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A Quantitative Analysis Using Data from the European Social Survey

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TABLE OF CONTENTS

1. INTRODUCTION 1

2. THEORETICAL FRAMEWORK 4

2.1. REPRODUCTIVE DECISION-MAKING 4

2.1.1. Economic and Demographic Theories 4

2.1.2. The Influence of Personal Values and External Factors 6

2.1.3. Psychological and Life Course Perspectives 8

2.2. ENVIRONMENTAL ATTITUDE CONCEPTUALIZATIONS 9

2.2.1. Cognitive Dimension 11

2.2.2. Affective Dimension 12

2.2.3. Behavioral Dimension 12

2.3. LINKING ENVIRONMENTAL ATTITUDES AND FERTILITY 13

2.3.1. Mechanisms Linking Environmental Attitudes to Fertility 13

2.3.2. Changing Environmental Concern Across the Life Course and Over Time 15

2.3.3. Empirical Evidence and Gaps 17

3. ENVIRONMENTAL ATTITUDES, FERTILITY TRENDS, AND POLICY CONTEXTS 20

3.1. GLOBAL ENVIRONMENTAL ATTITUDES 20

3.1.1. Environmental Attitudes in Europe 21

3.1.2. Environmental Policies in Europe 22

3.2. GLOBAL FERTILITY 23

3.2.1. Fertility Levels in Europe 23

3.2.2. Family Policies and Welfare Regimes in Europe 24

4. RESEARCH QUESTIONS AND HYPOTHESES 26

5. DATA AND METHODOLOGY 27

5.1. THE EUROPEAN SOCIAL SURVEY 27

5.2. MEASURES 27

5.2.1. Dependent Variables (Fertility Behavior) 27

5.2.2. Independent Variables (Environmental Attitudes) 28

5.2.3. Control Variables (Demographic and Socioeconomic Variables) 29

5.3. METHODS 31

6. RESULTS 34

6.1. Descriptive Analysis 34
6.1.1. Description of the Samlpe 34
6.1.2. Attitudes towards Climate Change 36
6.1.3. Bivariate Relationship: Climate Variables & Fertility Variables 39
6.1.4. Correlation between Climate Variables 41
6.2. Regression Analysis 43
6.2.1. Logistic Regression Analysis of Fertility Intentions by Climate Worry 43
6.2.2. Multinomial Regression Analysis of Number of Children by Climate Worry 55
6.3. Sensitivity Analysis 65
6.3.1. Logistic Regression 65
6.3.2. Multinomial Regression 65
7. DISCUSSION 66
7.1. Limitations 68
7.2. Future Research and Recommendations 70
8. CONCLUSION 71
9. APPENDICES 73
Appendix A: Abstract in English 73
Appendix B: Abstract in German 74
Appendix C: List of Figures 75
Appendix D: List of Tables 76
Appendix E: Descriptive Results 77
Appendix F: Robustness Checks 80
Appendix G: Summary of Research Questions, Hypotheses, and Findings 88
BIBLIOGRAPHY 89

1. INTRODUCTION

One of the many crises Europe is currently facing is climate change and low fertility rates. Europe is one of the fastest warming regions in the world (Wang et al., 2022) and climate change is increasingly seen as an existential threat (European Commission, Directorate-General for Climate Action, 2025). Meanwhile, fertility rates across all European countries have fallen considerably below replacement level, which threatens the sustainability of labor markets, healthcare, and pension systems (Bujard, 2015).

Declining fertility is not only a demographic concern but also a social and moral issue, as it reflects changing attitudes toward family formation, future uncertainty, and responsibility toward future generations (Schneider-Mayerson & Leong, 2020). At the same time, climate change has increasingly become part of people's ethical reasoning and life planning, particularly among younger adults (Jylhä, Kolk, & Fairbrother, 2025). Some individuals report feeling hesitant about having children due to fears about environmental conditions, future resource scarcity (Arnocky, Dupuis, & Stroink, 2012), and concerns about the well-being of future generations (Schneider-Mayerson & Leong, 2020). This raises an important question: *Does climate worry actually influence reproductive behavior?*

Existing research has examined the link between environmental attitudes and fertility, but the findings are mixed. Some studies suggest that climate concern may lead to lower fertility intentions or voluntary childlessness (e.g., Arnocky et al., 2012; Golovina & Jokela, 2024; Powdthavee et al., 2024; Bastianelli, 2024), while others find no relationship or even a positive association (e.g., De Rose & Testa, 2015; Jylhä, Kolk, & Fairbrother, 2024; Szczuka, 2022). Furthermore, it is also unclear whether this association, if it exists, is universal or depends on individual and societal conditions.

From a life-course perspective, environmental attitudes may be most relevant during key reproductive years, when individuals actively make decisions about family formation (Elder, 1998). Similarly, welfare institutions may shape how individuals consider the environmental, economic, and social consequences of childbearing. Supportive family policies, childcare services, and economic security may lower the perceived risks of having children, even for those who are concerned about the environment (Badolato et al., 2024).

This study addresses these gaps by examining whether environmental attitudes – specifically levels of climate worry – are associated with fertility behavior across Europe, focusing on both the transition to parenthood and variation in family size. It further investigates whether this association differs across welfare regime types and across sociodemographic groups,

particularly across life-course stages. Using cross-sectional data from three waves (8, 10, and 11) of the European Social Survey (ESS) covering 19 European countries, the study explores whether climate worry plays a stronger role during the main reproductive years (ages 25-34), when individuals are actively making family formation decisions.

By addressing these questions, the research contributes to understanding of how emerging environmental concerns intersect with demographic behavior, offering insights that may inform both policy debates and guide future studies on fertility dynamics in an era of growing climate awareness.

The analysis particularly tests whether higher levels of climate worry are linked to a lower likelihood of having children or having larger families, and whether this relationship varies by institutional context or life stage. This thesis is guided by the following sub-questions: (1) *Is climate worry associated with the likelihood of (a) having ever had children and (b) the number of children individuals have?* (2) *Does the association between climate worry and fertility behavior differ across sociodemographic groups, particularly across life-course stages?* (3) *Does the association between climate worry and fertility behavior differ across European welfare regime types?*

This thesis is structured as follows: Chapter 2 presents the theoretical framework, beginning with different approaches to reproductive decision-making, including economic, demographic, value-based, contextual, psychological, and life-course perspectives. It then conceptualizes environmental attitudes by outlining key theoretical approaches and introducing the widely used three-dimensional model of environmental attitudes (cognitive, affective, behavioral). The chapter then links environmental attitudes to fertility by examining how lifestyle-related sustainability considerations and psychological or emotional concerns may impact reproductive decisions. It concludes by reviewing existing research on the links between climate concern and fertility and identifying the gaps that this thesis addresses.

Chapter 3 provides the broader societal background by outlining global and European trends in environmental attitudes and fertility behavior, while also examining environmental policies, family policies and welfare regime typologies to contextualize institutional differences across countries.

Chapter 4 defines the research questions and hypotheses that form the analytical framework of the study. Chapter 5 describes the data and methodology, starting with an overview of the European Social Survey, including the measurement of dependent, independent, and control variables – how survey questions were framed, how variables were scaled, and how responses were recoded. The chapter then presents the analytical methods, including descriptive statistics and regression analysis.

Chapter 6 presents the empirical results. It begins with descriptive findings, including an overview of the sample, distribution of climate-related variables, and bivariate analyses exploring relationships between environmental and fertility variables. It then reports trivariate analyses and chi-square tests to assess correlations between climate variables. This is followed by logistic and multinomial regression models, including robustness checks.

Chapter 7 discusses the findings in relation to the research questions, theoretical expectations, previous literature, and outlines the study's limitations as well as directions for future research. Finally, Chapter 8 provides the conclusions and summarizes the key contributions.

