (Putnam, 1993, p. 167). Social trust is a core component of social capital and is often the best indicator for social capital (Delhey & Newton, 2003, p. 94). Therefore, the idea is that by having more social trust, social capital increases and there is a higher chance for collaborative action and mobilization by institutions.

The second way trust is believed to influence the tragedy of the commons is that it addresses the individuals that make up the group that makes use of the common-pool resource. Social trust can help individuals focus on the long-term collaboration instead of the short-term collaboration; it can help with communication and organization.

2.1.3 PRO-ENVIRONMENTAL BEHAVIOUR

Commons-pool resources take many forms, from common grazing areas, to fishery to climate. This thesis focuses on the tragedy of the commons that has become increasingly apparent, which is climate change. Although the climate is continuously shifting, in the recent past, it has become apparent that humans have a considerable impact on the climate which will have disastrous consequences for the

Earth and for humans themselves. Human actions have been a cause for climate change, thus in order to stop the trajectory humanity is set on, or to at least mitigate the impact, human behaviour must change. Changes in behaviour have major potential to reduce the magnitude of climate change (Stern, 2011). These actions are called pro-environmental behaviours.

According to Stern (2011, p. 303), pro-environmental behaviours are influenced by "human attitudes, predispositions, beliefs and social and economic structures". This does not mean that industry and governance do not have a role, rather that when looking at the individual level, human attitude and belief matter. For example, in the United States, 38% of carbon dioxide emissions are directly linked to energy use in households (Stern, Contributions of Psychology to Limiting Climate Change, 2011, p. 304). Different researchers have found that information, awareness and good intent do not lead to more climate action (Hungerford & Volk, 1990, p. 267; Hungerford & Volk, 1990; Stern, Contributions of Psychology to Limiting Climate Change, 2011) . This is why well-designed policies are important to guide action on climate change. A well-known typology of those interventions is command and control, economic instruments, changes in infrastructure, institutional arrangements and communication and diffusion methods (Stern, 2011). But for those policies to function, the implicit assumptions about human behaviour that are contained in the policy have to be correct. What is often seen is that there is a gap between what the models' policies are based on predict and what happens in real life (Kollmuss & Agyeman, 2002).

In opposition to the tragedy of the commons, which is mainly focused on collective action as a solution, this line of research is much more focused on individual behaviour. The underlying reason for this is mainly rooted in the environmental and behavioural psychology field of the 1970s, where explicit focus on individual behaviour was of key importance. The early models, such as the US linear model, were simple and often considered awareness to be a direct cause of pro-environmental behaviours. Those were proved to be entirely wrong and there seemed to be a gap between attitude and behaviour (Kollmuss & Agyeman, 2002, p. 241). This gap has led many researchers to try to explain what influences pro-environmental behaviour (Stern, 2011). In his paper, Rajecki (1982) explained the existence of this gap with four different points, with two of them related to the way in which research is undertaken. Firstly, attitude-behaviour measurements were often not significantly linked; they were either too narrow or too wide. Secondly, the author defined temporal discrepancies, which refer to attitudes of individuals changing over time. This made it more difficult to test theories and replicate previously published research because attitudes end up evolving over time. Additionally, when data collection on action and attitudes were considered separately, it yielded different results. The other two points are related to the causal link itself. Firstly, direct experiences have much stronger influence on behaviour rather than indirect experiences. For example, a professional fishermen whose catch is diminishing every year is much more likely to actually act upon their concern for the ocean ecosystem compared to, for instance, lawyers. This is regardless of whether or not the fishermen and the lawyers report similar attitudes about caring for the ocean ecosystem. Secondly, normative influences, such as social norms, cultural tradition and family customs, influence and shape individuals' attitudes. These normative influences can either widen or lessen the gap between attitude and action (Rajecki, 1982).

These above findings led to more sophisticated models by social psychologists. One of the more noteworthy models is by Ajzen & Fishbein 1980, which has been the most influential model because they developed a mathematical equation that allowed other researchers to replicate the model, test it and develop it further (Kollmuss & Agyeman, 2002, p. 243). Building on that model, in 1987, Hines and Hungerford did a meta-analysis of variables that were connected to pro-environmental behaviours and

found that knowledge of the issue, the locus of control, attitudes, verbal commitment, and a sense of individual responsibility were highly associated with pro-environmental behaviour (Hines, Hunderford, & Tomera, 1987, p. 7). This research was replicated twenty years later, when it confirmed and solidified the idea that intentions for pro-environmental behavioural mediate the impact of all other psycho-social variables on pro-environmental behaviour (Möser & Bamberg, 2007, p. 21). An additional model that has also become a classic is a model by Hungerford and Volk (1990) that addresses the gap by emphasising that knowledge about the issue and awareness are not enough to explain pro-environmental behaviour. Individuals have to develop a sense of "ownership and empowerment" and be fully invested (Hungerford & Volk, 1990, p. 267).

These models became quite complex and expanded over the years, creating a developed body of work focused on pro-environmental behaviours. In their research paper titled "Mind the gap", Kollmuss and Agyeman (2002) summarize the commonalities, contradictions and omissions of the models between 1970 and 2000. One of their main criticisms of the older models was the focus on internal causes for individuals' behaviours. This is due to most of the researchers being social-psychologists, neglecting societal and external factors that influence pro-environmental behaviours. Kollmuss and Agyeman addressed this by dividing the existing variables from the different models into demographic factors, external factors and internal factors (Kollmuss & Agyeman, 2002, p. 252). This step has been important since it opened up the model for other disciplines such as sociology, political science and public administration. The issue with the model they created was that although the distinctions between the more then fifteen different groups of variables is useful, it makes the model less useful to explain causality and almost impossible to test. In their article, they criticize the other models for the same reason, explaining that creating a model that perfectly explains pro-environmental behaviour with all its nuances is "neither feasible nor useful" (Kollmuss & Agyeman, 2002, p. 256).

The problem of explaining the causality in the models has been addressed by several researchers. Stern (2000) draws a causal chain together with other researchers that is based on empirical data from the previous work of "Black et al., 1985, Gardner & Stern, 1996; Stern, Dietz & Guagnano, 1995; Stern, Dietz, Kalof & Guagnano, 1995; Stern & Oskamp, 1987". This is a widely used causal chain model that helps understand the causal links that lead to pro-environmental behaviours and is the underlying causal mechanism for understanding pro-environmental behaviours.

Figure 1
Value-Belief-norm (VBN) – causal chain
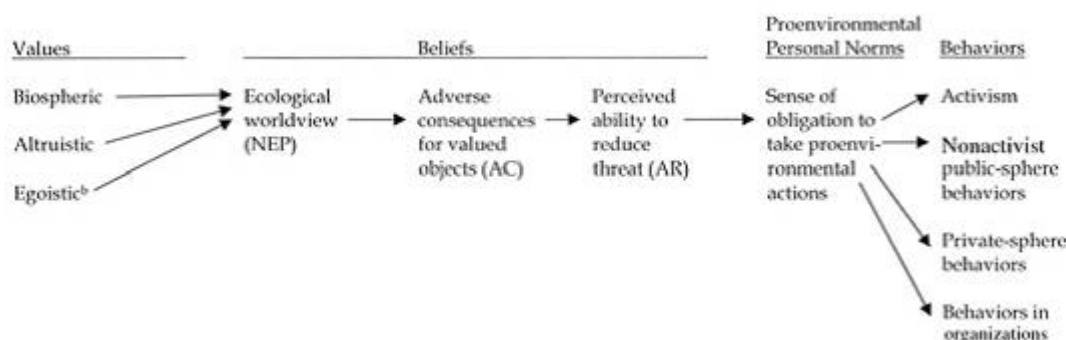
NB: Adapted from *Toward a Coherent Theory of Environmentally Significant Behaviour* by Stern, 2000, p. 412.

To summarize, pro-environmental behaviours have proven to be difficult to explain, but decades of research have given some insights that are helpful in understanding the causal mechanism for pro-environmental behaviours, and the gap between awareness regarding the environmental issues and the behaviour to address those issues. Additionally, to the personal individual causal mechanism that most models focus on, it is important to view the context and external environment in which the process takes place. This is especially true since individual motives only make up a part of the reason for pro-environmental behaviours. When comparing the differences between the field of study regarding pro-environmental behaviours and the tragedy of the commons, there are a few substantial differences. The research field of the tragedy of the commons has been shaped mainly by economists, whereas the field of pro-environmental behaviours has been mainly shaped by psychologists. Since the beginning both fields of study have developed and expanded into many more disciplines, but the roots are still apparent. In this field of study, the models are often focused on game theory and economic models, and the perspective that it takes is more global and is related to the systems and institutions in place. The individuals are merely a part of those systems and institutions, or they are a simplified player in a game that just seeks to maximize utility. In the field of study of pro-environmental behaviours, the perspective is different. The focus in the first few decades is almost entirely on the individual and the processes happening within the individual. Here, the individual is an extremely complicated entity, with a complex set of motives, values and beliefs that are often contradictory and not always rational. These two approaches both have merits and complement each other to some degree. Individually, they are often criticized for lacking what the other includes.

2.1.4 WELFARE REGIME

One theory that is useful for comprehending the contextual differences amongst countries with regards to pro-environmental behaviour is the 'three worlds of welfare capitalism' theory of Esping-Andersen (1990). The theory suggests that there are similarities between groups of countries based on their welfare regime. The countries are organized into these groups in order to explain the differences between countries with respect to concepts such as responsibility for climate change, social trust, and pro-environmental behaviour. Welfare regime is determined according to three different dimensions: distribution and production of welfare, direction of social policy, and construction of social insurance systems (Rostila, 2007, p. 224). The different types of welfare regimes should, however, be understood as ideal types only.

Espring-Andersen's (1990) original theory included three different regimes. The first one, *liberal regime,* includes countries such as United Kingdom and Ireland, in which the state encourages the market, and there are modest social-insurance plans and means tested assistance. These countries mostly have higher levels of income inequality compared to the countries in the other regime categories. The second regime type, c*onservative-corporatist,* includes France, Belgium, Switzerland, Estonia, Austria, Netherlands and Germany. In these countries, the state is minimally involved in welfare schemes, as it is understood to be the responsibility of the family and/or the individual (Rostila, 2007, p. 224). The state steps in only when the individual and family capabilities and resources are exhausted. These countries are more equal than the liberal regimes, but nonetheless still result in substantial inequalities; in these countries an individual's welfare and security are dependent on one's status and earning capabilities, or family wealth. The third regime is the s*ocial democratic regime,* which includes the countries Sweden, Norway, Iceland and Finland. These countries support and balance the interests of

both the market and the family unit. These countries have universal social benefits and high levels of social security, which leads to lower levels of inequality and less poverty (Rostila, 2007, p. 224).

There is also a fourth regime, which was added at a later date, but is important to include here. The fourth regime is called the *Mediterranean regime*, and includes countries such as Italy, Spain, Portugal, Israel and Greece. This type of regime relies more on the family unit and community for the provision of social benefits. These countries have higher levels of inequality compared to the welfare regimes listed above (Minas, Jacobson, Antoniou, & McMullan, 2014). Rostila (2007) adds an additional fifth regime, the *post-socialist regime,* in order to address Central and Eastern European countries that did meet the criteria for the first four regimes. However, this regime type poses some problems, as it is under-studied relative to the other regimes, and there are greater discrepancies amongst these Central and Eastern European countries. The countries which fall under the category of post-socialist regime are Hungary, Lithuania, Russia Federation, Slovenia, Czech Republic and Poland. These countries are characterised by a high dependency on the family unit and local community for their welfare, which leads to high levels of poverty and inequality.

2.2   THEORY

This section outlines the assumptions that are underlying the conceptual framework in Figure 2. Those assumptions are based on the literature review and are used to create hypotheses that are tested in the analysis chapter (Chapter 4). The mediation triangle that is the base of the conceptual model is based on the causal chain model by Stern (2000), which explains the causal relation of social trust with pro-environmental behaviours. The causal model that is illustrated in Figure 1 explains that the relationship between belief and pro-environmental behaviour is mediated by the personal norms of feeling responsibility for assuming pro-environmental behaviours. Social trust is a belief and attitude, meaning that to understand the impact it has on pro-environmental behaviour, it is important to see how responsibility mediates between social trust and pro-environmental behaviour. The other variables that are listed in Figure 2 are moderating variables that explain the change in relationship depending on when and who is addressed. This is based on the model of Kollmuss and Agyeman that addresses the relationships by dividing the existing variables into two main categories: External factors and internal factors (Kollmuss & Agyeman, 2002, p. 252), in which education and welfare regime are external factors and belief in cause of climate change and religion are internal factors.

Figure 2
Conceptual framework
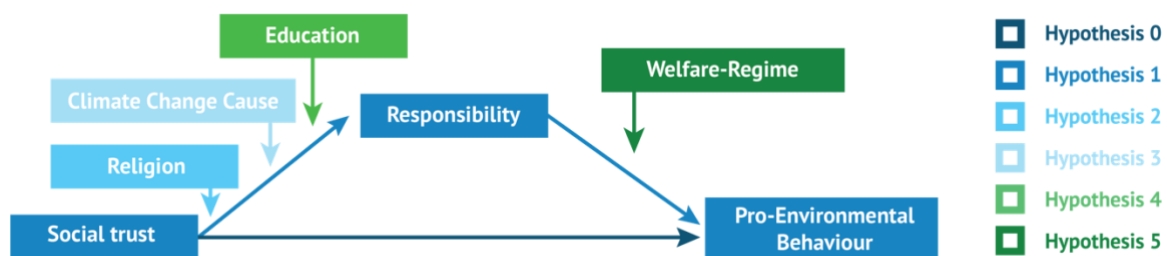
After looking at the tragedy of the commons and social trust, it is time to look at the relationship between the two. Social psychology has been seen by many as a tentative solution to averting the Tragedy of the Commons and the problem of the free-rider (Van Vugt, 2009; Ostrom, 2015; Putnam,

1993). Based on existing literature, and his study about social trust having a positive impact on the problem of corruption, Rothstein (2005) assumes that social trust will also have a positive impact on the tragedy of the commons. This is because the issue he defines is similar to the Prisoner's Dilemma, which is set in the tragedy of the commons. In an experiment, Barclay (2004) tests this relationship to consider if, in a trust game, increased social trust will lead to a better outcome with the tragedy of the commons. The results show that there is indeed a causal relationship between social trust and behaviour to deal with the tragedy of the commons (Barclay, 2004). This is also hypothesised by Ostrom (2015). Therefore, I will expect the following:

> H0 – Social trust positively impacts pro-environmental behaviour

When looking at the causal chain developed by Stern (2000) that comes from the pro-environmental behaviour research, attitudes and beliefs do not influence behaviour directly, but are rather mediated by the personal norm of having a sense of responsibility to exhibit pro-environmental behaviours (Stern, 2000; Hungerford & Volk, 1990; Hines, Hunderford, & Tomera, 1987). Therefore, a partial mediation is expected:

> H1 – Sense of responsibility for the climate change mediates the positive impact of social trust on pro-environmental behaviour.

In order to better understand the relationship between social trust and the sense of responsibility for climate change, I am going to consider three different potential moderators to demonstrate when and for whom the relationship is either positive, not significant, or negative. The first is religion, which has a peculiar effect on the relationship between social trust and addressing the tragedy of the commons. On the one hand, several studies show that religion is a high predictor of social trust. For instance, being a protestant Christian in Europe was found to be one of the strongest predictors of having high levels of social trust in Europe (Rothstein, 2005). The relationship with ecology and the responsibility for climate change is more difficult to determine, however, as climate scepticism is strong in some denominations, whereas other denominations feel a strong responsibility for the environment (DeLay, 2014; Shaefer, 2016). Setting aside the complexity in the effect each denomination and religion has on the relationship, we expect general religiosity to have a positive moderation:

> H2 – Higher levels of religiosity positively moderates the impact of social trust on the sense of personal responsibility for climate change.

An additional moderator is the belief that climate change is caused either by human activity or by natural processes. This relationship is hypothesised because people who believe climate change is caused by humans and display a high degree of trust are more likely to act upon that belief and take action. On the other hand, if an individual displays a high degree of trust, but believes that climate

change is caused by natural processes, they might not feel personally responsible to act on issues regarding the climate since it is out of their control. This leads to the following assumption:

H3 – The belief that climate change is caused by humans positively moderates the positive impact of social trust on sense of personal responsibility for climate change.

Another moderator is the level of education. Although there is no research on the relationship between education, social trust and pro-environmental behaviour, there is extensive research on the effect of education on social trust and pro-environmental behaviour respectively. Many different academics found a stronger relationship between highly educated individuals and their attitude towards pro-environmental behaviours than individuals with lower levels of education (Whitmarsh, O'Neill, & Lorenzoni, 2011; Echavarrena & Telešienė, 2019) and their levels of social trust (Rothstein, 2005; Uslaner, 2010). People with college level education and above were found to be 11% more likely to reduce their energy use. (Semenza, et al., 2008). The causal mechanism behind this relationship is due to educated individuals having more access to, and greater understanding of, scientific research on environmental issues. (Echavarrena & Telešienė, 2019). In the case of education and social trust, one study shows that an individual's perception of cultural and social structures explains 77% of the causal effect of social trust on education (Huang, van den Brink, & Groot, 2011, p. 287). In a factor analysis, education was one of the strongest factors associated with social trust (Borgonovi, 2012, p. 147). In another study, this association was tested, and education was found to increase the probability of social trust by 16%. More specifically, one additional year of schooling increases social trust by 4.6% (Huang, van den Brink, & Groot, 2011, p. 189).

The hypothesis is that the higher the level of an individual's education, the stronger the relationship will be between social trust and pro-environmental behaviour. This is because more highly educated people are better able to understand complex and abstract problems (Weber & Carter, 2003). Ability to engage in abstract and complex reasoning allows them to see that, if they do not lead the way with pro-environmental behaviours trusting that others will follow, the tragedy of the commons will remain. This assumption underlies the following hypothesis:

H4 - Higher levels of education positively moderates the impact of social trust on sense on personal responsibility for climate change.

So far, all the hypotheses have addressed individual-level moderators, or as Kollmuss and Agyeman (2002) call them, internal factors. Analysing internal factors that influence the relationship helps us to understand why different people in similar circumstances have different outcomes; for example, why there is variation in outcome in a certain country. Internal factors, however, do not explain why countries, or groups of countries, differ from each other. Nor do they explain, for example, how the context in which an individual lives, influences the relationship between sense of responsibility for climate change and pro-environmental behaviour. To understand the contextual difference, the following hypothesis focuses on the external factor of welfare regime. The hypothesis concerns the

relationship between sense of responsibility for climate change and pro-environmental behaviour as seen in Figure 3.

Figure 3

Conceptual framework highlighting the moderation hypothesis on the relationship between the sense of responsibility for climate change and pro-environmental behaviour
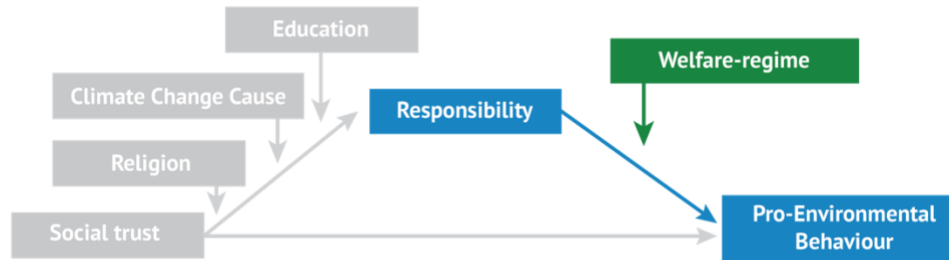
Previous research found that welfare regimes have a contextual effect in several areas such as health, social trust and responsibility for climate change (Putnam, 1993; Rostila, 2007, p. 235; Ostrom, 2015; Rothstein, 2005). In this study, I assume that welfare regimes will also have a contextual effect on the relationship between a sense of responsibility for climate change and proenvironmental- behaviours. In other words, depending on the levels of welfare, the relationship between the two variables (responsibility for climate change and pro-environmental behaviours) will change. It is assumed that high levels of welfare positively moderate the relationship, because there is a strong relationship between societies that are more egalitarian, and responsibility for climate change and proenvironmental- behaviour (Whitmarsh, O'Neill, & Lorenzoni, 2011; Rothstein, 2005). It can therefore be assumed that welfare regime could moderate between the sense of personal responsibility and proenvironmental- action:
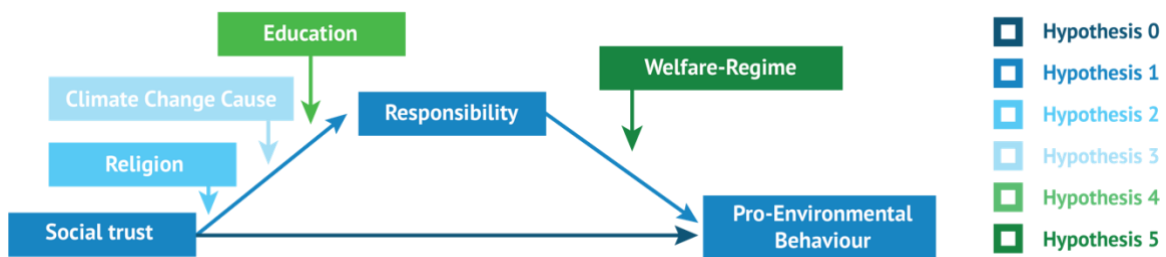
H5 – Higher levels of welfare positively moderate the impact of sense of personal responsibility for climate change on pro-environmental behaviour.

Figure 4

Conceptual framework

CHAPTER 3: RESEARCH DESIGN AND MEASUREMENTS

This chapter explains the research design and operationalization of the different variables. It concludes with the limitations of the research design and measurements.

3.1 STUDY METHOD AND STUDY DESIGN

This study is a Large-N study that is based on existing data. The analysis is based on round eight of the European Social Survey (ESS) data that was collected in 2016 (ESS8-2016). Round eight was chosen because it had a detailed section of questions on climate change that is not available in other, more recent rounds. The ESS studies are academically driven, face-to-face interviews, which are multi-country and biennial. The advantage of the ESS database is that, thanks to the concerted effort made to ensure equality in random probability sampling, measurements, and translation, it is very useful for cross-national comparisons. Round eight covers 23 countries and includes both an extensive social trust measurement and climate change questions.

To test the hypothesis, multilevel analysis will be conducted using the open-source- R (4.0.2) and R Studio (1.3.1093). All the graphs and tables seen in the thesis were made entirely with R. The following packages were used: pacman, dplyr, ggplot2, essurvey, tidyverse, stringer, htmlTable, sjPlot, jtools, interactions, lavaan, semTable and stargazer (Hlavac, 2018).

3.2 INDEPENDENT VARIABLE

Social trust will be operationalized by combining three questions from the ESS database that all rate from 0-11 into a single variable. This highly validated three-item scale has been specifically designed to measure social trust and is widely used (Zmerli & Newton, 2008, p. 709; Delhey & Newton, 2003; Rostila, 2007; Uslaner, 2010; Dinesen & Sønderskov, 2015). This is called the social trust index (ISC) (Meulemann & Heiner, 2008, p. 169) which represents the core underlying dimension of generalized social trust (Zmerli & Newton, 2008). The three questions are:

- "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?" (An explanatory note was added to the term "careful." "Can't be too careful: Need to be wary or always somewhat suspicious.")

- "Do you think that most people would try to take advantage of you if they got a chance or would they try to be fair?" ("Take advantage: Exploit or cheat; fair: in the sense of treat appropriately and straightforwardly.")

- "Would you say that most of the time people try to be helpful or are they mostly looking out for themselves?" ("Helpful": The intended contrast is between self-interest and altruistic helpfulness.)

The first item was created by Elisabeth Noelle-Neumann in 1948 (Zmerli & Newton, 2008). It was originally a dichotomous item and was later transformed into an 11-point scale (Uslaner, 2010). It is often used alone to measure social trust. However, in 1956, Rosenberg added the second question, and in 1957 a third one for more reliability and validity. Principal component analysis showed that those questions performed the same way across all countries and "explained between 58 and 71 percent of variance" (Zmerli & Newton, 2008, p. 709).

3.3   DEPENDENT VARIABLE

To operationalize the concept of the tragedy of the commons, I have focused on the problem of climate change. Climate is a tragedy of the commons because the climate is a common resource that is essential for our long-term survival as human beings. Yet, because of individual and collective short-term gain, we find ourselves in a situation that is similar to the 'tragedy of the commons' that Hardin (1968) describes. Although there is a lot to be said about the role of institutions, rules, policy and governance in dealing with the tragedy of the commons, the focus of this thesis is the role of the individual to deal with the issue of climate change. The reason the focus is put on the individual is, firstly, because individuals are essential to the establishment and operation of all institutions, organizations, governance and policy. Secondly, as part of the social capital theory, individuals have the great power to mobilize, change policy direction and influence policy makers (Rothstein, 2005). Thirdly, in democracies, the individual has the power to elect politicians that will represent their interests. To explain the individual action, I use the field of study of pro-environmental behaviour that is focused on the actions of individuals.

Surveys can only measure intended pro-environmental behaviour, and not actual completed pro-environmental behaviour to solve the tragedy of the commons. Therefore, a proxy variable will be used that is based on the intended behaviour of the individual who is answering the question.

To operationalize the concept, I use the following item: "There are some things that can be done to reduce energy use, such as switching off appliances that are not being used, walking for short journeys, or only using the heating or air conditioning when really needed. In your daily life, how often do you do things to reduce your energy use?" (rdcner – ESS code for the variable). This item is an ordinal variable that exists out of 6 categories ('Never', 'hardly ever', 'sometimes', 'often', 'very often' or 'always'). This is an appropriate variable, because it measures intended action to reduce energy use. Reducing energy use is a practical action that can be seen as taking a step to deal with the tragedy of the commons. However, although it is a practical action to measure, reducing energy use is not necessarily directly related to an individual's intent to solve the tragedy of the commons, it could also be influenced by other factors, such as financial considerations. Choosing the right variable has been a problem for researchers studying pro-environmental behaviours. This issue is examined in the book '*Mind the Gap*' by Kollmuss and Agyeman (Kollmuss & Agyeman, 2002, p. 241), who explain how this is a frequent issue that arises in data-base research. The way the research in this thesis deals with the issue is by mediating the effect with responsibility from climate change. The mediation will help explain the relationship that exists between social trust and intended pro-environmental behaviour.

3.4   MEDIATING VARIABLE

To test responsibility for environmental issues, the following item was chosen: "To what extent do you feel personal responsibility to reduce climate change?" (ccrdprs– ESS code for the variable). This item was rated on an 11-point scale, from 'not at all' to 'a great deal'. This item uses the same scale as the social trust scale, which makes it more compatible. This variable is a great fit with the concept that Stern describes as a "sense of obligation for pro-environmental actions" (Stern, 2000, p. 241), a sense of obligation can also be understood as responsibility, and reducing climate change is the same as

pro-environmental behaviour but is even more specific for the case of climate change that is considered here.

3.5 MODERATING VARIABLES

For the second hypothesis, the moderating variable of level of religiosity is measured by the following question: "Regardless of whether you belong to a particular religion, how religious would you say you are?" (rlgdgr– ESS code for the variable). Response categories are an 11-point scale from 'not at all religious' to 'very religious'. Measuring religiosity this way is not the best way to measure the religious impact on social trust or the intention to deal with the tragedy of the commons, because previous research showed that different types of denominations and beliefs have different relationships to either concepts of social trust and the tragedy of the commons and the relationship between them. For example, it shows that one of the highest predictors of social trust is being a protestant in Europe (Rothstein, 2005). However, since the focus is on the relationship between social trust and action regarding the tragedy of the commons in multiple countries with countless denominations and religions, and because of the limited scope of this thesis, I chose a more simplistic variable. If religiosity is found to have a significant impact on the relationship, future research can examine a more extensive way to measure the religious impact.

For the third hypothesis, the variable belief that climate change is caused by humans is measured with a single item: "Do you think that climate change is caused by natural processes, human activity, or both?" (ccnthum– ESS code for the variable). This is a 5-category variable that ranges from 'entirely by natural processes' to 'entirely by human activity'. Even though the item is unidimensional, and the answers can mean different things for different people, it accurately measures the variable that is most important to this thesis.

For the fourth hypothesis, considering that different countries have different education systems with levels that do not always compare, the level of education will be measured by the number of years of full-time education completed. This will be measured by the following question: "How many years of full-time education have you completed?" (eduyrs– ESS code for the variable). This is not the most precise measure of level of education, since someone who stayed longer in high school can have as many years as someone completing a bachelor, or someone training at a vocational school that is the same length as a university degree. A more accurate measurement would be to closely analyse the levels of education in each country. However, due to the scope of this research and the complexity of a precise, comparable measurement between countries, I will not be comparing levels of education on a country-by-country basis. Instead, I will use number of years of education, which is a rough indication of the level of education the individual has acquired.

In the fifth hypothesis, the moderating variable consists of five categories of welfare state regimes that are based on the work of Esping-Andersen (1999) and (Rostila, 2007). The 'liberal' regimes of United Kingdom and the Republic of Ireland; the 'social-democratic' regimes of Sweden, Norway, Finland and Iceland; the 'conservative-corporatist' regimes of France, Austria, Switzerland, Belgium, Germany, Estonia and the Netherlands; the 'Mediterranean' regimes of Greece, Israel, Spain, Portugal and Italy; and lastly, the 'post-socialist' regimes of Lithuania, Hungary, the Czech Republic, Poland and Slovenia.

3.6   CONTROL VARIABLES

I added several covariates in my regressions to serve as controls for other factors that might affect pro-environment intended actions: gender, age and household income.

Table 1

Control variables

Variable	Variable code	Operationalization	Values
Gender	gndr	Dichotomous variable	Dichotomous "Male", "Female" or "no answer"
Age	agea	Age of respondent is measured by the question: "And in what year were you born?"	The value is the calculated age of the individual
Household income	hinctnta	Total household income is measured by the following question: "please tell me which letter describes your household's total income, after tax and compulsory deductions, from all sources? If you don't know the exact figure, please give an estimate. Use the part of the card that you know best: weekly, monthly or annual income"	The answer to this has been made comparable by ESS and calculated income has been put into ten different categories of income.

3.7   ANALYSIS

The analysis is divided into two parts. The first one includes the descriptive statistics of the various variables that are part of the hypotheses testing. The second part includes inferential statistics where the hypotheses will be tested, interpreted and analysed. In this section, the first step is to test the direct relationship between social trust and pro-environmental behaviour and secondly to conduct a mediation analysis. The mediation analysis selected is the product of coefficients by Mackinnon & Dwyer (1993), and will be based on the Sobel test. After testing the mediation effect, I will focus on the individual effects between social trust and responsibility and between responsibility and pro-environmental behaviour on country level. Separately from the mediation analysis, I will analyse each of the moderation effects individually. The idea is not to test all the relationships in the conceptual model together, but rather to verify how the moderating variables affect the different relationship and confirm whether they are indeed moderating variables.

3.8   RELIABILITY AND VALIDITY

In quantitative Large-N research, reverse causality is often problematic, and the issue arose in this study as well. This is addressed by basing this study on an existing experiment by Barclay that found a causal relationship between social trust and dealing with the tragedy of the commons (Barclay, 2004). This does not mean that reverse causality is not a problem anymore; in fact it is quite the opposite. Since there are more variables in place here that can cause the relationship, and I do not consider each case specifically to verify the direction of causality, reverse causality remains a significant problem. For example, people that exhibit more pro-environmental behaviours are more likely to meet people that are likeminded and want to change the climate. This will in turn enhance the social trust they have amongst themselves. Additionally, if more people take action to save the environment, other people might acknowledge them and will therefore place greater trust in the people around them to also take care of the environment.

Another issue is measurement validity concerning the variable of pro-environmental behaviour in dealing with the tragedy of the commons. Operationalizing variables, especially when working with an existing database, is difficult. For the variable of pro-environmental behaviour, it was decided to choose the item of 'intent to reduce energy use'. This item is well suited to the variable, but is still not a completely precise measure, as it does not specifically address the intent to deal with the tragedy of the commons. To rectify this issue, I have made an effort to stay as close to the previously theorised causal mechanism as possible, by adding 'sense of personal responsibility' as a mediator between social trust and the intent to reduce energy use.

Concerning reliability, attempts were made to maintain the highest level possible. Firstly, by using a data-base that is concerned with accurate measurements and levels of measurements. Secondly, by conceptualizing clearly, and keeping close to known and researched concepts, with the help of a commonly used and highly regarded measure for social trust which includes three different items. However, some issues still remain regarding reliability and in particular the issue of the moderating variables. Welfare regime theory is still an emerging theory and its measurement — especially when it comes to the Mediterranean and the post-socialist regimes — is still being debated. This has been addressed by applying cautiousness to the findings derived from this theory and reflecting on the insights and use of the theory.

Chapter 4: Findings and analysis

In this chapter, I present and analyse the findings of this research. First, I present insights about social trust, responsibility, pro-environmental behaviour, and the moderating variables through descriptive statistics. Following this, using inferential statistics, I test and analyse the relationships between the variables using various regression analyses. The results of the models will then be compared to the expectations of the hypotheses.

4.1   Descriptive statistics

In Figure 5, the means of the independent variable 'social trust' are ordered from highest to lowest. The colours represent the different categories of welfare regime. 'Social trust' has been calculated as the average of three items listed in Chapter 3 (Research Design and Measurements), measured on a scale of 0 to 10. The means are ordered from the lowest average, from Poland with an average of 4.28, to the highest, which is Norway with an average of 6.69.

Figure 5
Means of social trust per country organized by welfare regime
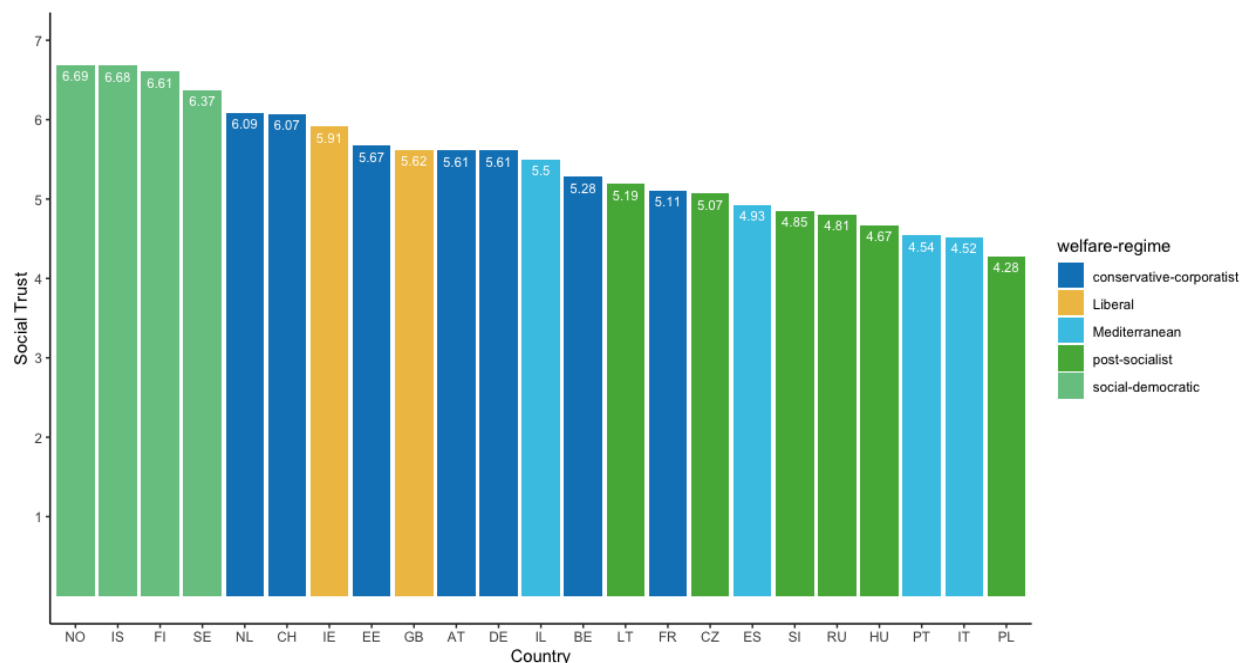
Although there is a substantial difference, social trust seems to be quite stable overall, without too many countries falling into the extremes. This supports the theory that social trust is quite stable and is caused by things other than the larger socio-political context (Rothstein, 2005). An additional explanation for the stability might be linked to using a measurement scale of 1 to 10, which Uslaner (2010) criticizes in his article '*Is Eleven Really a Lucky Number? Measuring Trust and the Problem of Clumping'.* His argument is that, in the past, social trust was measured with a dichotomous variable, which forced people to choose between two opposing sides. However, by measuring social trust with an 11-point scale, results tend to cluster around the middle. Uslaner's argument has some merit; however, it will later be demonstrated that the other variables measured in this thesis reveal much more variation per country, which strengthens the claim that social trust is relatively stable.

Nonetheless, as is shown in Figure 5, socio-political context appears to be linked to the minimal amount of instability that is observable. Countries with the same welfare regime seem to have similar levels of social trust. When categorising countries by welfare regime, it appears that the social-democratic countries are all grouped in the top and present only a slight difference in the average of social trust. The conservative-corporatist countries are a bit more divided around the middle, but their average is still quite close to each other. On one side, there are the Netherlands with an average of 6.09 and Switzerland with an average of 6.07, and on the other side, there are France with an average of 5.11 and Belgium with an average of 5.28. The liberal welfare states, which are represented by United Kingdom and Ireland, are also quite close in their social trust means. One of the unexpected results is that the liberal countries are in the middle of the means of the conservative-corporatist countries. This is surprising in as much as the theory of welfare regimes outlined in section 2.2 suggests that liberal countries will have a slight decrease in social trust over conservative-corporatist- countries.