2. THEORETICAL FRAMEWORK

2.1. Reproductive Decision-Making

Exploring the literature about reproductive decision-making is essential to understand childbearing motivations. Rotkirch (2020) argues that in wealthy and liberal democracies, the main factor influencing fertility is the individual desire to have children, because those who do not want to have children can usually do so without facing social stigma. Fertility decision-making however, is explained by multiple theories, including rational choice theory, value-based approaches, socio-economic influences, and psychological considerations.

This chapter explains how different theories approach the question of why people decide to have children, and how modern issues like environmental worries and climate change might increasingly affect those choices.

2.1.1. Economic and Demographic Theories

The rational choice theory on fertility applies economic and other decision-making principles to explain why individuals or couples choose to have children. It assumes that people make deliberate, cost-benefit calculations about fertility, based on their personal goals and constraints. Both Becker's, Caldwell's, and Easterlin's models contribute to this understanding by explaining how economic factors influence reproductive choices.

In classical population theory, Thomas Malthus, in *An Essay on the Principle of Population* (1798), argues that population grows exponentially while food supply grows only linearly, leading to resource shortages and poverty. Population growth is controlled through positive checks (famine, disease, war) that increase mortality and preventive checks (delayed marriage, reduced fertility) that limit births. However, the model has faced criticism, because it could not predict decreasing fertility rates in modern economies despite dramatic increases in per-capita income. As Becker (1991, p. 137) notes, "the Malthusian theory ignores quality and assumes that the demand for births (or number of children) is highly responsive to changes in income (hence, the demand for other commodities may be negatively related to income)."

Becker´s Rational Choice Model on Fertility

Gary Becker develops his approach to why fertility decreased while income increased in the 1960s, directly challenging Malthus´ theory. In his book – *A Treatise on the Family* (1991) – Becker applies rational choice theory to fertility, arguing that households make rational decisions about family size by weighing the costs and benefits.

According to his Quality-Quantity Tradeoff model (1991), the utility derived from children involves both emotional satisfaction and economic costs, which vary depending on the number of children and the resources invested in them. As income rises, parents may choose to have fewer children but invest more in each child's quality, e.g., through education, healthcare, and overall well-being. This explains why wealthier societies often have lower fertility rates (Becker, 1991).

Caldwell´s Wealthflow Theory

John Caldwell's Wealth Flow Theory (1976) extends the rational choice framework by explaining fertility decisions based on the direction of wealth transfer between generations. He argues that in traditional societies, wealth flows from children to parents (through labor, financial support, and security in old age) are keeping fertility high. However, in modern societies, wealth flows from parents to children (through education, healthcare, and upbringing costs) are leading to lower fertility rates as children become more expensive rather than beneficial.

Easterlin's Socioeconomic Theory of Fertility

Richard A. Easterlin developed the Easterlin Hypothesis, linking economic conditions and relative income to fertility decisions. According to him (1975), there are three determinants of fertility: (1) the demand for children, (2) the potential output of children, and (3) the cost of family regulation.

The demand for children is the number of surviving children parents would want if family regulations were costless. The potential output of children is the number of surviving children parents would have if they did not delibaretly limit fertility. And finally, ”fertility regulation involves contraception and abortion (...) A couple's motivation to control fertility is a positive function of the degree to which supply exceeds demand. Whether motivation leads to positive action (to control) depends on the strength of motivation and fertility regulation costs” (Namboodiri & Wei, 1998. p. 43).

Easterlin's framework suggests that fertility decisions are influenced by a complex interplay of economic conditions, individual desires, and the costs of regulating family size (Easterlin, 1975).

Taken together, these theories show that fertility decisions are shaped not only by how people weigh costs and benefits, but also by how they perceive and respond to different forms of risk. This is relevant for the thesis because environmental attitudes can act as another factor people consider when thinking about having children. By understanding how earlier theories explain the role of economic pressures, family expectations, and personal motivations in fertility

decisions, we we can better examine how modern concerns like climate change may influence fertility behavior in Europe today.

2.1.2. The Influence of Personal Values and External Factors

Value-based approaches to fertility decisions emphasize that choices around reproduction are not only economic but are also shaped by cultural, religious, social, and personal values, with individuals making decisions based on their broader worldview and societal context.

Cultural and Religious Values

According to Buhr and Johannes (2014), fertility occurs within a network of interdependent social relationships and social groups changing over time, ranging from intimate relationships to broader cultural expectations.

Fertility decisions are strongly influenced by societal expectations. In some cultures, larger families are valued, while in others, smaller families might be preferred. Having more children however, can be encouraged by offering supportive family policies and institutions, ensuring stable economic opportunities for young workers, and promoting higher gender equality to create a more inclusive environment for reproductive choices (Badolato, Billari & Liefbroer, 2024).

Religious beliefs also play an important role in family formation. Research made by Li Zhang (2008) found that religious beliefs have a positive effect on fertility for both men and women. "This (...) must have something to do with the role of religion in guiding human behavior in terms of the issues of sexuality, cohabitation, marriage, and the function of family" (Zhang, 2008, p. 254). For example, Catholicism promotes large families and strongly opposes abortion, while Mormon theology highlights the essential role of the family within the religious community (Zhang, 2008).

Gender Roles and Expectations

In many societies, gender roles define the expected roles of women and men in childbearing and family life. According to the male breadwinner model, women reduce or give up paid work after becoming mothers, while men continue full-time employment. Although these patterns remain present, rising female education and improved employment opportunities have changed the opportunity costs of parenthood (Burh & Johannes, 2014). As Buhr and Johannes (2014) note, women’s increased career possibilities can make it more likely that they postpone childbearing or have fewer children. Similar shifts may also occur among men as they take on more family responsibilities. Overall, greater gender equality and women’s empowerment often contribute to delayed fertility and lower family size.

Individual and Societal Ideals

Decisions about having children are increasingly shaped by modern values that emphasize personal goals and individual freedom. According to the Second Demographic Transition (SDT) theory, “the postponement of parenthood is rooted in the shift toward postmodern attitudes and norms, with individualistic values seen as the principal determinants of fertility and family choices” (Badolato et al., 2024, p. 3).

The SDT is therefore based on the rise of the higher order needs. Once basic material needs are fulfilled, higher income and education levels lead people to focus on deeper personal and emotional needs and prioritize self-actualization, individual autonomy, and recognition over traditional family formation (Lesthaeghe, 2014). These changing ideals influence how individuals view parenthood. For example, Alcaraz, Hayford, and Glick (2022) found that adolescents who desire more education tend to want fewer children.

In recent years, work has also become more central in many people’s lives in wealthy societies. Data from the Integrated Values Survey shows that the perceived importance of work has risen in countries such as Norway, Sweden, and Finland, while fertility rates have stagnated or declined (DeRose & Stone, 2021). This suggests that many people may now place greater value on meaningful work than on starting a family, leading them to have fewer children or to remain childfree (DeRose & Stone, 2021).

Economic and Social Instability

Fertility decisions are strongly influenced by growing economic and social instability as well. As Buhr and Johannes (2014) note, current decision-making is influenced by expectations and the anticipation of future risks, leading many individuals to delay or reduce their childbearing intentions when they face uncertainty.

Research in developed countries shows that economic downturns negatively affect fertility: changes in GDP, unemployment, and consumer confidence have a strong impact on fertility trends (Sobotka, Skirbekk, & Philipov, 2011). This suggests that fertility decisions are deeply connected to feelings of security or insecurity about future conditions, rather than purely economic realities (Powdthavee, Oswald, & Lockwood, 2024).

Environmental and Ethical Considerations

Some people may be influenced by ethical concerns about population growth and the environment, leading them to limit their family size to reduce their environmental footprint.

Concerns about the environmental consequences of rapid population growth date back to the 1960s and 1970s (Pierce & Jameton, 2003). In his book, *Population Bomb* (1968), Paul Ehrlich

writes about the carrying capacity of the environment. He predicts that global overpopulation would lead to mass starvation, resource depletion, and environmental collapse. He raises awareness about overpopulation and suggests population control and coercive measures, such as sterilization and a child tax (Ehrlich, 1968). However, the “population bomb” has not turned out to be the disaster that Ehrlich projected, due to demographic changes in the developing world: the population growth rate has decreased since the 1980s (Pierce & Jameton, 2003).

Instead, according to Pierce and Jameton (2003) the more pressing question today is how family size – and the increased consumption that comes with having a larger family – might impact global warming. This shift in focus, influenced by growing environmentalism, has led researchers to explore the factors influencing fertility rates in today´s societies.

2.1.3. Psychological and Life Course Perspectives

Understanding fertility decisions also requires attention to psychological processes and how motivations change over time. While economic and value-based theories emphasize external influences, psychological approaches focus on internal factors (such as desires, fears, and long-term goals) that shape reproductive behavior. These phychological models explain how motivations shift in response to life events and growing ethical or environmental concerns related to childbearing.

Traits-Desires-Intentions-Behavior Model

Miller’s Traits-Desires-Intentions-Behavior (TDIB) framework offers a structured psycological approcah for understanding how reproductive motivations unfold over time (Miller, 1995, 2011). The framework’s main idea is that people’s motivations for having children follow a sequence of steps:

> (...) non-consious motivational dispositions (traits) to have or not have children, which lead to conscious desires to have children or not, which in turn lead to conscious intentions to have children or not, which finally lead to the performance of behaviours that are instrumental in the achievement or avoidance of the childbearing (Miller, 2011, p. 76).

Miller distinguishes clearly between desires and intentions: desires are what people want, while intentions reflect what the actually plan to do – recognizing that these do not always match because of external constraints or life circumstances (Miller, 2011).

Importantly, Miller´s research identifies ”fears and worries of parenthood” as a major source of negative childbearing motivation, including worries about the child´s future health and safety

(Miller, 1995). This dimension creates a direct link to environmental concerns, as individuals may experience climate-related anxieties when considering the well-being of future children.

Life Course Theory

Complementing the TDIB framework, life course theory offers a broader sociological view on how fertility motivations develop and change over time. Pioneered by Elder (1998), this approach highlights that decisions about having children are shaped by the timing of life events, historical context, and transitions between life stages, such as education, employment, or partnerships. It argues that reproductive behavior must be understood within the overall trajectory of a person's life: when key events occur, how they interact, and how social norms influence their meaning (Elder, 1998).

Social expectations play a key role in this process. Hayford (2009) argues that young women often lack certainty about their future family lives, education, and careers, and therefore tend to base their fertility intentions more on common social norms than on clearly defined personal preferences.

As Elder points out, according to conventional expectations, some events are "out of order" (too late or too early) which can have negative effects on life changes (Elder, 1998). From a life-course perspective, problems can add up when one difficult event leads to another. For example, becoming a mother in early adolescence can lead to leaving school early, which then limits later employment options. Whether these disadvantages continue to build depends on how the young mother responds to her situation (Elder, 1998).

Overall, this approach is useful for understanding how fertility motivations may shift as people move through different stages of the life course, shaped by their experiences, relationships, and changing priorities.

2.2. Environmental Attitude Conceptualizations

In order to understand how environmental attitudes are defined and measured, it is crutial to explore the literature from the environmental psychology field. Environmental psychology looks at the range of complex interactions between humans and the environment (Kollmuss & Agyeman, 2002).

According to Kaiser, Wölfing, and Fuhrer (1999), psychologists focus on individual behavior rather than societal behavior, leading them to explore questions such as what influences an individual's ecological behavior. In the past, several theories have tried to describe factors that influence behavior – this chapter examines these in more detail.

The Theory of Reasoned Action

The theory of reasoned action – a psychological model developed by Fishbein and Ajzen (1980) – explains how attitudes and social norms influence human behavior. It suggests that a person's intention to perform a behavior is the most immediate predictor of that behavior. This means that if a person has a strong intention, they are more likely to carry out the behavior. This intention is shaped by knowledge and social norms (Fishbein & Ajzen, 1980).

According to this model, the more a person knows about an issue, the more likely they will act toward a goal. However, the assumption that knowledge is linked to attitudes and that attitudes are linked to behavior has not been proven true. ”Human behavior is difficult to predict, and single constructs such as attitudes cannot accurately forecast behavior” (Cottrell, 2003, p. 350).

Value-Belief-Norm Theory

Paul C. Stern (2000) developed a Value-Belief-Norm (VBN) theory that explains how individuals develop pro-environmental behavior based on their values, beliefs, and moral norms. According to this theory, a causal chain of variables leads to environmental behavior: personal values, beliefs (consisting of an ecological worldview, adverse consequences for valued objects, and perceived ability to reduce threat), and personal norms for pro-environmental action.

”Personal norms to take pro-environmental action are activated by beliefs that environmental conditions threaten things the individual values (AC) and that the individual can act to reduce the threat (AR). Such norms create a general predisposition that influences all kinds of behavior taken with pro-environmental intent” (Stern, 2000, p. 413).

This model focuses on rational decision-making but emotions can often often be stronger motivators for action. Research by Schultz (2000) has shown that concern for environmental problems is fundamentally linked to the degree to which people view themselves as part of the natural environment.

Multicomponent Model of Attitude

The most used and most influential model uses three components of environmental attitude – cognition, affect, and behavior – to predict either environmental attitude or ecological behavior. This model builds on the proposition that attitudes are evaluations based on beliefs, feelings, and past behavior (Zanna & Rempel, 1988).

According to Zanna and Zempel (1988), we form attitudes by evaluating the value or worth of something. The simplest way to do this is by placing them into one of two categories, such as

“good” or “bad”. We can also compare them to other things, saying one is "better than" or "worse than" another. Alternatively, instead of just two categories, we can use a scale and rate something from 1 to 10.

This evaluation is based on three types of information: (1) cognitive information, (2) affective information, and (3) information concerning past behaviors (Zanna & Rempel, 1988). ”Each of these components is highly distinct from the others, and they can all contribute to the formation of people’s attitudes and, consequently, their interactions with the outside world” (Hussin & Abdul Wahid, 2023, p. 580).

Many researchers view this model as a good representation of attitudes because it reflects the main elements that influence how people form evaluations. However, it is important to add that environmental attitudes cannot be measured directly, therefore most of the studies use self-report methods, – such as interviews and questionnaires – which are not completely reliable measures of actual behaviors (Capstick, Whitmarsh, Poortinga, Pidgeon, & Upham, 2015). Surveys often assume that people act individually, which can lead to a limited or distorted idea of what ”the public” really is. Surveys are also subject to methodological limitations, for example how the question is framed (Capstick et al., 2015). Moreover, as with any attitude or opinion measure, reported intentions can be biased (Hayford, 2009). Despite this, the three-component model remains the traditional view of attitude structure (Milfont & Duckitt, 2010). Therefore, this thesis will also rely on it to measure environmental attitudes.

2.2.1. Cognitive Dimension

The first component of the model (cognitive information) includes the knowledge aspect of an attitude, along with personal thoughts and ideas (Cottrell, 2003). This dimension is important because knowledge shapes how individuals perceive and evaluate environmental issues, which then influences their behaviors.

In environmental psychology, knowledge is seen as a tool to overcome psychological barriers like ignorance and misinformation, and it generally allows us to solve certain tasks or problems. Without sufficient knowledge, individuals may struggle to understand the significance of environmental issues or the role they can play in addressing them (Frick, Kaiser, & Wilson, 2004).

According to Frick et al. (2004), environmental knowledge can take three forms: system knowledge, action-related knowledge, and effectiveness knowledge. First, individuals need system knowledge, meaning a basic understanding of ecological principles. Second, they require action-related knowledge, or awareness of possible steps to address environmental problems. Third, they must have effectiveness knowledge, which involves knowing which

actions are most impactful. ”For example, if people know that CO_2 contributes to global warming, they may still not know what actions they can take to reduce their CO_2 emissions” (Frick et al., 2004, p. 1599). This shows that simply having knowledge is not enough, individuals must also understand how to turn that knowledge into meaningful action.