In comparison to liberal countries, Mediterranean countries seem to present greater variety. In particular, the gap between Israel, with an average of 5.5, and Spain, the next country, with an average of 4.93. Referring back to the literature, however, provides some context for the gap. Gal (2010) refers to countries such as Cyprus and Israel as extended family of the Mediterranean welfare regime and not as part of the nuclear family. This is later tested with a statistical cluster analysis that shows that the Mediterranean welfare regimes do differ more than the three first welfare regimes (Minas, Jacobson, Antoniou, & McMullan, 2014). Finally, the post-socialist welfare regime, which is an addition to the existing welfare regime theory, aligns well with regards to the social trust variable. The means are clustered at the low end of social trust, with Poland having the lowest average of social trust at 4.28 and Lithuania having an average of 5.19.

The mediating variable of the sense of personal responsibility for climate change that is represented by the item 'Feeling for personal responsibility for climate change' is also a numeric variable: 0 to 10. When looking at Figure 6, we observe that although the distribution of the variable means is similar, the countries change positions in terms of highest to lowest means. This shows that there are most likely motives other than social trust that influence an individual's feeling of responsibility for climate change. This is, however, a very preliminary observation, and it will be further tested in a subsequent section. Social democratic countries are still grouped together, but are not leading the chart. Conservative-corporatist countries are much more divided. Estonia has one of the lowest averages with an average of 4.5. France, Switzerland and Germany on the other hand have the highest averages. Belgium, Austria and the Netherlands are in the middle. This could be an indication that welfare regimes are slightly less correlated with the feeling of responsibility for climate change, or alternatively that there are other elements that influence individuals in a specific country to have a feeling of responsibility for climate change.

Figure 6

Means of feeling of responsibility to reduce climate change per country from highest to lowest organized by welfare regime
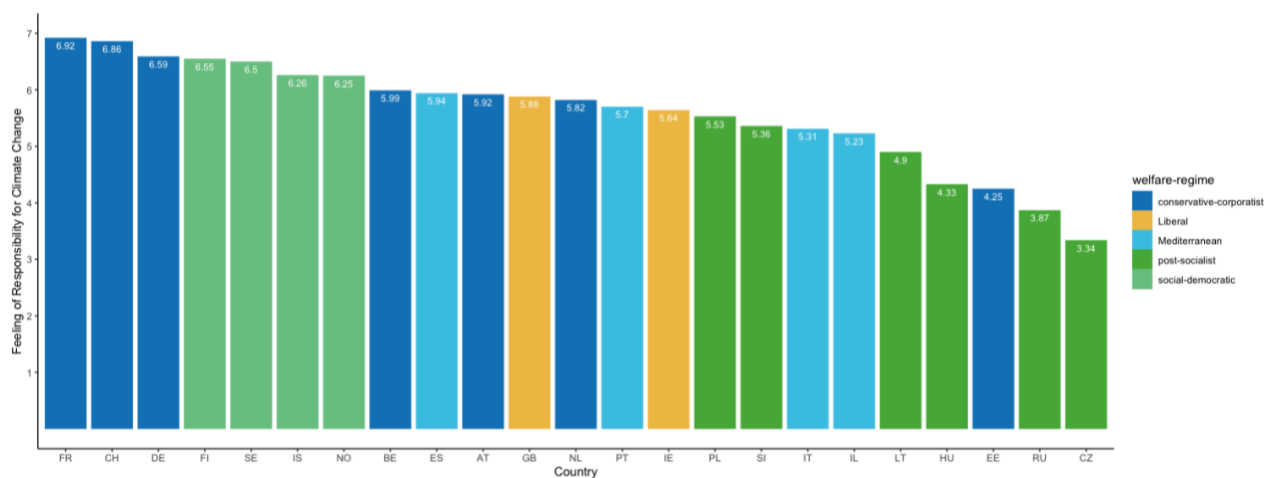
The averages of the liberal welfare regimes are quite close to each other. United Kingdom has an average of 5.88 and Ireland has an average of 5.54. The Mediterranean welfare regimes are relatively close to each other, with Spain having the highest average at 5.94 and Israel having the lowest average at 5.23. This is very different than the averages of social trust where Israel had the highest average out of all the Mediterranean countries. Post-socialist countries have overall lower averages, and more variation in their averages. The Czech Republic has the lowest average at 3.34 for the variable 'feeling of responsibility for climate change', followed by the Russian Federation with an average of 3.87. Lithuania (4.9) and Hungary (4.3) are in the middle, and leading are Poland, with an average of 5.53, and Slovenia, with an average of 5.36.

The next variable is the dependent variable of pro-environmental behaviour. Pro-environmental behaviour is a six-scale categorical variable. In Figure 7, the variable is categorized by country, and the percentage of people who chose each category is shown. The overall distribution is a standard distribution that leans more towards trying to reduce energy use. The value of 'never' is quite consistent: between 1% and 2.9%, except for Russia, where 7.3% of respondents indicated that they never do anything to reduce their energy use. This is followed by Israel at 11.1%.

Figure 7

Contingency Table- pro-environmental behaviour – reducing energy use
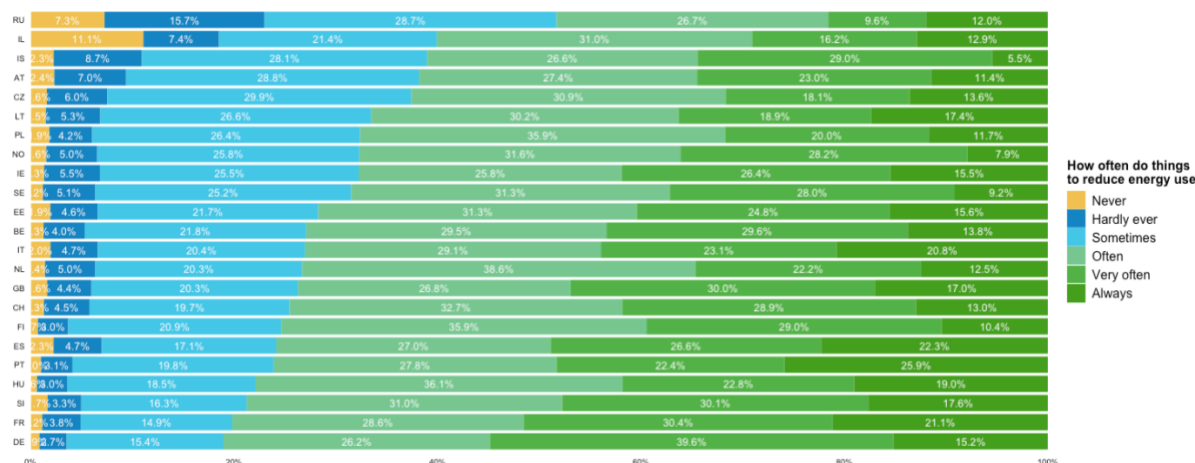
The value of 'Hardly ever' is between 3% and 6% in most countries. The exceptions here are Austria with 7%, Israel with 7.4%, Iceland with 8.7% and the Russian Federation with 15.7%. The value 'Sometimes' varies between 14.9% and 29.9%. On the lower end, there are France (14%), Germany (15.4%), and Slovenia (16.3%). On the higher end, there are the Czech Republic (29.9%), Austria (28.8%), the Russian Federation (28.7%), and Iceland (28.1%). For the value of 'Often' the percentages vary between 25.8% and 38.6%. On the lower end there are countries such as Ireland (25.8%), Iceland (26.6%), Germany (26.2%), the United Kingdom (26.8%) and the Russian Federation (26.7%). On the higher end, there are the Netherlands with 38.6%. The percentages of respondents that chose 'Very Often' vary between 9.6% and 39.6%. The countries that stand out are the Russian Federation, with the lowest percentage at 9.6%, Germany with 39.6%, followed by France with 30.4%. For the value 'Always', the percentages vary between 25.9% in Portugal to 5.5% in Iceland.

These percentages are difficult to grasp and obfuscate the interpreting of the results. In order to improve interpretations, this six-scale variable was transformed into a dichotomous variable. The first three values 'Never', 'Hardly ever' and 'Sometimes' are lumped together in a category of respondents who are considered not likely to reduce their energy use, or do so infrequently. The three last values 'Often', 'Very often' and 'Always' are gathered in a second category of respondents who are considered likely to take action to reduce energy use. Figure 8 is a visual representation with countries where participants are not likely to reduce energy use are led by the Russian Federation (51.7%), followed by Israel (39.9%), Iceland (39%), Austria (38.2%), and the Czech Republic (37.4%). Countries where the respondents are more likely to intend to reduce energy use are Germany (81%), France (80.2%), Slovenia (78.7%), and Hungary (77.9%).

Figure 8

Contingency Table dichotomous variable pro-environmental behaviour – reducing energy use
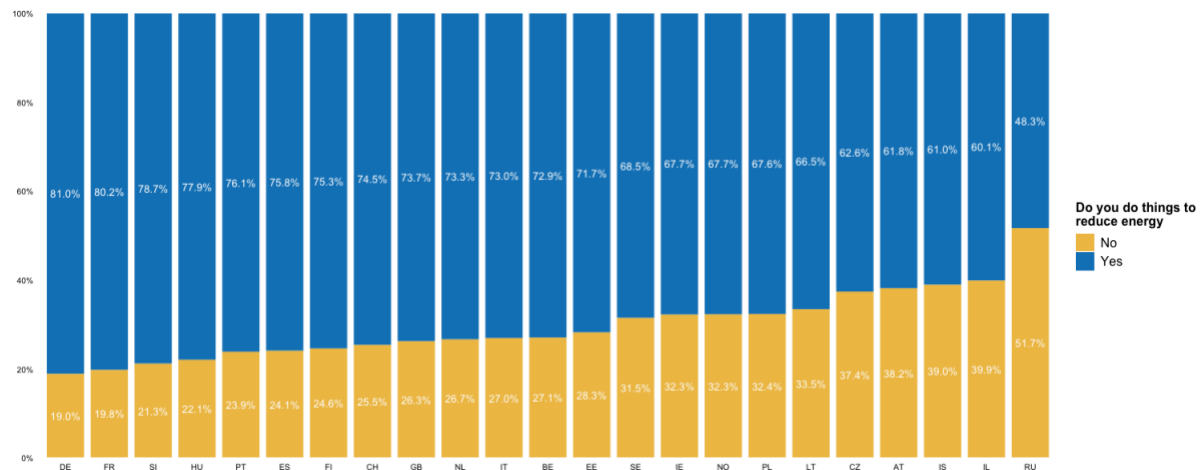
After having presented the independent, mediating and dependent variables separately, I will now explore the relationship between those variables. A Pearson correlation test was run on the relationship between the independent variable and the mediating variable. Results of the Pearson correlation indicated that there was a significant but very weak positive association between social trust and the feeling of responsibility regarding climate change, (r(41541) = .17, p<.001). With an r of .17, the association is very weak. This supports the very preliminary observation that was made while looking at the averages of social trust and the feeling of responsibility for climate change. Although this association is very weak, the large number of observations gives us more confidence in the results, and shows that, although it is very weak, it is not random, but rather it is significant and meaningful.

A point biserial correlation test was run on the relationship between the 'feeling of responsibility for climate change' (mediating variable) and the 'pro-environmental behaviour of intent to reduce energy use' (dependent variable). Results of the point biserial correlation indicated that there was a significant but very weak positive association between the feeling of responsibility for climate change and the pro-environmental behaviour of reducing energy use, (r(41528) = .18, p<.001). With an r of .18, the association is very weak. Again, however, the large number of observations gives us more confidence and shows that although it is very weak, it is not random, but significant and meaningful.

A point biserial correlation test was run on the relationship between 'social trust' (independent variable) and 'pro-environmental behaviour' (dependent variable). Results of the point biserial correlation indicated that there was a significant but extremely weak positive association between the feeling of responsibility for climate change and the pro-environmental behaviour, (r(43350) = .020, p<.001). With an r of .02, the association is extremely weak.

Having now addressed the independent, dependent and mediating variables, I will continue with the tested moderators. The first one, religiosity, is measured by a scale of 0 to 10. Figure 9 shows the averages by country divided into welfare regimes. As addressed before, this is a low-resolution method to measure religiosity, as religions and dominations vary and cannot be seen as strictly homogenous. However, for the purpose and scope of this study, it will suffice. The most religious countries are Poland (6.4) and Lithuania (5.69), followed by Italy, Portugal and Israel. At the bottom is the Czech Republic with an average of 2.3, followed by Sweden with 3.98. Of note here is how diverse the means of social-democratic and post-socialist countries are from another, and how close to each other the means of conservative-corporatist countries are.

Figure 9

Mean of religiosity per country from highest to lowest organized by welfare regime
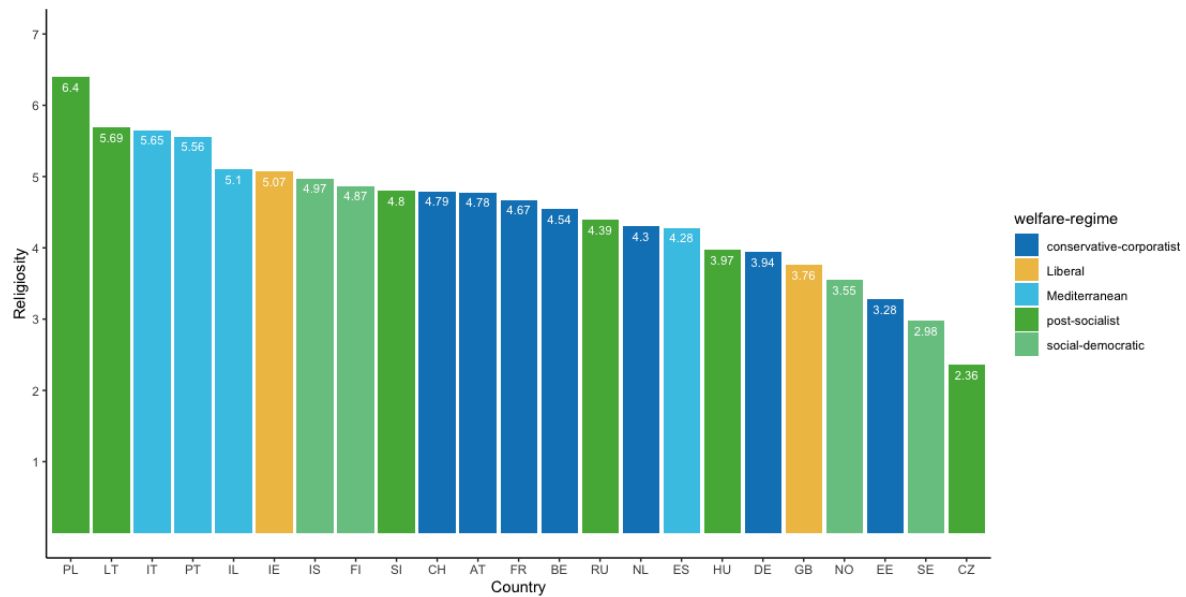
The next moderator, climate change as human caused or by natural processes, is presented in Table 2 in a cross tabulation. Although there are some differences, what is notable is that, overall, all countries have a similar pattern. Between 0.8% and 5.3% respondents believe that climate change is entirely caused by natural processes. Between 3.4% and 12.8% of respondents believe it is mainly caused by natural processes. Between 30.5% and 57.4% respondents believe it is equally caused by natural and human processes. Between 25.3% and 50% of people believe it is mainly caused by human activity. Between 2.1% and 12.5% of people in the countries surveyed believe it is entirely caused by human activity. Lastly, between 0% and 2.4% of people do not believe climate change is happening, with Russia as an outlier, where 6.4% of people believe climate change is not happening at all. Overall, what is shown here is that the dispersion of values falls into a normal distribution. There are some people who do not believe in climate change at all, the most significant of which is the Russian Federation with 6.4 percent of people not believing in climate change. In Iceland and Sweden there were no participants that believed there is no climate change. In general, most people believed that climate change is either equally caused by natural processes and human activity or that climate change is mainly caused by human activity.

Table 2

Cross tabulation in percentages – climate changed caused by natural processes or humans

Country	AT	BE	CH	CZ	DE	EE	ES	FI	FR	GB	HU	IE	IL	IS	IT	LT	NL	NO	PL	PT	RU	SE	SI
Entirely by natural processes	1.7	1.1	0.9	0.9	1	1.6	1.1	1.3	2.1	2.2	0.8	1.4	4.1	0.8	1.4	3.3	1.6	1.5	3.2	1.7	5.3	1.1	1.9
Mainly by natural processes	6.3	4.6	4.5	10.4	4.3	9.6	3.4	4.7	3.9	7.1	6.4	8.3	9.9	4.5	4.8	12.8	6.5	10.9	7.3	4.4	9.3	5.7	4.8
equally	30.5	39.6	49.6	50.3	41.3	53.6	35.8	42.2	46.8	54.2	45.8	52.0	40	40.6	36.8	47.8	48.5	49	57.4	44.3	45.1	41	54.1
Mainly by human activity	50	46.1	40.5	28.4	48.1	29.2	46.8	45.1	39.6	32.2	36.2	33.6	33.6	48	45.2	29.6	37.5	36.1	28.5	40.9	25.3	46.4	32.7
Entirely by human activity	10.5	8.2	4.1	7.9	5	5.2	12.5	6.6	7.3	3.9	10.2	4.5	10	6.1	11.5	4.7	5.62	2.1	3.2	8.6	8.6	5.8	6.4
climate change not happening	1	0.3	0.1	2.1	0.1	0.8	0.4	0.1	0.3	0.5	0.4	0.3	2.4	0	0.2	0.7	0.2	0.3	0.5	0.1	6.4	0	0.2

Education is another potential moderating variable, which has been measured by years in education. As seen in Figure 10, the average of years of education varies from an average of 14.95 at the highest end to an average of 10.1 at the lowest end. On average, high school completion is around 12 years; the more noteworthy averages are below 12 or the furthest above 12. Portugal has a compulsory education system of 12 years; however, it has a low average of 10.1 years, meaning the dropout rate is high. Portugal is followed by Switzerland (11.3), which has compulsory education for 9-11 years, meaning that most people probably complete high school. Switzerland is followed by Italy (11.3), and Hungary (11.55). On the other side of the spectrum are Iceland with an average of 14.95 years of education, followed by Ireland (24.58), Germany (14.26), and Norway (14.07).