Gifford and Nilsson (2014) argue that ”one is unlikely to knowingly be concerned about the environment or deliberately act in pro-environmental ways if one knows nothing about the problem or potential positive actions” (p. 142). While knowledge alone does not guarantee action, it provides the basis for awareness and informed decision-making, shaping how individuals respond to environmental issues (Gifford & Nilsson, 2014).

2.2.2. Affective Dimension

The second component refers to feelings and beliefs about certain issues (Cottrell, 2003). As Jain (2014) explains, it reflects how people emotionally evaluate an attitude object.

In environmental psychology, this component is closely connected to the concept of environmental concern. Although widely used, environmental concern is not a scientific term but one imported from the political discourse. It is defined as a general attitude that combines cognitive and emotional evaluations of environmental protection (Bamberg, 2003). Dunlap and Jones define it as ”the degree to which people are aware of problems regarding the environment and support efforts to solve them and/or indicate a willingness to contribute personally to their solution” (2002, as cited in Telesiene & Gross, 2016, p. 193). Thus, the affective component plays a central role in shaping environmental concern.

2.2.3. Behavioral Dimension

According to Jain (2014), the behavioral component reflects an individual’s verbal or nonverbal tendency to act, and includes observable responses that result from an attitude object. In other words, it involves a person’s favorable or unfavorable willingness to take action toward that object. In the environmental context, Sawitri, Hadiyanto, and Hadi (2015) define pro-environmental behavior as conscious actions aimed at reducing the negative impact of human activities on the environment or improving its quality.

As stated before, because environmental attitudes are commonly measured through self-reports, there is a high chance of inconsistency between reported and observed behavior (Milfont & Duckitt, 2010). For this reason, Cottrell (2003) uses ”verbal commitment” instead of actual behavior in his model. Verbal commitment represents a stated willingness to engage in environmental protection and is used to measure the behavioral component. This distinction is

important, as some individuals may express environmental concern, but are not willing to take action – this component therefore measures the commitment to act, rather than action itself.

2.3. Linking Environmental Attitudes and Fertility

In recent years, the question of whether environmental attitudes influence childbearing decisions has received increasing attention. As climate change becomes more visible through extreme weather events, ecological crises, and growing public awareness, it is important to understand how these global concerns shape individual reproductive intentions. A growing body of research suggests that environmental concerns – particularly those rooted in sustainability ethics and climate anxiety – may have an impact on fertility decisions.

The link between population growth and environmental pressure is widely discussed, and there is ongoing debate about how strong this relationship is. Many scholars argue that human population growth is one of the primary causes of global climate change, while others point out that people in high-growth regions of the Global South often consume very little, meaning their environmental impact remains relatively low (Wollburg et al., 2023).

Evidence from Gerlagh, Lupi, and Galeotti (2023) suggests that population dynamics still play an important role: between 1970 and 2019, global CO_2 emissions more than doubled, and about 75% of this increase can be attributed to population growth. This indicates that the number of people on the planet has been a major driver of total emissions growth.

Based on this reasoning, some researchers argue that slowing or ending population growth could help reduce future emissions because each additional child contributes to resource use and CO_2 output (Cafaro, 2012; Gerlagh et al., 2023).

But where does the connection between environmental concern and fertility lie? According to Bastianelli (2024), it lies in two broad mechanisms: lifestyle-sustainability considerations and psychological-emotional concerns, each shaped by uncertainty about the future and the perceived consequences of reproduction. These will be discussed in the following.

2.3.1. Mechanisms Linking Environmental Attitudes to Fertility

Lifestyle-Sustainability Mechanism

The first mechanism is linked to sustainable lifestyles, in which individuals incorporate fertility choices into broader strategies to reduce their environmental impact. This idea connects to neo-Malthusian thinking. While Malthus focused on natural limits to population growth and emphasized that positive checks – such as famine, disease, and war – would increase mortality

when resources became scarce, modern neo-Malthusians have expanded the argument to emphasize the ecological consequences of population growth, including resource depletion and greenhouse gas emissions. According to this theory (Martinez-Alier & Masjuan, 2005), unlimited population growth is not possible because the natural environment is limited.

Wynes and Nicholas (2017) calculated the potential to reduce greenhouse gas emissions of a broad range of individual lifestyle choices in developed countries. According to them, the highest impact choices are having one fewer child, living car free, avoiding air travel, and eating a plant-based diet. For the action ”have one fewer child”, they relied on a study which quantified future emissions of future generations based on historical rates (Wynes & Nicholas, 2017). ”Having fewer children, particularly in wealthy consumerist societies, may be part of the solution to many of the problems posed by climate change” (Peters et al. 2023, p. 3).

A study by Helm et al. (2021) finds that 38% of Americans aged 18 to 29 believe that environmental factors should be considered when deciding whether to have children, reflecting how environmental awareness increasingly inform reproductive decision-making.

Several studies have also demonstrated a link between enviornmental concern and voluntary childlessness. While childlessness simply refers to the absence of children, voluntary childlessness is characterized by the lack of motivation to have children. It represents a non-traditional family form in which individuals actively choose not to become parents (Houseknecht, 1987). Voluntary childlessness has become more common in recent years (Skirbekk, 2022), raising questions about why people choose not to have children.

O’Neill and Wexler (2000) add to the discourse by emphasizing that childbearing also brings positive externalities for societies. According to them, additional children can be beneficial because as adults, they increase the future tax base, pay for public pensions, and share the burden of public goods. However, from an environmental standpoint, the long-term ecological footprint of each additional person often outweighs these societal benefits.

Psychological-Emotional Mechanism

The second mechanism through which environmental attitudes may influence fertility involves psychological and emotional responses (such as eco-anxiety, concern, and guilt) associated with the idea of raising children in an environmentally unstable future. This view is represented by Arnocky et al. (2012), who focus on a sense of responsibility and fear about bringing a child into a world seen as endangered.

Schneider-Mayerson and Leong (2020) find that many people express deep concern about the climate-related challenges their existing, future, or potential children might face. As they observe: ”The phenomenon of climate concern contributing to a reluctance to have children

raises the possibility that so many young people in wealthy, high-emissions nations will choose to have smaller families or forego procreation entirely" (Schneider-Mayerson & Leong, 2020, p. 1021).

An analysis of online comments reveals two recurring themes: (1) some view having children in the context of climate change as selfish, and (2) overpopulation is the most commonly cited concern among people (Helm et al., 2021). Saha, Haq, and Ahmed (2023) argue that people's worries about environmental problems are reflected in their fertility intentions, as climate issues are gaining much attention in decision-making processes.

Schneider-Mayerson and Leong (2020) find that their survey respondents were concerned about the carbon footprint of reproduction and the well-being of their offspring. These considerations show the emotional pressures and ethical dilemmas individuals face when considering parenthood. Supporting this, a 2018 public poll in the United States finds that 11% of childless adults aged 20 to 45 who either did not want children (or were unsure) cited "worried about climate change" as one of their reasons (Miller, 2018), reflecting broader anxieties about future environmental conditions.

2.3.2. Changing Environmental Concern Across the Life Course and Over Time

The Life Course Theory (Chapter 2.1.3) suggests that fertility intentions change over the life course, however the approach is also useful for understanding how environmental concerns change over time.

Climate Concern among Younger Generations

Research consistently shows that today´s younger adults express higher levels of worry about environmental issues than older age groups, although this pattern may reflect age, period, or cohort differences. Jylhä et al. (2025) – using datasets from the 2021 Gender and Generation Survey in Sweden – find that while older participants were more concerned about overpopulation, younger cohorts were especially worried about climate change and its impacts on future generations.