Figure 10

Mean number of years of education per country from highest to lowest organized by welfare regime
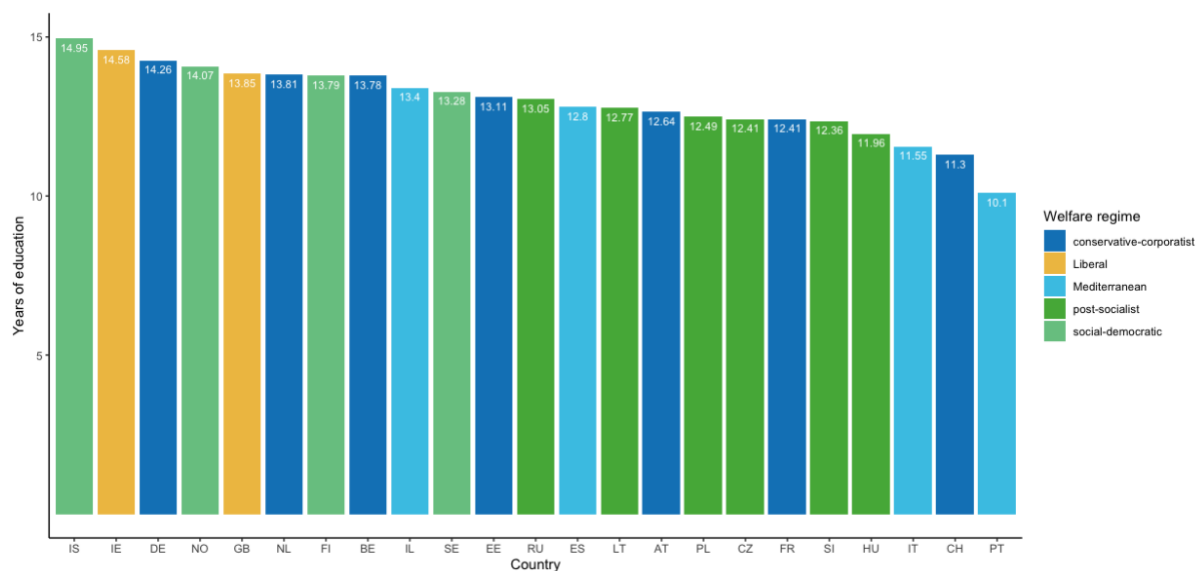
These are all the descriptive statistics of the variables that are used to test the hypotheses. In the next section, the hypotheses will be tested using inferential statistics.

4.2 INFERENTIAL STATISTICS

In this section, I use inferential statistics to test the hypotheses. Inferential statistics are used to make inferences from a sample onto a larger population. As I am testing hypotheses with a large number of observations, even small significant relationships can yield results. Table 3 shows the hypotheses that were derived from the literature review.

Table 3

Hypotheses

H0	Social trust positively impacts pro-environmental behaviour
H1	Sense of responsibility for climate change mediates the positive impact of social trust on pro-environmental behaviour.
H2	Higher levels of religiosity positively moderate the impact of social trust on sense of personal responsibility for climate change.
H3	The belief that climate change is caused by humans positively moderates the positive impact of social trust on sense of personal responsibility for climate change.
H4	Higher levels of education positively moderate the impact of social trust on the sense of personal responsibility for climate change.
H5	Higher levels of welfare positively moderate the impact of sense of personal responsibility for climate change on pro-environmental behaviour.

Hypothesis 0: Social trust positively impacts pro-environmental behaviour
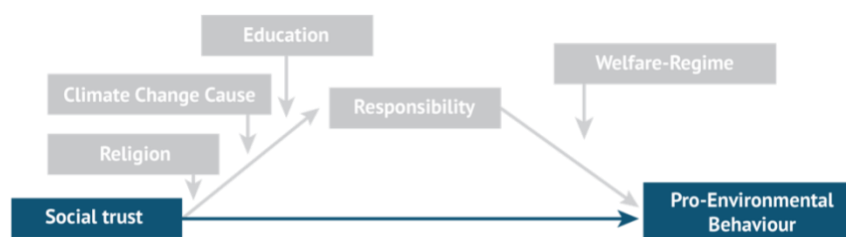
In this section, the relationship between social trust and the intent to engage in pro-environmental behaviour is tested. In the regression without control variables, the relationship is not significant (p= .0637) when judging by the 0.05 benchmark that was set. However, it is close enough to the benchmark not to be completely random. This means that we can still consider it to be meaningful; being mindful, however, that there still is a possibility that it is partially random. The second regression adds the following control variables: household income, gender, and age. It completely loses the significance (p=0.359) of the impact of the independent variable 'social trust'.

Table 4

Regression – Social trust impact on individual intent to reduce energy use without controls and with controls

	Dependent variable:	
	Intent to reduce energy use	
	(1)	(2)
Social Trust	0.006 (0.003)	0.003 (0.003)
HH Income		-0.002 (0.002)
Gender		0.132*** (0.013)
Age		0.009*** (0.0004)
Constant	4.121*** (0.018)	3.517*** (0.035)
Observations	43,352	35,741
R^2	0.0001	0.022
Adjusted R^2	0.0001	0.022
Residual Std. Error	1.212 (df = 43350)	1.187 (df = 35736)
F Statistic	3.438 (df = 1; 43350)	203.088*** (df = 4; 35736)

Note: *p<0.05; **p<0.01; ***p<0.001

This is not what was expected according to the theory, but before I address this discrepancy, I will simplify the interpretation by transforming the six-scale variable for 'intent to reduce energy use' into a dichotomous variable. The first three values, 'Never', 'Hardly ever' and 'Sometimes', are put together in a category of participants that are not likely to reduce their energy use or do so infrequently. The three last values of 'Often', 'Very often' and 'Always' are put in a second category of participants who are likely to take action to reduce energy use. In Table 5, the same regressions are completed, but with the new dichotomous variable. What can be seen is that the significance increases in the first regression without the controls (p<.001) with a positive slope of 0.005. The second regression includes all the control variables and is found (p=0.00109) to lessen the slope to 0.004. This is what theory suggested; however, the impact is smaller than expected.

Table 5

Regression – Social trust impact on the dichotomous variable of intent to reduce energy use without controls and with controls

	Dependent variable:	
	Intent to reduce energy use	
	(1)	(2)
Social Trust	0.005^{***} (0.001)	0.004^{**} (0.001)
HH Income		0.003^{**} (0.001)
Gender		0.037^{***} (0.005)
Age		0.003^{***} (0.0001)
Constant	1.674^{***} (0.007)	1.473^{***} (0.013)
Observations	43,352	35,741
R^2	0.0004	0.015
Adjusted R^2	0.0004	0.015
Residual Std. Error	0.458 (df = 43350)	0.450 (df = 35736)
F Statistic	18.547^{***} (df = 1; 43350)	136.550^{***} (df = 4; 35736)

Note: $^{*}p<0.05;$ $^{**}p<0.01;$ $^{***}p<0.001$

In order to investigate these results more in depth, the effect of social trust on the intent to reduce energy use is analysed at the country level. In Table 6, these country level regressions are displayed. In most of the countries, the relationship of social trust is not significant. Some countries have a positive effect of social trust on reducing energy use, such as Switzerland (p=0.0015), Estonia (p=0.007), Spain (p<0.001), Hungary (p<0.001), Slovenia (p=0.039), and Poland (p=0.005). Some countries have a negative effect of social trust on reducing energy use, such as the Czech Republic (p<0.001) and Austria (p=0.034).

Table 6

Regression – country level Impact of social trust on intent to reduce energy use (c)

	AT	BE	CH	CZ	DE	EE	ES	FI	FR	GB	HU	IE	IL	IS	IT	LT	NL	NO	PL	PT	RU	SE	SI
Social Trust	-0.03^{*}	0.02	0.06^{**}	-0.06^{***}	0.01	0.04^{**}	0.07^{***}	0.02	-0.003	0.02	0.07^{***}	0.01	-0.02	-0.003	-0.01	0.01	0.03	0.01	0.04^{**}	-0.02	0.03^{*}	0.04^{*}	-0.001
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	4.13^{***}	4.11^{***}	3.87^{***}	4.29^{***}	4.39^{***}	3.95^{***}	4.06^{***}	4.11^{***}	4.48^{***}	4.20^{***}	4.02^{***}	4.12^{***}	3.86^{***}	3.90^{***}	4.32^{***}	4.08^{***}	3.96^{***}	3.97^{***}	3.85^{***}	4.55^{***}	3.37^{***}	3.84^{***}	4.38^{***}
	(0.08)	(0.09)	(0.11)	(0.07)	(0.07)	(0.09)	(0.09)	(0.11)	(0.08)	(0.09)	(0.08)	(0.08)	(0.10)	(0.17)	(0.06)	(0.08)	(0.12)	(0.13)	(0.07)	(0.09)	(0.08)	(0.12)	(0.09)
Observations	1,994	1,764	1,514	2,222	2,824	1,996	1,901	1,906	2,064	1,941	1,552	2,739	2,428	867	2,512	1,998	1,675	1,535	1,611	1,247	2,244	1,529	1,289
R^2	0.002	0.001	0.01	0.01	0.0005	0.004	0.01	0.001	0.0000	0.001	0.01	0.0001	0.001	0.0000	0.0001	0.0001	0.001	0.0001	0.005	0.001	0.002	0.003	0.0000
Adjusted R^2	0.002	0.001	0.01	0.01	0.0001	0.003	0.01	-0.0000	-0.0005	0.0002	0.01	-0.0002	0.0003	-0.001	-0.0003	-0.0004	0.001	-0.001	0.004	0.0003	0.002	0.002	-0.001

Note: $^{*}p<0.05;$ $^{**}p<0.01;$ $^{***}p<0.001$

Although there is evidence to support the positive impact of social trust on the intent to reduce energy use, the evidence is not consistent. When adding the controls to the regression with the original six-scale variable, the impact becomes statistically insignificant. Only when simplifying the variable does it become statistically significant even with controls; nevertheless, there is an impact. Although this result was predicted by the literature, the size of the impact is less than in other studies (Bouman, et al., 2020; Dasi, Miarsyah, & Rusdi, 2019; Punzo, Panarello, Pagliuca, Castellano, & Aprile, 2019; Gür, 2020).

The measurement of the dependent variable is probably an explanation for the discrepancies between different studies. According to Rajecki (1982, p. 242), discrepancies in outcomes of pro-environmental behaviours in different research are common. This is frequently the result of flaws in research methodology, such as the operationalization of pro-environmental behaviours. In this thesis, the dependent variable that is tested is measured by just one item: "There are some things that can be done to reduce energy use such as... In your daily life, how often do you do things to reduce your energy use?" This item is appropriate because it addresses a specific action that can be taken to deal with climate change, unlike in many earlier studies, which used a more general item to measure intended pro-environmental behaviour, such as 'care for the environment' (ollmuss & Agyeman, 2002). The downside of using such this item is that it does not specify that the action is specifically related to the environment. This could potentially lead respondents with different motivations, such as saving money, to reduce their energy use, irrespective of its impact on the environment. Therefore, the relationship between social trust and the intent to reduce energy use could potentially appear to be weaker, or even insignificant, compared to what it actually is.

It is still worth investigating more closely why the relationship between social trust and the intent to reduce energy use is negative at times. Such is the case in the Czech Republic and Austria. One tentative explanation is that social trust can have an opposite effect to what is expected. According to the literature the expectation is that when an individual has more social trust, they will trust that others will also do their best to fight climate change, despite the cost. Therefore, despite the high upfront costs of some pro-environmental behaviours, individuals with high levels of social trust will still exhibit these behaviours. However, when one does not feel a personal responsibility, the sense of social trust might have the opposite effect. If an individual trusts that others will act to deal with climate change, they might feel that their actions are offset, and can therefore use more energy. This shows that, although social trust can directly impact the intent to reduce energy use positively, in some cases the opposite might be true.

Hypothesis 1: The feeling of responsibility for climate change mediates the positive impact of social trust on pro-environmental behaviour.
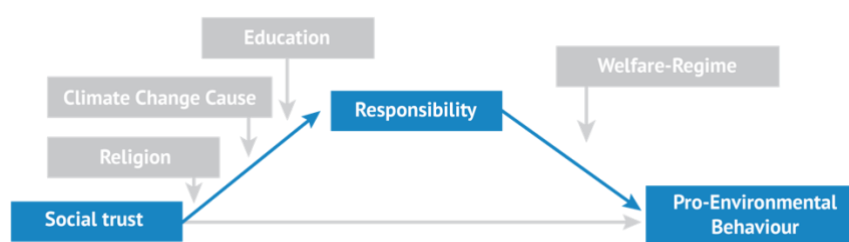
In order to test the hypothesis, a mediation analysis (Table 7) was conducted with no control variables, with 41162 observations, with a bootstrap of 5000, and ended after 16 iterations. It has a fit according to the Comparative Fit Index and Tucker Lewis Index. There is a statistically significant (p<.001) negative (-.016) direct effect (a). This means that there is a negative impact of the independent variable 'social trust' on the dependent variable of 'intended pro-environmental behaviour'. As theorized, the relationship of the independent variable of social trust and intended pro-environmental behaviour is significantly (p<.001) and positively (0.023) mediated by feeling of responsibility for climate change. This means that the indirect effect (ab) is significant and positive. The total effect (c + ab) of the model of mediation is also highly significant (p=.006) with a positive effect of 0.006.

The second regression analysis in Table 7 includes the controls of household income, gender and age. It included 34,124 observations and had a fit according to the Comparative Fit Index and Tucker Lewis Index. The indirect effect (ab) is significant (p<.001) and positive (.019). The direct effect (a) is less significant (p=.012), but is negative (-.003). The total effect becomes even more significant (p=0.002). This means that there is still a significant partial mediation with controls, but the effect slightly decreases.

Table 7

Lavaan mediation regression – without controls and with controls

	Estimate	Z-value	P- value	Estimate	Z-value	P-value
				Ended normally after 16 iterations		
		(1)			(2) With controls	
Social Trust on reducing energy use (c)	-0.016	-4.791	0.000***	-0.003	-2.507	0.012*
Social trust on Responsibility (a)	0.246	31.511	0.000***	0.202	27.355	0.000***
Household Income				0.087	18.726	0.000***
Gender				0.180	6.612	0.000***
Age				-0.008	-10.693	0.000***
Responsibility on reducing energy use (b)	0.092	39.189	0.000***	0.096	35.721	0.000***
Household Income				-0.016	-1.291	0.197
Gender				0.108	6.359	0.000***
Age				0.010	22.259	0.000***
Variances						
Reducing energy use	1.364	154.961	0.000***	1.303	182.127	0.000***
Responsibility	7.160	165.048	0.000***	6.938	142.530	0.000***
Defined Parameters						
Mediation (ab)	0.023	24.307	0.000***	0.019	21.836	0.000***
Total (c + ab)	0.006	1.878	0.006**	0.004	3.091	0.002**
Observations	41,162			34,124		
Comparative Fit Index (CFI)	1.000			1.000		
Tucker-Lewis Index (TLI)	1.000			1.000		
R^2 Outcome reduce energy use	0.042			0.050		
R^2 Outcome responsibility	0.028			0.047		
Bootstrap draws	5000			5000		
Number free parameters	5			11		

Note: *p<0.05; **p<0.01; ***p<0.001

In order to understand the relationships in the mediation better, country level regressions are run on the individual relationships. Table 8 shows the basic regression of social trust on feeling of responsibility for climate change (a) on country level.

Table 8

Regression – Social trust impact on the sense of personal responsibility for climate change on country level without controls

	AT	BE	CH	CZ	DE	EE	ES	FI	FR	GB	HU	IE	IL	IS	IT	LT	NL	NO	PL	PT	RU	SE	SI
							Dependent variable:																
							Sense of personal responsibility for climate change																
Social Trust	0.24***	0.17***	0.25***	0.10**	0.23***	0.23***	0.24***	0.27***	0.15***	0.18***	0.19***	0.21***	-0.08	0.16**	0.21***	0.14***	0.27***	0.13**	0.13***	0.27***	0.30***	0.19***	0.14***
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.05)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)	(0.03)	(0.04)	(0.04)
Constant	4.59***	5.08***	5.37***	2.83***	5.29***	2.94***	4.74***	4.78***	6.18***	4.85***	3.45***	4.37***	5.68***	5.24***	4.35***	4.18***	4.18***	5.36***	4.96***	4.46***	2.41***	5.27***	4.68***
	(0.19)	(0.19)	(0.23)	(0.17)	(0.15)	(0.23)	(0.19)	(0.23)	(0.17)	(0.20)	(0.18)	(0.17)	(0.24)	(0.37)	(0.13)	(0.18)	(0.25)	(0.28)	(0.17)	(0.24)	(0.16)	(0.24)	(0.21)
Observations	1,908	1,747	1,481	2,116	2,784	1,936	1,812	1,885	2,026	1,898	1,534	2,682	2,115	857	2,449	1,750	1,649	1,516	1,494	1,217	1,913	1,510	1,264
R^2	0.03	0.01	0.03	0.01	0.03	0.02	0.02	0.03	0.01	0.02	0.02	0.02	0.002	0.01	0.03	0.01	0.03	0.01	0.01	0.02	0.05	0.02	0.01
Adjusted R^2	0.03	0.01	0.03	0.005	0.03	0.02	0.02	0.03	0.01	0.01	0.02	0.02	0.001	0.01	0.03	0.01	0.03	0.01	0.01	0.02	0.05	0.02	0.01

Note: *p<0.05; **p<0.01; ***p<0.001

The relationship between social trust and the feeling of responsibility for climate change appears to be very significant in all countries except Israel (p=0.58). The average level of social trust in Israel is 5.5, which is the highest amongst the Mediterranean regime countries in this study. Despite this, however, when measuring 'feeling responsible for climate change' in Israel the average is only 5.23, which is the lowest of the Mediterranean welfare regime countries. Regarding reducing energy use, 39.9 percent of Israelis indicate that they do not try to reduce energy use at all; this the highest percentage after Russia. Therefore, although social trust is high in Israel, feeling of responsibility for climate change and the intention to act to combat it is lower than in most countries.

There are two tentative explanations for this; the first is related to the measurement of social trust. Israel is in a unique situation compared with the other countries in this study; Since its establishment as a nation-state, Israel has been in a near constate state of conflict with its neighbours, as well as with certain groups within its (contentious) borders. Research has shown that the boundaries of in-group and out-group change in conflict areas (Shamoa-Nir, Razpurker-Apfeld, Dautel, & Taylor, 2020). For example, one of the three items that make up social trust is: "would you say that most people can be trusted, or that you can't be too careful in dealing with people?" the answer could still refer to the ingroup instead of including the outgroup that includes Palestinians or other groups. This tentative explanation is supported by the study '*How general is trust in "most people"? solving the radius of trust problem'*. In the study they find that social trust is a valid measure of general trust in others, however, the radius of what participants understand with "most people" varies considerably across countries (Delhey, Newton, & Welzel, 2011, p. 800).

The second tentative explanation is that the political and social priorities are more focused on short term issues of security rather than the delayed future consequence of climate change. "The Middle East is amongst the least stable and fragile regions" (Feitelson, Tamimi, & Rosenthal, 2012, p. 241). According to Manson (2013), although Palestinian and Israeli political authorities acknowledge climate change as a risk, they don't treat is as a security risk or as important emergency to act upon. The responsibility to deal with the climate change falls on environment policy makers rather than the responsibility of the individual (Manson, 2013).

The rest of the countries are all significant. In Norway (0.13) and Portugal (0.13) the impact is still statistically significant but has less of a positive impact. Comparatively, countries with bigger slopes, such as Russia (0.30), the Netherland (0.27), Finland (0.27) and Portugal (0.27), are countries which have a larger positive impact of social trust on the intent to reduce energy use. The Czech Republic has a (p=0.001) significant impact (0.25) with a low R squared of 0.005. The R squared of all other countries

show that the model explains between 1% to 3% of the variation. This means that there are other variables that influence the dependent variable.

Next, the relationship between the mediator and dependent variable will be explored (b). The relationship appears to stay significant across all countries as can be seen in Table 9. All countries except Portugal (p=.004) and Hungary (p=.0027) had a p-value that is less than 0.001. This means that all the relationships appear to be significant, but do vary in the amount of impact. The highest impact can be found in Sweden (0.16) Switzerland (0.15) and Austria (0.15). The lowest impact can be found in Portugal (0.03), Israel (0.04) Hungary (0.03) and Czech Republic (0.04). The countries that have a high impact also have higher R squared. In Austria, the model explains 12% of the variation, in Switzerland 9%, and in Sweden 10%.

Table 9
*Regression – Impact of feeling of responsibility for climate change on intent to reduce energy use (b) on country level.*

	Dependent variable:																						
	Intent to reduce energy use																						
	AT	BE	CH	CZ	DE	EE	ES	FI	FR	GB	HU	IE	IL	IS	IT	LT	NL	NO	PL	PT	RU	SE	SI
Responsibility	0.15***	0.12***	0.15***	0.04***	0.13***	0.05***	0.10***	0.10***	0.10***	0.13***	0.03**	0.09***	0.04***	0.09***	0.06***	0.08***	0.12***	0.12***	0.07***	0.03**	0.06***	0.16***	0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	3.09***	3.54***	3.18***	3.85***	3.60***	3.99***	3.78***	3.56***	3.79***	3.55***	4.20***	3.66***	3.62***	3.30***	3.99***	3.73***	3.46***	3.26***	3.60***	4.26***	3.35***	3.06***	3.89***
	(0.06)	(0.07)	(0.09)	(0.04)	(0.06)	(0.05)	(0.07)	(0.07)	(0.08)	(0.07)	(0.06)	(0.05)	(0.06)	(0.11)	(0.06)	(0.06)	(0.07)	(0.08)	(0.07)	(0.07)	(0.06)	(0.08)	(0.07)
Observations	1,906	1,745	1,482	2,104	2,777	1,933	1,828	1,887	2,027	1,897	1,506	2,691	2,138	865	2,428	1,751	1,648	1,517	1,526	1,217	1,867	1,515	1,275
R²	0.12	0.06	0.09	0.01	0.08	0.01	0.05	0.05	0.04	0.07	0.01	0.04	0.01	0.04	0.01	0.03	0.06	0.07	0.03	0.01	0.01	0.10	0.05
Adjusted R²	0.12	0.06	0.09	0.01	0.08	0.01	0.05	0.05	0.04	0.07	0.01	0.04	0.01	0.04	0.01	0.03	0.06	0.07	0.03	0.01	0.01	0.10	0.05

Note: $^*p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$

In this section, I tested the first hypothesis and found that there is a significant partial mediation and total effect. The results are robust despite using a set of control variables. The separate relationships in the mediation (a and b) were tested at country level and were found to be significant across the different countries.

Hypothesis 2: A higher level of religiosity positively moderates the impact of social trust on feeling of personal responsibility for climate change.
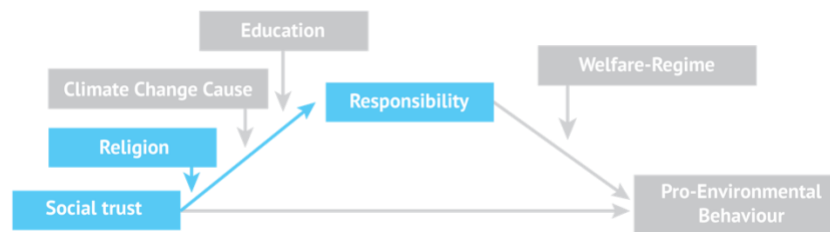
To test this hypothesis, a regression was done on all the participants of the 23 countries in Table 10. In the first regression (n=41,247), without control variables, the interaction is statistically significant (p<0.001). In the second regression (n=34,238), the interaction stays very significant (p<.001), even after adding the control variables of household income, gender and age. The addition of religiosity adds to the R squared of the model, explaining 5.6% of the variation.

Table 10

Regression – Moderation of religiosity on the relationship between s-ocial trust and feeling of personal responsibility for climate change.

	Dependent variable:	
	Sense of personal responsibility for climate change	
	(1)	(2)
Social Trust	0.298*** (0.012)	0.287*** (0.014)
Religiosity	0.117*** (0.013)	0.136*** (0.014)
HH Income		0.110*** (0.005)
Gender		0.114*** (0.029)
Age		-0.011*** (0.001)
Interaction	-0.011*** (0.002)	-0.011*** (0.002)
Constant	3.709*** (0.071)	3.539*** (0.101)
Observations	41,247	34,238
R^2	0.033	0.056
Adjusted R^2	0.033	0.056
Residual Std. Error	2.671 (df = 41243)	2.638 (df = 34231)
F Statistic	473.463*** (df = 3; 41243)	339.023*** (df = 6; 34231)

Note: $^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$

The effect of religiosity on the relationship between social trust and sense of personal responsibility for climate change can be best illustrated by the interaction plot in Figure 11. This figure shows that with high social trust religiosity is not very influential. However, with low social trust, higher levels of religiosity are linked to more feeling of personal responsibility for climate change. Furthermore, lower levels of religiosity are linked to less feeling of personal responsibility for climate change. Although the interaction changes depending on the country, in the statistically significant countries this pattern is always present to some degree.

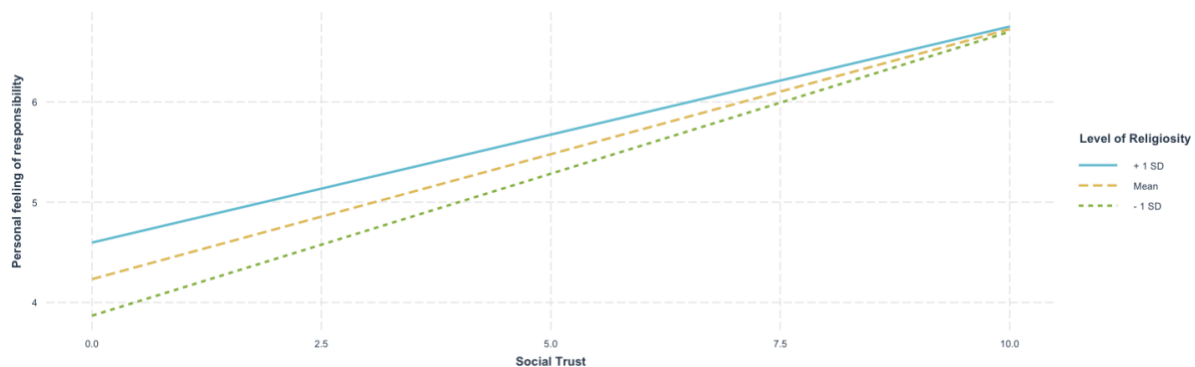**Figure 11**
Interaction plot religiosity

Table 11 includes a regression model that is run on country level. This is done in order to see if there is a difference between countries in the effect of the moderator of religiosity on the relationship between social trust and on feeling of personal responsibility for climate change. This is indeed the case, as the interaction is only significant in a few countries. Highly significant in Finland (p=0.001), Russia (p= 0.0015) and Germany (p<0.001), lower but still significant in Belgium (p=0.01), the Czech Republic (p=0.02), Ireland (p=0.03), Norway (p=0.02) and Iceland (p=0.048).

Table 11

Regression – Social trust impact on sense of personal responsibility for climate change on country level without controls

|	AT	BE	CH	CZ	DE	EE	ES	FI	FR	GB	HU	IE	IL	IS	IT	LT	NL	NO	PL	PT	RU	SE	SI
									Dependent variable:														
									Feeling responsibility for climate change														
Social Trust	0.24***	0.29***	0.33***	0.03	0.35***	0.27***	0.28***	0.42***	0.13*	0.22***	0.18**	0.32***	0.01	0.32**	0.19***	0.15*	0.23***	0.23***	0.14	0.24*	0.42***	0.21***	0.11
	(0.06)	(0.06)	(0.07)	(0.04)	(0.04)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.06)	(0.05)	(0.08)	(0.10)	(0.05)	(0.07)	(0.07)	(0.06)	(0.10)	(0.10)	(0.05)	(0.05)	(0.08)
Religion	0.01	0.15**	0.11	0.04	0.29***	0.14	0.05	0.27***	-0.04	0.09	0.05	0.12*	0.08	0.27**	-0.02	0.12	0.01	0.28**	-0.01	-0.11	0.29***	0.07	0.04
	(0.06)	(0.06)	(0.07)	(0.06)	(0.05)	(0.08)	(0.06)	(0.07)	(0.05)	(0.06)	(0.06)	(0.05)	(0.07)	(0.11)	(0.04)	(0.06)	(0.08)	(0.10)	(0.06)	(0.08)	(0.05)	(0.08)	(0.07)
Interaction	-0.001	-0.03*	-0.02	0.02*	-0.03***	-0.01	-0.01	-0.04**	0.004	-0.01	0.0002	-0.02*	-0.02	-0.03*	0.004	-0.003	0.01	-0.03*	-0.0005	0.005	-0.03**	-0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Constant	4.56***	4.40***	4.83***	2.81***	4.28***	2.46***	4.55***	3.59***	6.36***	4.59***	3.29***	3.73***	5.28***	3.86***	4.47***	3.55***	4.16***	4.46***	5.00***	5.11***	1.31***	5.06***	4.53***
	(0.35)	(0.32)	(0.42)	(0.22)	(0.23)	(0.34)	(0.30)	(0.40)	(0.28)	(0.31)	(0.28)	(0.32)	(0.44)	(0.67)	(0.26)	(0.38)	(0.42)	(0.43)	(0.45)	(0.52)	(0.27)	(0.33)	(0.40)
Observations	1,890	1,747	1,471	2,086	2,779	1,932	1,803	1,883	2,020	1,890	1,520	2,677	2,093	853	2,412	1,714	1,645	1,514	1,464	1,215	1,877	1,507	1,255
R^2	0.03	0.02	0.03	0.04	0.05	0.03	0.02	0.04	0.01	0.02	0.02	0.02	0.003	0.02	0.03	0.02	0.03	0.02	0.01	0.03	0.07	0.02	0.01
Adjusted R^2	0.03	0.02	0.03	0.04	0.05	0.02	0.02	0.04	0.01	0.01	0.02	0.02	0.002	0.02	0.03	0.02	0.03	0.01	0.01	0.03	0.07	0.02	0.01

Note: $^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$

The pattern of the mediation was different in countries that were found to be statistically significant. The interaction plots for these mediation patterns can be found in Appendix A.

Although religiosity is a significant moderator in several countries, the moderation effect does change slightly from country to country. There have been several studies on religion in relation to feeling of responsibility for the climate, which found that there is a geographical bias (Nche, 2020, p. 81). In different countries religion interacts differently with sense of responsibility to combat climate change. Overall, however, higher levels of religiosity are linked to a more stable and higher sense of personal responsibility for climate change.

A tentative explanation to understand why personal sense of responsibility is more stable for religious individuals, regardless of levels of social trust, has to do with the nature of belief in the Abrahamic religions. The Abrahamic religions (Christianity, Judaism and Islam) are the most common religions in the countries studied in this thesis. The Abrahamic religions have shared foundations, however, each religion manifests differently. In general, though, they share basically similar beliefs about the environment and human beings' responsibility to combat climate change. These beliefs can be divided into three main categories. The first is that human beings' have a responsibility to nurture and protect the earth, as this shows respect for God's creation. In the Abrahamic traditions, humans are seen to be part of God's creation, while also being in the role of caretaker for His creation (Bomberg & Hague, 2018, p. 587). The second shared belief is a belief that one has a personal duty to comply with a set of moral codes. This is underlined by every individual being accountable to God for his actions and intentions (Bomberg & Hague, 2018, p. 587). What this entails is that each individual has a personal duty not to be selfish or let greed guide one's behaviour towards the environment (Schaefer, 2016). The third is a belief in the responsibility of the individual to care for their neighbour and the community at large (Bomberg & Hague, 2018, p. 588). All three religions have officially expressed concern that climate change will most adversely affect poor and marginalized communities, and that those individuals and communities in more privileged circumstances have an increased duty therefore to combat climate change (Schaefer, 2016). The combination of these three shared beliefs helps greatly in understanding why religion is a moderator in the relationship between social trust and the personal feeling of responsibility; Religious people who faithfully follow the moral duties inscribed in their faith must naturally assume a responsibility for combatting climate change, regardless of their levels of social trust.

Hypothesis 3: The belief that climate change is caused by humans positively moderates the positive impact of social trust on feeling of personal responsibility for climate change.
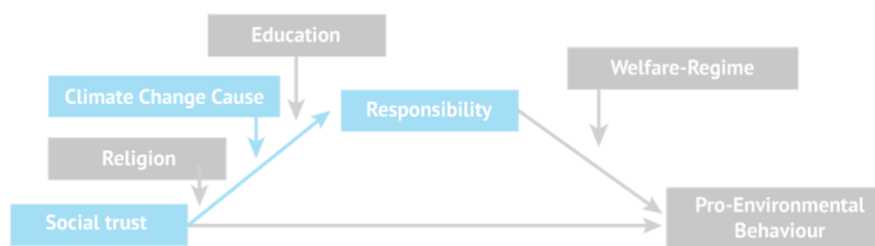
The regression seen in Table 12 was performed on all of the participants from every country in the study. The first one was performed without the control variables (n=40,818). It shows that social trust has a significant positive relationship with personal feeling of responsibility for climate change, especially when participants believed it was caused by human activity. None of the interactions are significant (p>0.05), meaning it is very possible that the results could be random. Adding the control variables, the effect of interaction becomes even smaller and stays statistically insignificant. This means that whether someone believes climate change is caused by human activity or by natural processes is not a moderator overall.

Table 12

Regression – Moderation of causes of climate change on the relationship between social trust and -feeling of personal responsibility for climate change

|	Dependent variable:	
	Sense of personal responsibility for climate change	
	(1)	(2)
Social Trust	0.189*** (0.044)	0.211*** (0.049)
Mainly natural causes	0.627* (0.289)	0.700* (0.320)
Equally	2.103*** (0.253)	2.168*** (0.282)
Mainly Human activity	2.615*** (0.255)	2.662*** (0.284)
Entirely Human activity	2.635*** (0.277)	2.807*** (0.309)
HH Income		0.079*** (0.005)
Gender		0.156*** (0.028)
Age		-0.005*** (0.001)
Interaction: Mainly Natural processes	0.052 (0.051)	0.023 (0.056)
Interaction: Equally	0.025 (0.045)	0.002 (0.050)
Interaction: Mainly human activity	0.078 (0.046)	0.050 (0.050)
Interaction: Entirely human activity	0.097 (0.050)	0.062 (0.055)
Constant	2.121*** (0.246)	1.730*** (0.282)
Observations	40,828	33,890
R^2	0.092	0.107
Adjusted R^2	0.092	0.106
Residual Std. Error	2.563 (df = 40818)	2.543 (df = 33877)
F Statistic	460.398*** (df = 9; 40818)	337.387*** (df = 12; 33877)
Note:	*p<0.05; **p<0.01; ***p<0.001	

An interaction plot has been made to visualize the interaction between the variables (Figure 12). This interaction was found to be statistically insignificant, indicating that the slopes seen in the figure have a high probability of being random. Although it appears that, overall, an individual's belief about the

cause of climate change is not a moderator, it is possible that in different countries, when analysed individually, it will end up acting like a moderator in some of them.

Figure 12

Interaction plot causes of climate change – human activity vs. natural processes
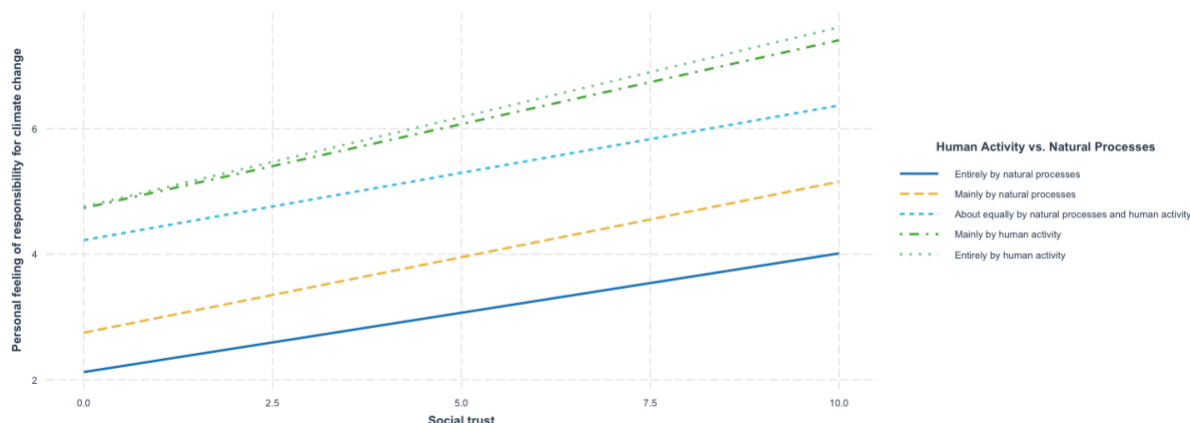
For that reason, a regression was done for every country. In the regression Table 13, one can see that some countries do in fact have significant interactions, while others do not. The countries that have a significant interaction are Belgium, Switzerland, Finland, Ireland, Lithuania and Slovenia.