But what makes younger generations worry about climate change more? Postmaterialism theory – originally developed by Inglehart (1971, 1977) – suggests that as economic and personal security grow, younger generations tend to shift from materialistic priorities to values like autonomy, self-expression, and environmental concern (as cited in Powdthavee et al., 2024). These postmaterialist values are associated with stronger preferences for environmental protection (Salonen & Åhlberg, 2013; Booth, 2017, 2021) and may even shape

reproductive decisions by encouraging a focus on personal freedom and work-life balance over having larger families (Vitali et al., 2009, as cited in Powdthavee et al., 2024).

Additionally, many young people and climate activists are increasingly vocal about their eco-anxiety, reflecting heightened emotional engagement with environmental threats (Pihkala, 2020).

Worrying after Having Children?

As stated before, fertility is highly sensitive to timing and life events, but so is climate awareness. The effect of environmental attitudes on fertility has been introduced earlier, however, very little is known about whether becoming a parent affects environmental concerns.

Previous studies have suggested that becoming a parent can influence men's and women's environmental concerns in different ways. Mothers might become more environmentally conscious because they are thinking about their children's health, while fathers may shift their focus toward financial responsibilities, which can lead to less concern for the environment. As a result, women are often expected to show more environmental concern after having children (Blocker & Eckberg, 1997; Davidson & Freudenburg, 1996, as cited in Peters et al., 2023).

Peters et al. (2023) were the first to explore the reciprocal relationship between environmental concerns and fertility. Using longitudinal data from the German Socio-Economic Panel, they examined how environmental concern changes over the life course. Their findings show that childless individuals report slightly higher levels of environmental concern at younger ages, but their concern declines more steeply over time. In contrast, parents tend to maintain or even increase their level of concern as they grow older, so that at older ages they express more environmental concern than childless individuals (Peters et al., 2023).

Although the statistical uncertainty was large, the study suggests that becoming a parent might actually increase people's concern for the environment over time. As children grow up, parents might start thinking more seriously about long-term risks, like climate change. This shows that it's not just environmental concerns that influence whether people have children – having children can also change how people think about the environment.

The Role of Media, Politics, and Crises in Shaping Environmental Attitudes

Environmental attitudes are also highly sensitive to external influences, such as media coverage, political context, and crisis events.

Social media plays a major role in shaping people's environmental attitudes by providing a platform to express concerns about climate change, call for action, and share images from protest events (Boulianne et al., 2020). One of the most prominent examples of this influence

is the global reach of Greta Thunberg's climate movement. At the age of 15, Greta began striking from school every Friday to protest world leaders' inaction on the climate crisis and to advocate for urgent climate action (Srivastava, Mishra, Singh, & Ramkissoon, 2024). Friday's For Future, which began in 2018, has since become one of the most recognizable and visible global climate movements. A 2019 analysis of online tweets by Boulianne et al. (2020) finds that the discourse gained widespread attention through the use of multiple hashtags, with many tweets including #FridaysForFuture and #SchoolStrike4Climate.

Konisky, Hughes, and Kaylor (2016) show that there is a positive relationship between experiencing extreme weather activity and expressions of concern about climate change. Their analysis highlights clear demographic and political patterns. Younger people, women, those with higher education, unmarried individuals, and people who attend church less frequently tend to express greater concern about climate change. Political affiliation is also important: Democrats report substantially higher levels of climate concern than Republicans.

An analysis by McCright and Dunlap (2011) further supports the role of political ideology, showing that conservative white males in the United States are significantly more likely to deny climate change, particularly those who believe they understand global warming very well.

A study by Brulle, Carmichael, and Jenkins (2012) finds that economic conditions strongly influence public opinion on climate change: increases in unemployment and reductions in income both reduce public concern for the environment.

The COVID-19 pandemic also had a notable impact on environmental attitudes worldwide. Guo et al. (2024) examine the effects of the pandemic on environmental behaviors and attitudes, finding that while COVID-19 negatively affected engagement in environmental activities, it had a positive effect on environmental attitudes among younger individuals.

2.3.3. Empirical Evidence and Gaps

In recent years, growing attention to environmental issues has led researchers to examine whether environmental attitudes are linked to fertility decisions. However, existing research shows that the relationship remains unclear.

Importantly, evidence from different national contexts must be interpreted carefully because social, economic, and environmental conditions vary widely across countries, especially between high-income and lower-income settings. For example, two studies using data from the Chitwan Valley Family Study in Nepal reached contrasting conclusions about the relationship between environmental conditions and contraceptive use.

Ghimire and Mohai (2005) find that those individuals who perceive a decline in their environment (specifically in agricultural productivity) are more likely to use contraceptives compared to those who believe their environment has either improved or remained stable. In contrast, Brauner-Otto (2014), analyzing the same study population, finds the opposite: women living in poor environmental conditions are less likely to use contraception to terminate their fertility, possibly as a way to cope with the challenges brought on by those conditions.

According to Helm et al. (2021, p. 111), ”a focus on developed countries is important because consumption levels and contribution to greenhouse gas emissions is disproportionately higher”. In these settings, fertility decisions often occur within highly individualized life contexts that include considerations such as career planning, access to family planning services, and lifestyle preferences. Some studies also suggest that ethical concerns (such as climate change) can become part of these decision-making processes (DeRose & Stone, 2021), although the extent and mechanisms of this influence remain debated.

Yet even within developed countries, the evidence is mixed. Gordon (2021), using an online survey in the UK, examined how extrinsic risks (external factors that pose a risk to an individual’s life, e.g., COVID-19) and existential risks (risks with outcomes that threaten the existence of humans as a species, e.g., climate change) relate to reproductive decision-making. The study finds that knowing someone who had been hospitalized with or died from COVID-19 is associated with a higher ideal number of children. Conversely, there is no clear evidence of a relationship between climate change beliefs and reproductive decision-making.

Similarly, Szczuka (2022), using Eurobarometer data from 2011, finds inconsistent associations between climate change concerns and the ideal number of children in the Visegrád countries (Hungary, Czech Republic, Poland, and Slovakia). In Hungary, higher concern about climate change is linked to preferring smaller families only in a general perspective, not on a personal level. In the Czech Republic, climate concern is associated with wanting fewer children personally. In Slovakia, stronger climate-related concern is connected to both smaller general and personal ideal family sizes.

Other studies have find little or no significant connection between environmental concern and fertility preferences. De Rose and Testa (2015), using a European sample, report no meaningful relationship between individuals' climate change concerns and their intended number of children. Similarly, Jylhä, Kolk, and Fairbrother (2024) find little evidence that environmental concerns have a notable connection with fertility outcomes in Sweden.

Nevertheless, a number of studies suggest that strong environmental concern can be linked to reduced fertility intentions. For example, Arnocky et al. (2012) examining young Canadian university students, find that higher environmental concern is associated with a less positive

attitude toward reproduction. In another study, Golovina and Jokela (2024) analyze data from the German Socio-Economic Panel Study and find that social and environmental worries are associated with a decreased likelihood of having children. Similarly, Powdthavee et al. (2024), using a large UK sample of initially childless individuals, find that people who are not concerned about environmental issues are approximately 50% more likely to have a child than those who expressed deep concern. Bastianelli (2024) also finds evidence of this pattern in Finland, Estonia, and Sweden, where strong climate change concern is linked to lower fertility intentions.

While earlier studies have examined the link between environmental attitudes and fertility, important gaps remain. Many focus on individual countries or use older datasets, which makes it difficult to understand how this relationship may vary across contexts. Very little is known about whether climate worry is associated with actual childbearing outcomes across Europe, or whether this relationship varies across different welfare systems.

This thesis contributes to filling these gaps by using the most recent waves of the European Social Survey (8, 10, and 11), which have not previously been used to examine the association between climate worry and fertility behavior. The inclusion of 19 European countries enables meaningful cross-national comparisons. By grouping countries into welfare regime types, the study also examines whether institutional contexts – such as family policies and social support systems – moderate the relationship between climate worry and fertility, which has rarely been explored in previous research. Additionally, this thesis investigates whether climate worry is more strongly linked to fertility behavior during the key reproductive years, providing new insight into how the timing of attitudes may influence reproductive decisions.