Table 13

Regression – Causes climate change interactions on country level without controls

|	Dependent variable: Feeling responsibility for climate change																						
	AT	BE	CH	CZ	DE	EE	ES	FI	FR	GB	HU	IE	IL	IS	IT	LT	NL	NO	PL	PT	RU	SE	SI
Social Trust	0.37*	-0.76***	-0.48*	0.09	0.32	0.06	-0.04	-0.34	-0.15	0.12	-0.16	0.75***	0.17	-0.36	0.30	0.58***	0.17	-0.06	0.37	0.04	0.22	-0.03	-0.51
	(0.19)	(0.23)	(0.23)	(0.28)	(0.26)	(0.21)	(0.34)	(0.25)	(0.19)	(0.21)	(0.33)	(0.22)	(0.18)	(0.44)	(0.18)	(0.13)	(0.33)	(0.37)	(0.21)	(0.33)	(0.12)	(0.23)	(0.29)
Mainly natural causes	1.78	-2.05	-3.19	1.13	3.19	1.69	-0.55	-3.69	-1.03	0.50	-0.14	4.68**	1.67	-0.13	1.25	1.42	1.79	0.37	2.03	-0.09	0.31	0.86	-2.66
	(1.27)	(1.46)	(1.71)	(1.61)	(1.72)	(1.43)	(2.04)	(1.94)	(1.29)	(1.36)	(1.66)	(1.55)	(1.21)	(3.07)	(1.12)	(0.89)	(2.20)	(2.55)	(1.07)	(1.72)	(0.77)	(1.81)	(1.63)
Equally	3.27**	-1.96	-3.25*	2.17	3.49*	1.32	1.46	-2.44	0.84	2.59*	1.61	6.06***	3.98***	-1.69	3.43***	4.49***	2.27	0.60	3.38***	3.47*	0.24	0.88	-0.76
	(1.13)	(1.24)	(1.34)	(1.54)	(1.61)	(1.26)	(1.77)	(1.70)	(1.04)	(1.20)	(1.53)	(1.43)	(1.05)	(2.79)	(0.95)	(0.79)	(2.04)	(2.46)	(0.92)	(1.46)	(0.64)	(1.57)	(1.36)
Mainly Human activity	3.71***	-1.19	-2.00	2.03	3.62*	0.98	1.72	-1.51	0.76	3.66**	2.42	6.55***	4.52***	-1.10	3.93***	5.39***	3.34	1.20	3.59***	4.15**	1.13	2.26	-0.62
	(1.12)	(1.24)	(1.36)	(1.56)	(1.61)	(1.30)	(1.77)	(1.70)	(1.04)	(1.22)	(1.53)	(1.44)	(1.07)	(2.78)	(0.95)	(0.82)	(2.06)	(2.47)	(0.94)	(1.46)	(0.68)	(1.57)	(1.38)
Entirely Human activity	3.77**	-1.87	-1.33	3.96*	4.68**	-0.13	1.16	-1.06	1.74	3.01*	2.94	7.12***	3.32*	0.11	4.06***	6.49***	3.88	0.33	3.36**	3.00	1.62*	2.75	-0.25
	(1.18)	(1.34)	(1.64)	(1.60)	(1.70)	(1.44)	(1.81)	(1.83)	(1.15)	(1.38)	(1.58)	(1.61)	(1.22)	(3.00)	(0.98)	(0.99)	(2.19)	(2.91)	(1.21)	(1.58)	(0.78)	(1.72)	(1.54)
Interaction: Mainly Natural processes	-0.03	**0.73****	**0.57***	0.06	-0.30	-0.13	0.24	**0.65***	0.23	0.11	0.69	**-0.50***	-0.16	0.04	0.09	-0.21	-0.03	0.06	-0.23	0.38	0.04	0.17	**0.85***
	(0.22)	**(0.28)**	**(0.29)**	(0.29)	(0.28)	(0.25)	(0.39)	**(0.29)**	(0.24)	(0.24)	(0.35)	**(0.24)**	(0.21)	(0.49)	(0.21)	(0.15)	(0.36)	(0.38)	(0.24)	(0.39)	(0.15)	(0.28)	**(0.34)**
Interaction: Equally	-0.18	**0.95****	**0.80****	0.01	-0.14	0.14	0.20	**0.62***	0.23	0.03	0.35	**-0.62****	-0.27	0.52	-0.10	**-0.47****	0.15	0.20	-0.29	0.17	0.11	0.28	**0.64***
	(0.20)	**(0.24)**	**(0.23)**	(0.28)	(0.27)	(0.22)	(0.34)	**(0.26)**	(0.20)	(0.21)	(0.33)	**(0.22)**	(0.19)	(0.45)	(0.18)	**(0.14)**	(0.34)	(0.37)	(0.22)	(0.34)	(0.13)	(0.24)	**(0.30)**
Interaction: Mainly human activity	-0.14	**0.94****	**0.71****	0.15	-0.04	0.30	0.26	**0.59***	0.38	0.02	0.38	**-0.59****	-0.23	0.58	-0.08	**-0.56****	0.07	0.22	-0.24	0.19	0.06	0.17	**0.65***
	(0.19)	**(0.24)**	(0.24)	(0.29)	(0.27)	(0.22)	(0.34)	**(0.26)**	(0.20)	(0.22)	(0.33)	**(0.22)**	(0.19)	(0.45)	(0.18)	**(0.14)**	(0.34)	(0.37)	(0.22)	(0.34)	(0.13)	(0.24)	**(0.30)**
Interaction: Entirely human activity	-0.18	**1.11****	0.54	-0.09	-0.15	0.46	0.40	**0.61***	0.24	0.11	0.34	**-0.61***	0.13	0.51	-0.15	**-0.69****	0.07	0.38	-0.24	0.40	0.08	0.19	**0.68***
	(0.20)	**(0.25)**	(0.28)	(0.30)	(0.28)	(0.25)	(0.35)	**(0.28)**	(0.22)	(0.25)	(0.34)	**(0.25)**	(0.22)	(0.48)	(0.19)	**(0.18)**	(0.36)	(0.44)	(0.28)	(0.36)	(0.16)	(0.26)	(0.33)
Constant	1.30	6.63***	7.93***	0.56	1.78	1.80	3.48*	6.81***	5.44***	2.31*	1.43	-1.22	1.91	6.43*	0.80	0.01	1.51	4.60	1.85*	1.11	1.88**	3.71*	5.49***
	(1.09)	(1.21)	(1.31)	(1.52)	(1.60)	(1.22)	(1.75)	(1.67)	(1.01)	(1.18)	(1.50)	(1.41)	(0.99)	(2.73)	(0.93)	(0.75)	(2.01)	(2.43)	(0.89)	(1.41)	(0.60)	(1.53)	(1.33)
Observations	1,888	1,746	1,473	2,068	2,778	1,920	1,777	1,883	2,006	1,885	1,498	2,555	1,975	853	2,402	1,721	1,634	1,513	1,462	1,207	1,825	1,505	1,254
R^2	0.07	0.09	0.09	0.06	0.09	0.06	0.07	0.10	0.09	0.13	0.08	0.06	0.11	0.11	0.08	0.11	0.12	0.09	0.06	0.11	0.09	0.09	0.03
Adjusted R^2	0.07	0.09	0.08	0.05	0.09	0.06	0.06	0.09	0.09	0.12	0.08	0.05	0.10	0.10	0.07	0.11	0.12	0.08	0.05	0.10	0.08	0.08	0.03

Note: *p<0.05; **p<0.01; ***p<0.001

Of those countries with significant interaction, it is worth taking a closer look at Switzerland, Finland, Slovenia and Belgium. Most of the values of cause of climate change did not change the relationship between social trust and feeling of responsibility for climate change significantly, the differences were small. However, when it comes to participants that believe that climate change is entirely caused by natural processes, they feel more responsible for the climate the less social trust they have, and the

more social trust they have the less responsible they feel (This can be seen in Appendix B Figure 1 of the interactions in Switzerland).

This means that there is a negative relationship between social trust and feeling of responsibility for climate change, the opposite of the assumption this thesis is based on. A tentative explanation for this could be social desirability bias. Where people that have high social trust would be more comfortable showing their true feelings and as they believe climate is caused by natural processes, they would not feel responsible for the climate. Participants that have lower social trust, as this is a controversial social issue may fear what other think about them and although they believe climate change is caused by natural processes, they might not be comfortable stating that they do not feel responsible at all for the climate. Although this is a surprising result and may need further investigation, it applies to a small number of participants (Switzerland, 14 participants; Finland, 25 participants; Slovenia, 25 participants; and Belgium, 20 participants). This indicates that it is more probable that chance or bias influence the result and the regression lines; this is especially likely since the significance in all cases was not extremely high.

Other than the interaction of that value, in the countries where the interactions were significant, there were slight variations but they overall fit the basic assumption that the more social trust the more climate responsibility. There were no other big variations. This means that although the interactions are statistically significant and looking at the plots it seems like the cause for climate change could be a moderator. On closer inspections, the moderation is more likely to happen because of bias and at random because it applies to a minority of participants that sits on the extremes end of the distribution. This leads to the tentative conclusion that cause of climate change is not a moderator.

Hypothesis 4: A higher level of education positively moderates the impact of social trust on feeling on personal responsibility for climate change
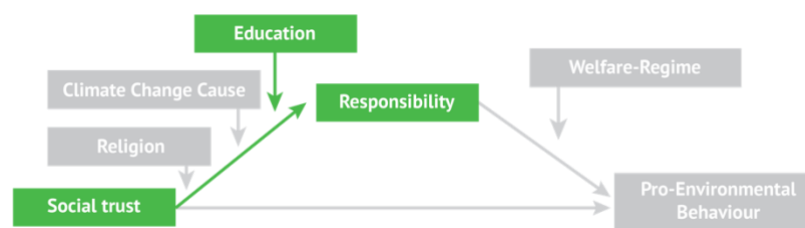
In Table 14 two moderating regressions were done, the first without control variables and the second with. In both of them, the moderating effect is not significant (model 1, p=0.2, model 2, p=0.4), and has a low effect.
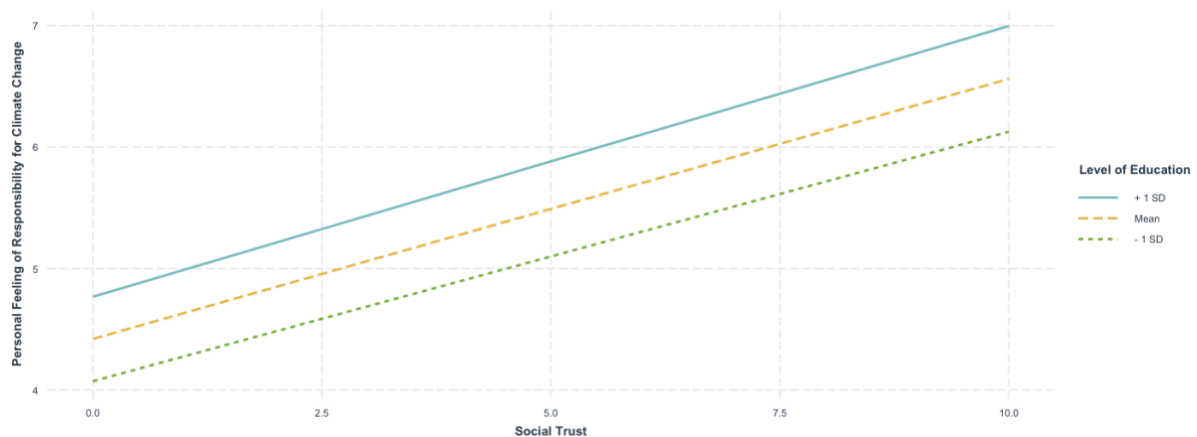
Table 14

Regression – Years in education interaction – with and without controls

	Dependent variable:	
	Sense of personal responsibility for climate change	
	(1)	(2)
Social Trust	0.185*** (0.024)	0.195*** (0.026)
Education	0.091*** (0.011)	0.070*** (0.012)
HH Income		0.072*** (0.006)
Gender		0.160*** (0.029)
Age		-0.006*** (0.001)
Interaction	0.002 (0.002)	0.002 (0.002)
Constant	3.231*** (0.137)	3.202*** (0.168)
Observations	41,202	34,219
R^2	0.049	0.059
Adjusted R^2	0.049	0.059
Residual Std. Error	2.652 (df = 41198)	2.637 (df = 34212)
F Statistic	705.525*** (df = 3; 41198)	356.575*** (df = 6; 34212)
Note:		*p<0.05; **p<0.01; ***p<0.001

Although the interactions are not significant, meaning that the regression lines that can be seen in Figure 13, can be generated at random. It is still helpful to see the interaction in the plot and as can be seen the regression lines are parallel, meaning that years of education do not change the relationship between social trust and the personal feeling of responsibility for climate change. This is the same as the finding of the regression and this means that education does not have a moderation effect on the relationship as was hypothesised. To explore this further, a moderation analysis was done on country level which can be seen in Table 15.

Figure 13

Interaction plot years in education – on relationship between social trust and feeling of responsibility for climate change

There is a significant interaction in Belgium (p=.003), Spain (p=.009), Israel (p=.01), Lithuania (p=.003), Norway (p<.001), and Russia (p= 0.02).

Table 15

Regression – Interaction years of education on country level without controls

	AT	BE	CH	CZ	DE	EE	ES	FI	FR	GB	HU	IE	IL	IS	IT	LT	NL	NO	PL	PT	RU	SE	SI
										Dependent variable:													
										Sense of responsibility for climate change													
Social Trust	0.39**	-0.18	0.12	-0.11	0.01	0.18	0.38***	0.24*	0.01	0.01	0.30*	0.11	0.29	-0.10	0.21**	0.55***	-0.02	-0.43**	0.26	0.19*	0.61***	0.20	0.09
	(0.14)	(0.12)	(0.13)	(0.12)	(0.11)	(0.14)	(0.08)	(0.11)	(0.10)	(0.12)	(0.15)	(0.11)	(0.15)	(0.18)	(0.07)	(0.15)	(0.15)	(0.15)	(0.13)	(0.10)	(0.14)	(0.13)	(0.15)
Years of education	0.22***	-0.04	0.01	-0.01	0.02	0.17*	0.18***	0.11	0.03	0.05	0.19**	0.12*	0.15*	-0.01	0.12***	0.26***	-0.01	-0.16*	0.19***	0.19***	0.20***	0.10	0.11
	(0.07)	(0.05)	(0.07)	(0.05)	(0.05)	(0.07)	(0.03)	(0.06)	(0.04)	(0.05)	(0.06)	(0.05)	(0.06)	(0.09)	(0.03)	(0.06)	(0.07)	(0.08)	(0.05)	(0.05)	(0.05)	(0.07)	(0.06)
Interactions	-0.02	0.03**	0.01	0.02	0.01	-0.001	-0.02**	0.0001	0.01	0.01	-0.01	0.01	-0.03*	0.02	-0.003	-0.03**	0.02	0.04***	-0.01	-0.002	-0.02*	-0.003	0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	2.01*	5.54***	5.24***	3.02**	5.13***	1.02	2.84***	3.50***	5.95***	4.36***	1.27	2.75***	3.71***	5.41***	3.11***	0.92	4.52***	7.71***	2.78***	2.99***	-0.21	4.16***	3.59***
	(0.81)	(0.66)	(0.81)	(0.67)	(0.66)	(0.87)	(0.42)	(0.77)	(0.54)	(0.71)	(0.75)	(0.71)	(0.86)	(1.28)	(0.36)	(0.83)	(0.93)	(1.07)	(0.62)	(0.48)	(0.72)	(0.89)	(0.80)
Observations	1,906	1,743	1,478	2,058	2,782	1,934	1,760	1,879	2,013	1,878	1,529	2,669	2,106	844	2,375	1,727	1,645	1,513	1,479	1,206	1,913	1,508	1,257
R^2	0.05	0.05	0.05	0.01	0.05	0.06	0.06	0.07	0.03	0.04	0.04	0.07	0.005	0.05	0.06	0.02	0.06	0.05	0.04	0.11	0.06	0.04	0.03
Adjusted R^2	0.05	0.04	0.04	0.01	0.05	0.05	0.06	0.07	0.02	0.04	0.04	0.06	0.003	0.05	0.06	0.02	0.06	0.04	0.04	0.11	0.06	0.03	0.02

Note: $^*p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$

What is evident from the interaction plots included in Appendix C, is that the interaction effect varies per country. In the case of Israel, the moderation effect (n=2106), was unexpected. As shown by testing the first hypothesis, Israel is the only country that did not show a significant positive relationship to social trust with feeling of responsibility for climate change. This suggests that the relationship in Israel is very heterogeneous. However, even though the relationship is not significant, the interaction was found to be significant. Highly educated respondents have a negative relationship and are more sensitive to the relationship of social trust and feeling of responsibility for climate change. For less educated people, the evidence shows that the relationship is smaller. To better understand these relationships, it is useful to look at Borgonovi's research on group-threat.

Group-threat theory suggests that the relationship of education will be particularly strong in situations characterized by high levels of collective threat (Borgonovi, 2012, p. 151). Borgonovi found that when there is collective threat, which can be caused by religious and ethnic diversity, more highly educated individuals tend to be less tolerant than less educated individuals (Borgonovi, 2012, p. 162). Group-threat theory is therefore relevant to understanding the relationship in Israel because of the high levels of religious and ethnic diversity as well as the constant presence of conflict. This is then one way of understanding why more highly educated individuals are less concerned with climate change in Israel. However, although this moderation is significant, the relationship it is tested upon is not, therefore, the significance of the interaction should be approached with caution.

As well as in Israel, education was found to be a moderator in five other countries out of the twenty-three countries in this study: Belgium(n=1743), Norway (n= 1513), Spain(n=1760), Lithuania (n= 1727) and the Russian Federation(n=1913). The moderation in these countries varied one from the other, however, they all maintained the basic assumption that social trust has a positive impact on the feeling of responsibility for climate change. Previous studies show that the effect of education indeed varies depending on the country (Huang, van den Brink, & Groot, 2011). Borgonovi found that the relationship between education and trust varies across countries mainly due to the way individuals react to levels of religious, ethnic, and political diversity in their country (Borgonovi, 2012, p. 146). The relationship may differ for three different reasons. The first is different schooling experiences, including different methodological approaches to schooling, different education systems, and different curricula. The second is that the level of personal education interacts with the general level of education of in the

community, which depends on the level of religious, ethnic and socio-economic homogeneity. The third is the context and environment, which refers to the different political, social and institutional context in which the individual operates (Borgonovi, 2012, p. 149). The above differences might explain why education has not been found to be an overall moderator when all countries are measured together. It could also explain why the moderation effects between the countries vary to such a large degree.

An additional explanation is provided by Echavarrena and Telešiene, who also found that there is indeed a large variation between countries. More importantly though, they found that more highly educated individuals from countries at risk of floods and droughts were particularly concerned with environmental problems. This is due to education being correlated to increased knowledge about environmental risks and scientific research, which leads individuals to make more calculated risk analyses regarding their environmental behaviour (Echavarrena & Telešienė, 2019, p. 814). To conclude, although education was a moderator in a few countries, it was not found to be an overall moderator. Therefore, it can be deduced that education does influence the relationship between social trust and the sense of responsibility for climate change in certain countries. However, the moderation pattern in those countries changes depending on the differences in education system, political and social differences, and institutional context.

Hypothesis 5: Higher levels of welfare positively moderate the impact of on feeling of personal responsibility for climate change on pro-environmental behaviour.
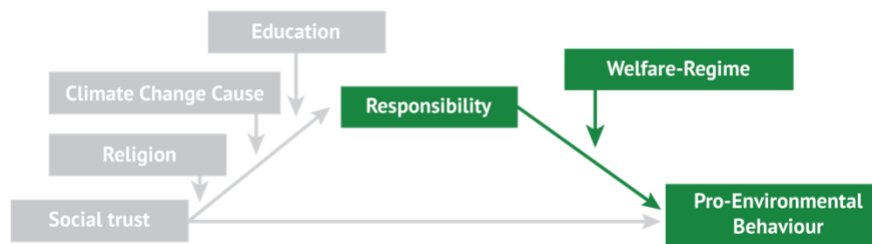
In order to test the hypothesis, two regressions were conducted. In the first regression without controls (n=41,530) in Table 16, the interactions are very significant. The only exception is the Mediterranean welfare regime, which was found to be insignificant (p=0.76). The second regression was done with controls, and the interactions stayed significant. The interaction between Mediterranean and post-socialist welfare regime had a lower p-value and went from (p<.001) without controls, to (p=0.005) with controls. The interaction between post-socialist regime and social-democratic regime increased its significance from (p= 0.004) without controls, to (p=0.0005) with controls. The controls, therefore, partly explain the variation in the interaction. This is also evident in the interaction between liberal and Mediterranean welfare regime, which goes from (p=0.76) to (p=0.61). This shows that the controls do explain a small part of the variation; nonetheless, the interaction is still not significant.

Table 16

Moderation regression – welfare regimes

	Dependent variable:	
	Sense of personal responsibility for climate change	
	(1)	(2)
Social Trust	0.094^{***} (0.002)	0.098^{***} (0.003)
Liberal	0.359^{***} (0.034)	0.379^{***} (0.036)

|		
Mediterranean	-0.164*** (0.037)	-0.161*** (0.039)
Post-Socialist	-0.046 (0.029)	-0.035 (0.032)
Social-Democratic	-0.132*** (0.036)	-0.186*** (0.040)
HH Income		-0.013*** (0.002)
Gender		0.104*** (0.012)
Age		0.010*** (0.0003)
Interaction: Liberal	-0.048*** (0.005)	-0.052*** (0.006)
Interaction: Mediterranean	-0.002 (0.006)	-0.003 (0.006)
Interaction: Post-Socialist	0.016*** (0.005)	0.014** (0.005)
Interaction: Social-Democratic	0.016** (0.006)	0.022*** (0.006)
Constant	3.623*** (0.015)	3.051*** (0.034)
Observations	41,530	34,352
R^2	0.048	0.075
Adjusted R^2	0.048	0.075
Residual Std. Error	1.166 (df = 41520)	1.140 (df = 34339)
F Statistic	233.576*** (df = 9; 41520)	232.645*** (df = 12; 34339)

Note: $^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$

The significance is better understood by the plot om figure 14. The figure shows how welfare regimes change the relationship between the feeling of responsibility for climate change and the intent to reduce energy use.

Figure 14

Interaction plot – Welfare regime as a moderator
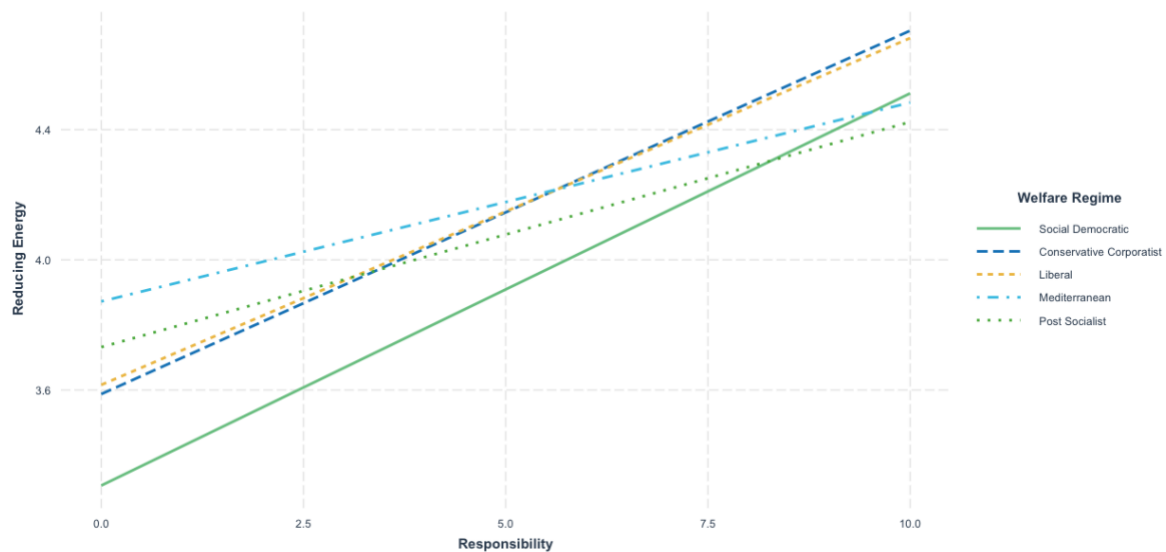
In social-democratic countries, the relationship between the feeling of responsibility for climate change and reducing energy use is the strongest, and even more significant, when adding the controls of age, gender and household income. Therefore, living in those countries is a good predictor of the positive impact a higher feeling of responsibility for climate change has on an individual's intent to reduce energy use. The conservative-corporatist welfare regime also has a highly significant moderation effect that is almost as steep in its slope as the social-democratic countries. The liberal welfare regime has a similar slope; however, it is less steep. In post-socialist countries, the relationship between the personal feeling of responsibility for climate change and the reduction of energy use is much less strong than the other welfare regimes. It is still positive, but there is nonetheless a large difference between the post-socialist welfare regime and the other welfare regimes. A tentative explanation to understand this difference is that in post-socialist countries "benefits of social security are very low… resulting in high

levels of income inequality and poverty" (Rostila, 2007, p. 224), therefore individuals from these countries must rely mainly on family support and the free market (Rostila, 2007, p. 225). Accordingly, it is logical that individuals in post-soviet countries do not feel responsible for climate change, as their priorities are most likely centred on stabilizing their precarious economic situation.

The interaction with the Mediterranean welfare regime was not found to be significant. This can be tentatively explained by the theory of welfare regimes. As discussed earlier, the Mediterranean welfare regime was the fourth regime to be added, and includes a diverse group of countries that do not necessarily share many of the same characteristics. The Mediterranean welfare regime was added because the original three welfare regimes by Esping-Andersen did not accurately represent southern European countries. (Minas, Jacobson, Antoniou, & McMullan, 2014). Grouping all of southern European countries together, however, was problematic, as they did not necessarily share the same institutional structures and welfare systems. Gal (2010, p. 283) claims that Israel and Cyprus are not part of the core Mediterranean family, but should be seen instead as extended family. This can also be seen in the descriptive statistics section, in which the biggest variation in the different variables was among the welfare regime group of Mediterranean countries. The variation between the countries can explain why the interaction here is not significant. The welfare regime is an abstract ideal type to explain the big difference in welfare in European countries. Therefore, the general concept of welfare regimes is too broad to explain what specifically causes the differences between the different welfare regimes when it comes to feeling of responsibility for climate change and reducing energy use. Showing that there are differences is of utmost importance because it addresses the weakness of the concept of pro-environmental behaviour since the field of pro-environmental behaviour is heavily focused on the individual differences and not as much on the contextual differences such as welfare regime. This is merely a first step in exploring those contextual differences.

CHAPTER 5: CONCLUSION

5.1   SUMMARY

This thesis has examined the impact of social trust on an individual's intent to deal with the tragedy of the commons, specifically as it is related to climate change. I use a Large-N design, with round 8 data (Data from 2016) from the European Social Survey. The research question was converted into six different testable hypotheses. These were tested in the previous chapter using mediation and moderation analyses. Here I will summarize the main results.

The direct impact of social trust on pro-environmental behaviour is not consistent. Testing the relationship on the original six scale item, without controls, turns out to be slightly significant, at least to the point that it can be classified as not random. With controls the significance disappears. After simplifying the interpretation and turning the original six scale item into a dichotomous one, the relationship does become significant, even with the inclusion of controls. The country level regression also yields some interesting results, as it shows that only nine countries have a significant relationship. Two of those countries have a negative relationship and three have a positive relationship. This would seem to show that the direct relationship is not as straightforward, positive, or significant as predicted based on the pre-existing literature (Bouman, et al., 2020; Dasi, Miarsyah, & Rusdi, 2019; Punzo, Panarello, Pagliuca, Castellano, & Aprile, 2019; Gür, 2020). This is likely a result of the measurement of the dependent variable of 'pro-environmental behaviour' that is measured with the item of 'intent to reduce energy use'. This issue of measurement is a common flaw in research methodology when addressing pro-environmental behaviour, and often leads to discrepancies in the results (Kollmuss & Agyeman, 2002). Using the mediator 'sense of personal responsibility for climate change, however, appears to yield different results.

Social trust was found to positively and consistently impact the intent to reduce energy use when it is mediated by a 'sense of personal feeling responsibility for climate change'. This impact stayed significant across all the countries except Israel. This finding is what was expected, based on the literature. It confirms the findings of the experiment of Barclay, which found that social trust plays a significant role in an individual's willingness to attempt to solve the tragedy of the commons (Barclay, 2004). Having a consistent significant mediation that stays significant with the addition of controls and across the different countries proves the causal mechanism of the effect of social trust on the intent to reduce energy use. It means that a sense of personal feeling of responsibility is of key importance in order for social trust to positively and consistently influence the intent to deal with the tragedy of the commons.

To understand the context that influences the different relationships, four moderators were tested. The first moderator, religiosity, was tested on the relationship between social trust and a sense of responsibility for climate change. Religiosity was found to be a significant moderator. Higher levels of religiosity are linked to a higher sense of personal responsibility for climate change. Furthermore, individuals with higher levels of religiosity are less influenced by social trust in their sense of responsibility for climate change. Lower levels of religiosity are linked to lower personal feelings of responsibility at lower levels of social trust; however, with higher levels of social trust the differences between higher and lower levels of religiosity disappear. Religiosity, therefore, plays an important role in sense of responsibility for climate change, especially when social trust is not high. The effect varied in strength depending on different countries, but the overall pattern of the effect stayed similar. The

variation in the effect of religiosity depending of the country is a common finding in other research (Nche, 2020, p. 81).

The second moderator on the relationship between social trust and the sense of personal responsibility for climate change is whether climate change was caused mainly by human activity or mainly by natural processes. After testing the moderation, the cause for climate change was not found to be a moderator. It was not significant and did not change the relationship between social trust and the personal feeling of responsibility for climate change. Additionally, a regression was done on the country level to see if perhaps there were countries where cause for climate change was a moderator. In some countries the interaction was found to be statistically significant. In those countries the hypothesized positive effect between social trust and personal feeling of responsibility for climate change became negative at the value of climate change entirely caused by natural processes. This means that there is a negative relationship between social trust and feeling of responsibility for climate change, the opposite of the assumption this thesis is based on. Upon closer analysis, the negative effect is more likely to be a result of bias. It is also more likely to be a result at random, as it applies to a minority of participants who exist on the extremes of the distribution, and is likely to be influenced by desirability bias. This leads to the conclusion that the belief about the cause for climate change does not moderate the relationship.

The third moderator is level of education, which was measured by years of education. The moderation was tested on the relationship of social trust and the feeling of responsibility for climate change. Although in some countries education was found to be a moderator, overall, according to the moderation analysis, education was not found to be significant. This is due to the moderation effect in countries being different from one another, and demonstrates that the moderation of education has a different effect on the relationship depending on the country and socio-political context. This finding is supported by previous research on the topic (Huang, van den Brink, & Groot, 2011; Borgonovi, 2012, p. 146). The role of education may also differ based on methodological approaches in schooling, as well as the religious, ethnic and socio-economic homogeneity, and the political, social and institutional context.

The final moderation is on the relationship between personal sense of responsibility for climate change and reducing energy use by using the moderator 'welfare regime'. Welfare regime was tested with a moderation analysis and was found to be a moderator. The more extensive the welfare regime of the country is, the more positive the relationship becomes. Social-democratic welfare regimes had the most positive relationship, followed by conservative-corporatist welfare regimes, then liberal welfare regimes, and lastly, with the least positive relationship, was the post-socialist welfare regime. Mediterranean welfare regime was not significant, which is likely due to the numerous differences between countries that have a Mediterranean welfare regime. Finding that welfare regime is a moderator is important because it shows that the socio-political context and environment in which an individual lives affects their pro-environmental behaviour. This is an important discovery, because research about pro-environmental is mainly produced in the field of environmental psychology, which places almost exclusive focus on internal processes, rather than the influences of an individual's environment.

Ultimately, social trust was found to have a strong impact on an individual's intent to deal with the tragedy of the commons, specifically as it is related to climate change. This is especially true when the individual has a sense of responsibility for climate change. These findings add to the existing literature by going one step further than the direct connection between social trust and the intent to deal with

the tragedy of the commons. By using the causal mechanism of pro-environmental behaviour, the results show that what mediates the impact is a sense of personal responsibility to solve the problem. What this shows is that, in order to deal with an instance of the tragedy of the commons such as climate change, social trust is important, but what is essential is a sense of personal responsibility for climate change.

5.2 CONCLUSION

The introduction to this thesis began with a verse from Genesis, a command from God to "…fill the earth and subdue it; have dominion over the fish of the sea, over the birds of the air, and over every living thing that moves on the earth." Humanity, in turn, has obliged God's command. We have indeed filled and subdued the earth, and gained dominion over all living things- but at what cost? What was entrusted to us as a sacred responsibility has become a relentless project of exploitation aimed only at short-term gain. As a result, we find ourselves caught in the ultimate tragedy of the commons: an earth under threat from climate change. In the introduction, the question was asked: how can we, flawed humans, with limited knowledge, in this imperfect environment, trust each other enough to take care of the fragile environment around us, and its resources on which we all depend? This thesis cannot answer that question, but it can start to help answer some of the important sub-questions that are necessary to understand the larger issue.

In the countries that were tested, overall, individuals tend to have more generalized trust than not, and most people do feel responsible for climate change and want to do something about it. As Ostrom (2015), notes, even just the use of metaphors for the issue such as "tragedy of the commons", "prisoners dilemma" and "collective action problem" are misleading. They evoke a sense of pessimism and hopelessness regarding the future, predicting a tragic ending. But this is not always the case according to the research from the last two decades (Ostrom, 2015, p. 47). There are clear steps we can take to combat climate change. A large part of the responsibility to act is in the hands of governing institutions, however, individuals also bare a significant responsibility. This thesis has found that the feeling of responsibility of the individual matters consistently across different countries as it increases the likelihood for pro-environmental behaviour, especially when social trust is high.

Humanity is ultimately more vulnerable than the earth which it inhabits. The earth will eventually find its equilibrium again, but whether it will remain hospitable to humanity in the process, or whether it will expel us as Adam and Eve were expelled from Eden, is dependent on our future actions. This thesis has provided some insight as to how our pro-environmental behaviours are determined now, and how they might be able to be altered in the future; however, more research can and must be done to formulate practical solutions.

5.3 PRACTICAL IMPLICATIONS

While the results of this thesis provide intriguing academic insights, there are also more practical implications to the findings. These implications are mostly relevant for decision-making and policymaking on country level and EU level. It should be noted though, that the implications are useful primarily as they provide further information and understanding about the process that leads to an individual's pro-environmental behaviour. The information is not meant to be used directly to create any kind of official policy for countries or broader legislative bodies. The findings presented in this thesis, while useful, represent only some of the necessary information to create effective policy. As

such, they should always be considered within the particular context to which they are being applied and in combination with further research. Nonetheless, there are three implications from this thesis which could be especially useful for informing policy.

The first implication is related to the theory of social capital. Social trust is often the main predictor of social capital, and social trust has been shown to lead to more pro-environmental behaviour through a sense of responsibility for climate change. Analysing which countries have more social trust, and therefore more social capital, gives an indication of which countries will be better able to mobilize collective action to solve the tragedy of the commons. Literature suggests that social capital can complement other tools used by institutions to solve the tragedy of the commons (Uslaner, 2002). Conversely, it can highlight in which countries social capital is lower and where it will be more of a challenge to mobilize collective action.

The second implication is that the moderating variables provide more insight into what influences the relationship between social trust, responsibility for climate change and pro-environmental behaviour. In some countries, regardless of whether social trust is low or high, the sense of responsibility for climate change remains the same if the country has higher levels of religiosity. This means that in communities with low levels of social trust, religious leaders can help mobilize individuals to engage in more pro-environmental behaviours. Similarly, regardless of levels of social trust, higher levels of education are linked to a higher sense of responsibility for climate change. Therefore, it could be recommended that governments should consider creating more educational programs that inform individuals about the impact of climate change and what behaviours can help reduce this impact.

Finally, the third implication is linked to individuals' sense of responsibility for climate change. According to the literature, social trust is often quite difficult to increase in a society, and mere awareness of the issue of climate change does not lead to more pro-environmental behaviour (Rajecki, 1982). However, an individual's sense of responsibility for climate change has been found to be much easier to influence by comparison. This is of practical significance because sense of responsibility for climate change has a strong and consistent impact on pro-environmental behaviours, and therefore future research could investigate how best to increase an individual's sense of responsibility for climate change.

5.4 LIMITATIONS

Although the current study provides interesting insights, several limitations should be kept in mind. The main limitations are three-fold. Firstly, the operationalization of pro-environmental behaviour. To measure pro-environmental behaviour, a proxy variable of intention to reduce energy use was chosen. When comparing the results for the direct relationship in this research to results in other studies, there was a clear discrepancy in results. This is a common issue with the measurement of pro-environmental behaviour (Kollmuss & Agyeman, 2002). It is compromising to this thesis because I cannot be sure about the accuracy of some results. This regards the direct effect of social trust with pro-environmental behaviour more than the mediation. This is because the mediation by sense of responsibility for climate change compliments the lack of focus on the intent to deal with climate change in the proxy variable of intent to reduce energy use.

Secondly, instead of testing all the moderations and mediation in one model, in this thesis I test the moderation effects separately from each other and separately from the mediation. This has the advantage of being able to look closely at each moderation separately from the influence of other

variables. But conversely, the disadvantage is that it does not give a good overview of the model, which moderations have more impact than others and what the impact is on the mediation.

Thirdly, this thesis does not explain sufficiently how the pro-environmental behaviour addresses the tragedy of the commons. The individual pro-environmental behaviours do not necessarily explain the aggregate differences in dealing with climate change or collective action (Stern, 2011, p. 307). In this sense, there is a gap between the study of pro-environmental behaviour and the study of the tragedy of the commons, especially in big issues such as climate change. Although this thesis is trying to connect between the two, it does not address that gap sufficiently.

5.5 Further research

Although there is much important information gained from this thesis, there are still several areas that warrant further research.

Firstly, it would be advisable for future research to focus on how to connect an individual's pro-environmental behaviour to the theory of collective action that was developed from the theory of the tragedy of the commons. This would help explain how individual action is linked to solving a wicked problem, such as climate change.

Secondly, in combination with finding a better way to connect pro-environmental behaviour to the theory of the tragedy of the commons, it would be useful to replicate the mediation of this research as an experimental design. This could be used to test different monetary, social and time costs that are associated with the behaviour. Testing not just the intended behaviour, but also the behaviour itself, could provide insights with important practical applications.