3. ENVIRONMENTAL ATTITUDES, FERTILITY TRENDS, AND POLICY CONTEXTS

Before turning to the empirical analysis of this thesis, this chapter provides an overview of global and European environmental attitudes and fertility trends. It also offers a brief introduction to relevant environmental and family policies that may influence both environmental awareness and reproductive behavior, in order to place the study's findings in a broader social and institutional context.

3.1. Global Environmental Attitudes

Capstick et al. (2015) identify four broad time periods in the evolution of public environmental concern: (1) 1980s to early 1990s: a period characterized by rising public awareness and increasing knowledge about environmental issues, (2) mid-1990s to mid-2000s: public concern continued to grow, though attitudes became more variable across countries and over time, (3) mid- to late-2000s: a phase marked by declining concern in several nations, accompanied by greater skepticism and increasing polarization, and (4) 2010s: a period showing signs of stabilization in public concern about climate change.

But how do public environmental attitudes look globally today? A 2019 survey conducted by the National Geographic Society in 11 countries (Australia, Brazil, China, Indonesia, Kenya, Mexico, South Africa, South Korea, United Arab Emirates, United Kingdom, and the United States) provides insight into how people view environmental issues across different cultural, economic, and environmental contexts (Miller, Rice, Gustafson, & Goldberg, 2022). They find that participants from Mexico report the highest levels of pro-environmental attitudes, followed by Brazil, the United Kingdom, South Africa, and Indonesia. In contrast, the United States, South Korea, and Australia show the lowest levels.

A more recent survey by the Pew Research Center (2025) of perceived global threats reveales that, overall, a majority in most surveyed nations view climate change as a major threat to their country, with the 25-country median standing at 67%. The countries most concerned include Argentina (80%), France (78%), Japan (78%), Brazil (77%), South Korea (77%), Greece (75%), Mexico (74%), Hungary (72%), Spain (72%), Italy (71%), and Turkey (70%). In comparison, Israel reports the lowest perceived threat, with only 42% identifying climate change as a major threat, followed by the United States (51%), Nigeria (54%), Poland (55%), India (55%), and South Africa (57%) (Poushter, Fagan, Smerkovich, & Prozorovsky, 2025).

Together, these findings highlight that although concern for climate change and environmental issues is widespread, significant differences remain across countries, shaped not only by cultural, political, and economic contexts but also by the presence of other pressing threats, such as war or conflict.

3.1.1. Environmental Attitudes in Europe

As the earlier Pew Research data shows, many Europeans view climate change as a serious threat. Yet, environmental concern is not uniform across the continent. Telesiene and Gross (2016) note that European environmentalism is difficult to compare because environmental sociology has developed very differently across regions.

Since the 1970s, countries such as the UK, the Netherlands, Scandinavia, and German-speaking regions have focused on how environmental changes influence lifestyles and consumption. In contrast, environmental sociology in Central and Eastern Europe was suppressed under socialist regimes and only began to re-emerge in the late 1980s (Telesiene & Gross, 2016).

Recent research indicates that many European countries are considered to be ”green”, or to have a high level of environmental awareness nowadays. Telešienė and Gross (2016) argue that the European Union is often viewed as being particularly effective in developing shared approaches to issues such as recycling, energy use, and climate change.

The latest Eurobarometer survey, conducted in 2025, examines Europeans´ attitudes toward climate change. It reveales that in four countries, a majority of respondents view climate change as the most serious problem facing the world today: Sweden (77%), Denmark (73%), Netherlands (65%), and Malta (49%). In five countries, climate change ranks as the second most serious concern: Finland (59%), Ireland (53%), Germany (51%), Belgium (49%), and Lithania (42%). The countries where the fewest respondents identify climate change as one of the most serious global problems are Estonia (28%), Czechia (30%), Latvia (30%), and Romania (30%). Importantly, those who view climate change as a serious problem are significantly more likely to report having taken personal action (63%) compared to those who do not (35%) (European Commission, Directorate-General for Climate Action, 2025).

According to do Paço et al. (2013, as cited in Cantillo, Astorino, & Tsana, 2025), economic, social, and cultural disparities between countries likely help explain differences in environmental attitudes. This indicates that although many people across Europe care about the environment, the level of urgency and willingness to act still differs between countries.

3.1.2. Environmental Policies in Europe

According to Cantillo et al. (2025), stronger environmental policies could play a crucial role in increasing pro-environmental behavior among citizens. As Schwerdtle et al. (2023) point out, the EU27 countries have collectively contributed around 18% of global CO_2 emissions since the industrial revolution. This raises an important question: Where does the Europe currently stand in terms of environmental policy?

Over the past few decades, the EU's environmental policy has evolved considerably, positioning the Union as a global leader in international environmental politics. (Kelemen, 2010) In 2018 alone, the member states spent 297 billion Euros (1.9% of GDP) on environmental protection (Otto & Gugushvili, 2020).

In the 2010s, the EU strengthened its global climate leadership by helping to negotiate the 2015 Paris Agreement, which aims to reduce greenhouse gas emissions and limit global warming to well below 2°C (Erickson & Brase, 2019). In 2019, the EU launched the European Green Deal, an ambitious plan for climate neutrality by 2050 and a transition to a modern, resource-efficient economy (European Commission, n.d.). As Schwerdtle et al. (2023) note, this requires unprecedented cooperation among EU member states and represents one of the most far-reaching socio-economic transformations in history.

Across Europe, climate policies differ widely. Sweden is often viewed as a frontrunner, with an early carbon tax and strong public support for environmental action, ranking highest in pro-environmental attitudes and behavior (Cantillo et al., 2025). In Finland and many Western European countries, high levels of pro-environmental behavior exist despite lower concern – likely driven by effective policy design (Cantillo et al., 2025). The UK pioneered national climate legislation with the 2008 Climate Change Act (UK Parliament, 2008), and Germany's Energiewende aims to expand renewable energy (Agora Energiewende, n.d.).

In contrast, Eastern and Southern European countries show lower levels of environmental behavior, despite having climate policies in place (Cantillo et al., 2025). Poland's PEP2040 aims to reduce emissions while maintaining domestic energy resources (Ministry of Climate and Environment, n.d.), and Czechia plans a 30% emissions reduction by 2030 with a stronger focus on renewables (Ministry of Industry and Trade of the Czech Republic, 2019). In Southern Europe, Spain stands out as a renewable energy leader aiming for climate neutrality by 2050 (European Commission, n.d.). Overall, European countries pursue diverse policy pathways, which can shape pro-environmental behavior in different ways.

3.2. Global Fertility

Unlike attitudes, fertility levels can be measured using objective indicators such as the total fertility rate (TFR) or birth rate. Before the start of the demographic transition, fertility rates were high across the world, with families typically having many children to compensate for high mortality rates. This pattern began to shift in Europe during the late 18th century, where both birth and death rates gradually declined. This transformation, known as the demographic transition, eventually became a global process (Reher, 2004).

As Aitken (2024) explains, socioeconomic development is closely linked to demographic transitions, which typically begin with declining infant mortality and are followed by reductions in fertility. However, the pace and pattern of this transition can look different around the world because each society and culture responds to growing prosperity in its own way.

Today, according to the United Nations, around two-thirds of the global population live in countries with fertility rates below replacement levels. Even in regions where fertility remains high – such as sub-Saharan Africa – the trend is still downward (Aitken, 2024). Fertility in North Africa and the Middle East remains the second highest globally, still above the replacement level of 2.1. However, in every other world region, fertility has fallen below this threshold (Bhattacharjee et al., 2024).