Thirdly, when addressing the theory of welfare regime, it is worth looking at the Mediterranean welfare regime more closely. It is an addition to the original three welfare regimes by Esping-Andersen (1999), and has not been tested widely. In this thesis, it showed less consistency and more variation than other welfare-regimes. Further research would be useful to clarify why these inconsistencies and variations exist.

Finally, when testing country-specific characteristics with social trust and sense of responsibility for climate change, and when testing for the moderators of education and religion, Israel defied the theoretical expectations. This shows that there is an aspect of social trust that is not yet properly understood, and which the current literature does not address. Previous tentative explanations have suggested this could be due to geographical differences and the ongoing state of conflict in Israel. Further research, however, is needed to verify these assumptions.

Secondly, I would like to thank the people that supported me through the process of writing a thesis amidst a global pandemic. Catherine Merlen, Mattea De Munnich, Jane De Munnich, David-Jan van den Berg, Jort Klarenbeek, Maxine Lukas and Giulia Cretti. I am incredibly honored to have such an amazing support network.

The photos that are in the cover are:

1. Cuba industrial area (22-02-2016) – the dilemma. Cuba, and especially its water sector is vulnerable to climate variability. Yet, the oil refineries and cement and nickel plants cause high level of pollution that worsen the climate variability.

2. Birds in Scheveningen (15-02-2021) – Symbol of hope. As an optimist, I see a lot of hope for the future, better technologies, improving communication and bridging differences.

3. New-Years fire on my street in Scheveningen (01-01-2021)- Mistrust. In Duindorp and Scheveningen there is a mistrust of the out-group, the city of the Hauge. This shows the consequence of mistrust, burning the street on which you live.

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The moderation of religiosity on the relationship between social trust and the feeling of personal responsibility for climate change.

Figure 1
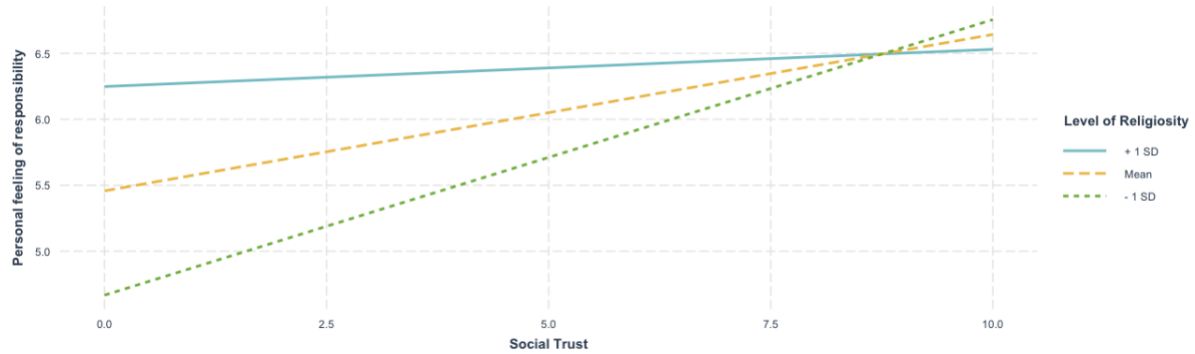*Interaction plot moderation religiosity - Norway*

Figure 2
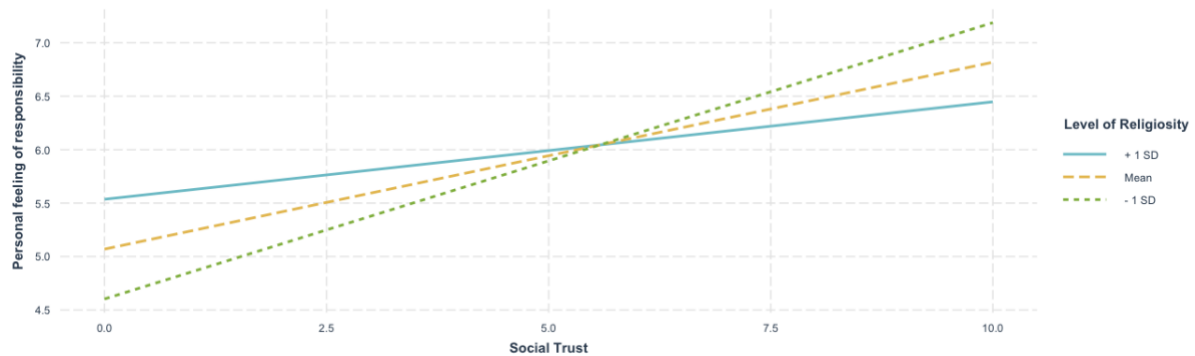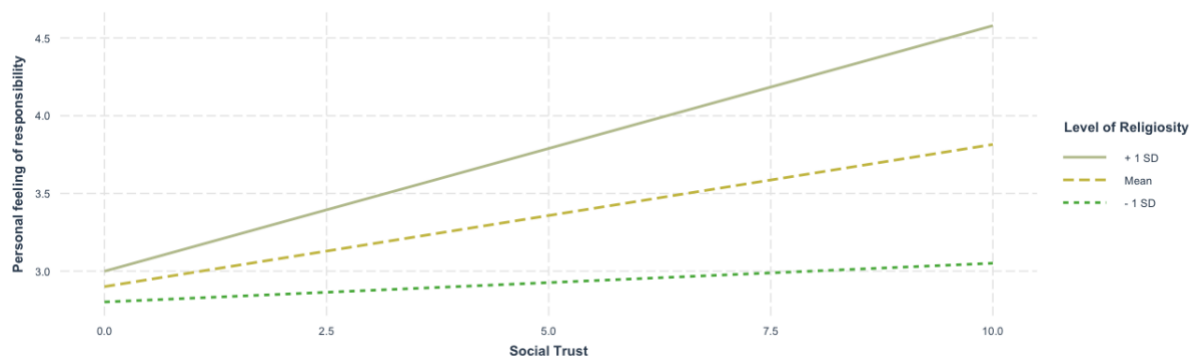*Interaction plot religiosity - Belgium*

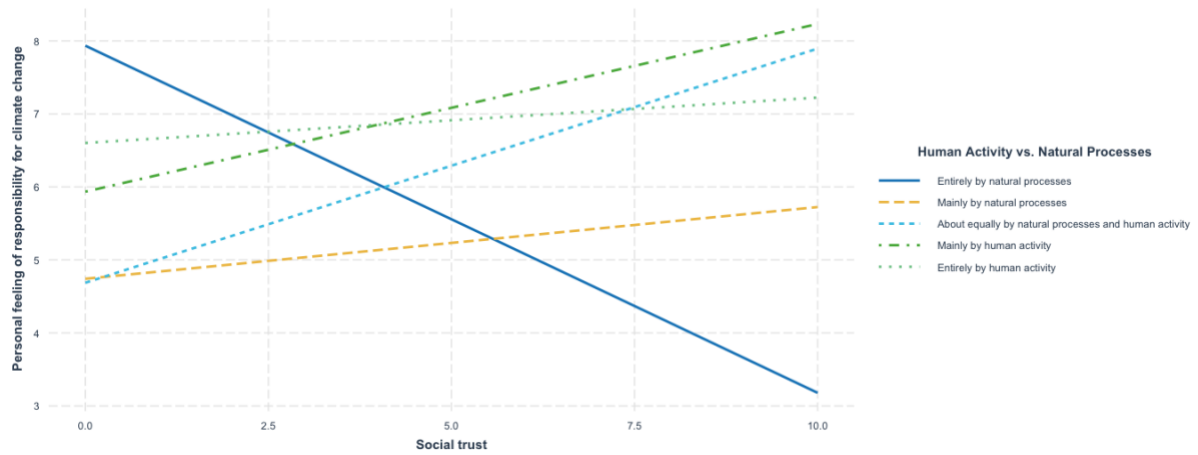**Figure 3**
Interaction plot religiosity – Czech Republic

The interaction in Norway, Finland, Russia, Germany and Iceland is similar to the overall interaction, with the exception that the slopes are steeper. This means that the effect of religion on the relationship between social trust and the personal feeling of responsibility is even more visible in these countries, especially when social trust is lower. The higher level of religiosity is more constant and only slightly increases when social trust increases. Taking a closer look at the differences between individual countries, we can see that in Russia this pattern is occurring with lower levels of personal responsibility and lower levels of social trust. By contrast, in Finland, Germany and Iceland the same pattern is

occurring with higher levels of social trust and personal responsibility for climate change. In Belgium and Ireland, the interaction is similar; however, the point of interaction is closer to the middle of social trust, rather than at the high end of social trust. The Czech Republic is the only country where the interaction is extremely significant but the interaction effect is different than the rest of the countries with a significant interaction. Here, the higher levels of religiosity allow for a bigger impact of social trust on personal feeling of responsibility. Lower levels of religiosity make the relationship between social trust and personal feeling of responsibility less strong.

Figure 1
Switzerland - Interaction plot causes of climate change – human activity vs. natural processes

Figure 1
Belgium - Interaction plot years in education – on relationship between social trust and feeling of responsibility for climate change
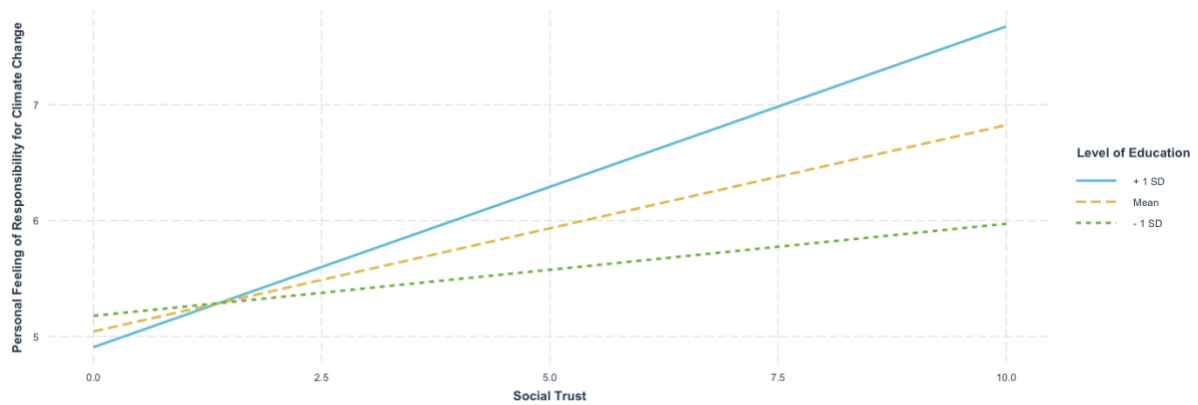

Figure 2
Norway - Interaction plot years in education – on relationship between social trust and feeling of responsibility for climate change

Figure 3

Spain - Interaction plot years in education – on relationship between social trust and feeling of responsibility for climate change
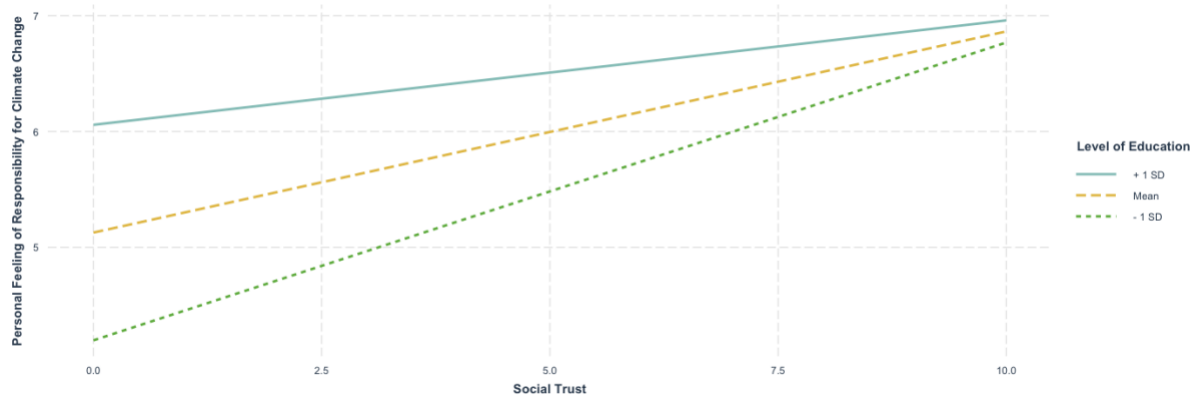

Figure 4

Lithuania - Interaction plot years in education – on relationship between social trust and feeling of responsibility for climate change
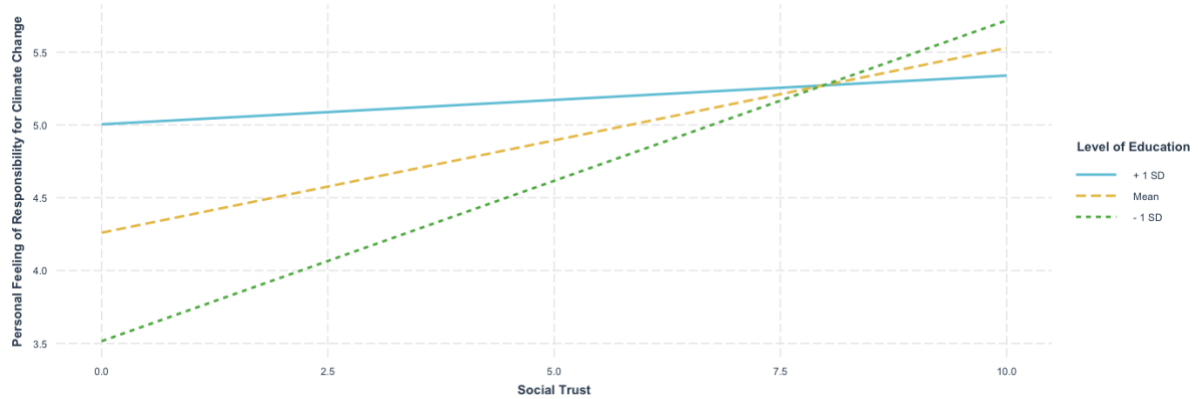

Figure 5

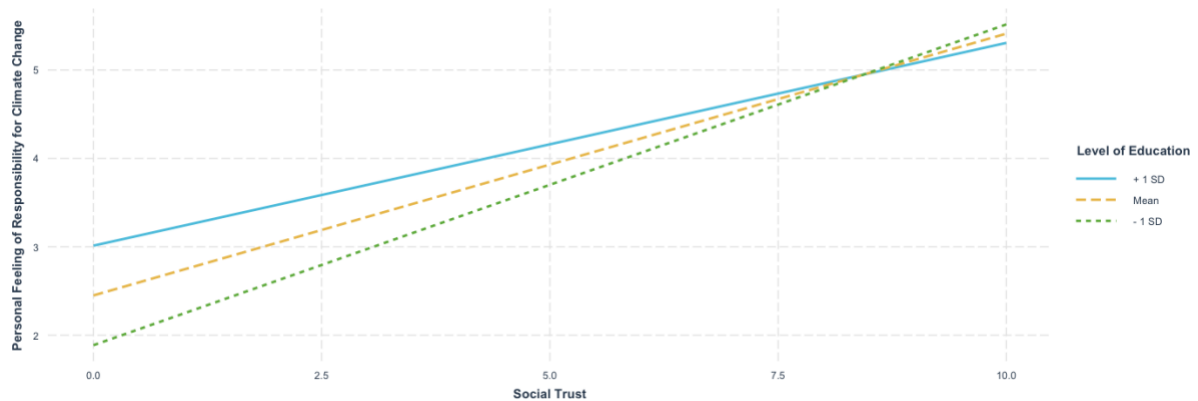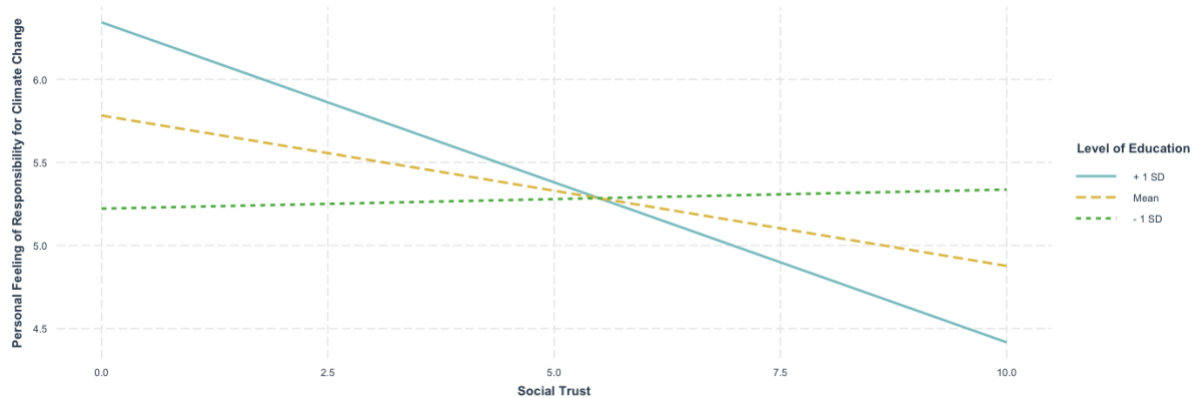*Russian Federation - Interaction plot years in education*

Figure 6

Israel - Interaction plot years in education – on relationship between social trust and feeling of responsibility for climate change

APPENDIX D

Table 1

Confidence interval upper lower

Lhs		rhs	label	est	se	z	p-value	Ci- lower	ci-upper
rdcenra	~	soctru	c	-0.16	0.003	-4.791	0.000	-0.023	-0.010
ccrdprs	~	soctru	a	0.246	0.008	32.511	0.000	0.232	0.262
rdcenra	~	ccrdprs	b	0.92	0.002	39.189	0.000	0.087	0.096
rdcenra	~~	rdcenra		1.364	0.009	154.961	0.000	1.347	1.383
ccrdprs	~~	ccrdprs		7.160	0.043	165.048	0.000	7.075	7.245
soctru	~~	soctru		3.368	0.000	NA	NA	3.368	3.368
ab	:=	a*b	ab	0.023	0.001	24.307	0.000	0.021	0.025
total	:=	c+(a*b)	Total	0.006	0.003	1.878	0.060	0.002	0.013

An additional model (Figure 6) was run to look at the confidence interval of the first regression. This means that if I was to repeatedly draw a random sample from the same population with the same size and fit with the same model, 95% of confidence intervals would contain the population value. What I'm specifically after in Table 6 is the lower confidence interval and upper confidence interval of the mediation effect (a*b). These are .021 for the lower confidence interval and 0.025 for the upper confidence interval. This means that for the mediation effect I cannot be 95% confident that the true value of the mediation slope is between .020 and .024. However, I can be confident that if I re-fit the model with 100 random samples of the same size, approximately 95% of the confidence intervals would contain the population value for the slope.