3.2.1. Fertility Levels in Europe

Fertility levels across Europe are all below the replacement level of 2.1. According to the latest 2023 Eurostat fertility data (Eurostat, 2023), Bulgaria had the highest TFR (1.81) of all the European countries. It was followed by Montenegro (1.76), Georgia (1.71), France (1.66), Moldova (1.62), Serbia (1.62), Hungary (1.55), and Iceland (1.55). On the other end, the countries with the lowest levels were Malta (1.06), Spain (1.12), Lithuania (1.18), Poland (1.20), Italy (1.21), Luxembourg (1.25), Finland (1.26), and Greece (1.26).

While some broad regional patterns can be observed – with several Eastern and Southeastern European countries reporting higher fertility rates – there are clear exceptions. For instance, France maintains one of the highest TFRs, while Poland ranks among the lowest. However, these period-based indicators must be interpreted with caution, as they can be affected by tempo effects. When women delay having children, the timing shift can temporarily lower the period TFR even if their overall number of children does not change. Bongaarts and Sobotka (2012) show that this has happened in many European countries, where rising ages at childbirth distorted period TFRs downward and were later followed by a catch-up in births at

older ages. Taking these timing effects into account helps show that national fertility levels depend not only on geography but also on social, economic, policy, and demographic factors.

3.2.2. Family Policies and Welfare Regimes in Europe

Badolato et al. (2024) argue that the link between parental socioeconomic status, fertility norms, ideals, and behavior varies across societal contexts. According to them (Badolato et al., 2024), institutions that foster economic and emotional independence and reduce structural barriers allow young people to make independent decisions about family formation. This implies that fertility levels are highly sensitive to national contexts and policies – such as supportive family policies, high gender equality, and stable economic opportunities for young people entering the labor market.

As Badolato et al. (2024) explain:

> Family policies aim to compensate the direct costs of childrearing, support early childhood development, reduce child poverty, foster employment, and improve gender equity (Gauthier, 2007; Thévenon, 2011). In response to low-fertility levels, most European countries have implemented family policies (Harknett et al., 2014) (p. 7).

A common approach to examining national contexts and institutional arrangements is to analyse welfare regimes as packages of specific policy combinations (Matysiak & Vignoli, 2008). From a broader perspective, welfare states frame their key questions within the political economy, addressing issues related to employment, wages, and social protection (Esping-Andersen, 1990). The most widely used welfare typology, developed by Esping-Andersen (1990), distinguishes three regime types: Liberal, Conservative, and Social-democratic.

Liberal regimes involve limited state intervention emphasise individual responsibility, therefore individuals rely on labor market participation to support their families (Matysiak & Vignoli, 2008). For instance, in the United Kingdom, childcare support is primarily targeted at low-income families or those meeting specific employment criteria (Rakar et al., 2022).

Conservative regimes are typically characterised by traditional family values and a male breadwinner model, often resulting in policy designs that discourage women's labor market participation (Esping-Andersen, 1990). In Austria, policy efforts to promote gender equality remain limited, and fathers take much less parental leave compared to fathers in other European countries (Gönenç et al., 2015). In Germany, the unification has created a hybrid system that combines the male breadwinner model of former West Germany with the dual-earner model that was common in former East Germany (Bergsvik, Fauske, & Hart, 2021).

Social-democratic regimes (often portrayed as a model of balanced full) offer a progressive set of social services for working parents and support full-time employment for both men and women (Esping-Andersen, 1990). A perfect example is Norway, who has one of the highest levels of childcare coverage in the European Union (Rakar et al., 2022).

However, not all countries fit strictly into one of these three categories, especially in Europe, where social, economic, and historical contexts vary widely.

France illustrates a hybrid model by combining conservative elements (such as universal family allowances and strong recognition of the family as a social unit) with liberal features like extensive childcare provisions that promote dual-earner households (CLEISS, 2025). Similarly, the Netherlands spends less on family policies than the EU average (Yanatma, 2025), yet provides a universal child benefit for all children under 18 and additional income-related support aimed at low-income families (Government of the Netherlands, 2025).

In contrast, Southern European countries tend to be characterized by weaker institutional support for families, where care provision within the extended family remains the norm (Matysiak & Vignoli, 2008). Spain does not have a universal child benefit and relies primarily on tax reliefs for family support (Hernández, Cantó, & Picos, 2025), while Italy has recently moved toward stronger support with the introduction of the General Family Allowance in 2022, designed to reduce poverty and address persistently low fertility levels (Dalla-Zuanna & McDonald, 2023).

In Post-communist contexts, such as Poland and Hungary, family policies are often linked to pronatalist goals and used to promote conservative family and gender norms. Hungary, for example, offers generous cash benefits to families with several children, encouraging and rewarding larger families (Gauthier & Gietel-Basten, 2025). Slovenia takes a more balanced approach – its cash benefits are framed as social transfers for those most in need, but they still reflect elements of both conservative and social-democratic regimes (Rakar et al., 2022).

Overall, these variations show that welfare regimes differ widely in the extent and design of family policy support, which can strongly influence fertility behavior and the conditions under which individuals make family formation decisions.

4. RESEARCH QUESTIONS AND HYPOTHESES

The present study examines the relationship between environmental attitudes and fertility behavior in Europe. Specifically, it investigates whether climate worry is associated with both the transition to parenthood and variation in family size, and whether these associations differ across demographic, socioeconomic, and institutional contexts, particularly across welfare regime types. The main research question guiding this thesis is: *To what extent are environmental attitudes – specifically levels of climate worry – associated with fertility behavior in Europe?* To address this overarching question, the analysis is structured around the following sub-questions:

- **RQ1:** *Is climate worry associated with the likelihood of (a) having ever had children and with (b) the number of children individuals have?*
- **RQ2:** *Does the association between climate worry and fertility behavior differ across sociodemographic groups, particularly across life-course stages?*
- **RQ3:** *Does the association between climate worry and fertility behavior differ across European welfare regime types?*

Given that Europeans generally perceive environmental problems as serious threats (European Commission, Directorate-General for Climate Action, 2025), fertility levels across Europe remain well below replacement level (Eurostat, 2023), and most European welfare states have strong family policies that could interact with how people weigh climate concerns against childbearing (especially during the main childbearing ages), it is reasonable to expect a negative relationship between environmental attitudes and fertility behavior. Based on this reasoning, the thesis tests the following hypotheses:

- **H1:** Higher levels of climate worry are associated with a lower likelihood of having ever had children.
- **H2:** Higher levels of climate worry are associated with a lower likelihood of having multiple children (compared to having no children).
- **H3:** The association between climate worry and fertility behavior is strongest during the main reproductive years (25-34).
- **H4:** In welfare regimes that provide strong family support, the association between climate worry and lower fertility is expected to be weaker, as supportive institutions may reduce perceived risks related to childbearing.

Together, these questions and hypotheses form the analytical framework of the study and provide the foundation for the data and methods discussed in the next chapter.

5. DATA AND METHODOLOGY

5.1. The European Social Survey

The data used in this research come from the European Social Survey (ESS), a cross-sectional survey that began in 2002 and is conducted every two years in European countries through face-to-face interviews. The ESS aims to measure and explain how social values, cultural norms and behavior patterns are distributed and how they vary both within and between nations (European Social Survey, 2023).

Participating countries are required to achieve a minium effective sample size of 1,500, or 800 in countries with a population smaller than 2 million. Individuals aged 15 and over (with no upper age limit) are selected by strict random probability sampling at every stage.

The survey is initially developed in British English and then translated into national languages by each country´s ESS team. The questionnaire consists of two components: a core module and a rotating module. The core module, which remains constant from round to round, measures (1) people's value and ideological orientations, (2) cultural and national orientations, and (3) the underlying social structure of society. The rotating module changes with each round and focuses on specific academic or policy-relevant topics (European Social Survey, 2023).

The topic of climate change was introduced in Round 8 (2016) as part of a rotating module called "Public Attitudes to Climate Change, Energy Security, and Energy Preferences". This module enables detailed cross-national comparisons of how people understand and evaluate these issues, helping to clarify how environmental attitudes vary across different social and political contexts (European Social Survey, 2026).

This thesis uses data from Rounds 8 (2016), 10 (2020), and 11 (2023) of the ESS. Round 9 (2018) had to be excluded because it did not include the climate change module.

5.2. Measures

5.2.1. Dependent Variables (Fertility Behavior)

Ever Had Children

The first variable used to assess respondents' fertility behavior is taken from the survey item on whether the respondent ever had children (*"chldhhe"*). The precise wording of the survey question was: *"Have you ever had any children of your own, step-children, adopted children, foster children, or a partner's children living in your household?"* Responses were coded as 1

= Yes and 2 = No. All other responses (not applicable, refusal, don't know, no answer) were treated as missing values.

Number of Children

The second variable used to measure fertility behavior is the number of children (*numberofchildren*). This variable was derived from multiple items in the ESS dataset, specifically from variables indicating the relationship between the respondent and up to seven other household members (*"rshipa2"* to *"rshipa7"*). In these items, respondents were asked: *"Looking at this card, what relationship is he/she to you?"* A response coded as 2 indicated a son, daughter, stepchild, adopted child, or foster child.

To calculate the number of children, each relationship variable was examined for values coded as 2. A new variable was then generated to count how many household members were identified as children. This made it possible to create a variable for each respondent showing how many children live in their household.

The number of children in the sample ranged from 0 to 6. Childlessness was the most common outcome, followed by having one or two children. Respondents with more than three children were relatively rare, therefore, these cases were merged into a single category. The final coding for the *numberofchildren* variable includes four categories: 0, 1, 2, and 3+.

5.2.2. Independent Variables (Environmental Attitudes)

Climate Belief

To measure the cognitive component of environmental attitudes, the variable *"ccnthum"* was used and renamed to *climatebelief*. This variable was selected because it captures individuals' *"*system knowledge" of climate change – specifically, their understanding of its causes. As described in Chapter 2.2.1, system knowledge refers to a basic understanding of ecological principles and environmental processes (Frick et al., 2004). Respondents´ knowledge about climate change was assessed with the question *"Do you think that climate change is caused by natural processes, human activity, or both?"* with the response options of 1 (entirely by natural processes), 2 (mainly by natural processes), 3 (about equally by natural processes and human activity), 4 (mainly by human activity), and 5 (entirely by human activity). All other invalid or incomplete responses were treated as missing values. Based on the responses, a new three-level categorical variable was constructed to reflect climate change beliefs: Natural (responses 1 and 2), Indifferent (response 3), Human (responses 4 and 5).

Climate Worry

For the affective component, the variable *"wrclmch"* was used and renamed to *climateworry*. In the questionnaire, the respondents were asked how worried they are about climate change with the following response options: 1 (not at all worried), 2 (not very worried), 3 (somewhat worried), 4 (very worried), and 5 (extremely worried). Again, all other invalid or incomplete responses were treated as missing values. Based on the answers, a three-level categrical variable was created: Low (responses 1 and 2), Neutral (response 3), High (responses 4 and 5).

Climate Responsibility

To measure the behavioral component, the variable *"ccrdprs"* was selected and renamed to *responsibilitytoreduce*. This was assesed with the question: *"To what extent do you feel a personal responsibility to try to reduce climate change?"* using a scale from 0 (not at all) to 10 (a great deal). All invalid or incomplete responses were treated as missing values. The responses were recoded into a four-level categorical variable: None (response 0), Low (respones 1 to 4), Moderate (responses 5 to 9), High (response 10).

Although having a strong sense of responsibility does not necessarily mean that an individual will act accordingly, this variable provides the closest available measure of the behavioral component in the ESS survey questionnaire.

5.2.3. Control Variables (Demographic and Socioeconomic Variables)

In order to account for potential influencing factors, several control variables were included in the analysis. These variables were selected to reflect key demographic, socioeconomic, and political dimensions known to influence both fertility behavior and environmental attitudes:

- **Survey round** *(round):* Indicates the ESS wave (Rounds 8, 10, and 11) to control for variation across survey years.
- **Country** *(country):* Since the number of participating countries varies across survey rounds, only those countries that participated in all three relevant rounds were included in the analysis. The final sample consists of the following 19 countries: Austria, Belgium, Czechia, Germany, Spain, Finland, France, United Kingdom, Hungary, Iceland, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Sweden, and Slovenia.
- **Welfare model** *(welfaremodel)*: The variable categorizes countries based on their welfare state typology. The initial classification followed Neyer´s (2013) categories: Social-democratic (Sweden, Norway, Finland, Iceland), Conservative (Austria, Belgium, France,

Germany), Liberal (Ireland, Netherlands, United Kingdom), Southern (Spain, Italy, Portugal), and Post-communist (Czechia, Hungary, Poland, Lithuania, Slovenia).

However, this typology did not align well with the goals of this thesis for two reasons: (1) some countries were outliers in their assigned category – for example France and Belgium differed significantly from the German-speaking counties, and (2) this categorization led to non-significant results in the emprical analysis.

To address this, one additional category was added, leading to the final typology used in this thesis:

  - Social-democratic: Sweden, Norway, Finland, Iceland
  - Conservative: Austria, Germany
  - Hybrid continental: Belgium, France, Netherlands
  - Liberal: Ireland, United Kingdom
  - Southern: Spain, Italy, Portugal
  - Post-communist: Czechia, Hungary, Poland, Lithuania, Slovenia

- **Gender** *(gender):* Coded as Male or Female.
- **Age group** *(age_group):* This variable was computed from the continuous age variable, restricted to typical childbearing ages and grouped into three categories based on reproductive life stages: 15-24 (early fertility age), 25-34 (common fertility age), 35-49 (late fertility age).
- **Education level** *(educationlevel):* Recoded from the *"eisced"* variable as follows: Low (less than lower secondary, lower secondary), Medium (lower tier upper secondary, upper tier upper secondary, advanced vocational sub-degree), High (BA level, MA level).
- **Political orientation** *(politicalorientation)*: Derived from the ESS variable *"lrscale"*, where respondents were asked: *"In politics people sometimes talk of 'left' and 'right'. Using this card, where would you place yourself on this scale, where 0 means the left and 10 means the right?"* Recoded into: Left (0-4), Center (5), Right (6-10).
- **Self-rated health** *(health):* Based on the question: *"How is your health in general? Would you say it is very good (1), good (2), fair (3), bad (4), or very bad (5)?"* Recoded as: Good (1-2), Fair (3), Poor (4-5).
- **Marital status** *(maritalstatus)**:*** Based on the *"marsts"* variable, including the following categories: Legally married, In a legally registered civil union, Legally separated, Legally divorced/Civil union dissolved, Widowed/Civil partner died, None of these.
- **Religious affiliation** *(religion)*: Measured by the variable *"rlgblg"*, which asked: *"Do you consider yourself as belonging to any particular religion or denomination?"* Recoded as: Yes or No.

- **Net household income** *(netincome)*: Based on the *"hinctnta"* variable, which places respondents into national income deciles ranging from 1 (lowest) to 10 (highest).

Missing values were excluded for all variables with the exception of *maritalstatus*, *religion*, and *netincome,* which had a particularly high number of missing cases. Including them as control variables in the main analysis would have reduced the sample size too much. Therefore, they were left out of the main models but added later in the robustness checks, which use a smaller subsample.

5.3. Methods

This thesis aims to explore the associations between environmental attitudes and fertility behavior across Europe. To address this question, the analysis is divided into two main parts: a descriptive analysis and a regression analysis. Data preparation, statistical analyses, and visualization were all carried using the R programming language. Unless stated otherwise, all figures and tables in this work have been produced by the author of this thesis and are based on ESS data.

As the first step of the analysis, survey weights were applied to the dataset. These weights adjust for different probabilities of being selected in each country, as well as for nonresponse and noncoverage. They also correct for sampling error and account for differences in country population sizes (European Social Survey, n.d.).

The descriptive analysis begins with a description of the sample, followed by an examination of the three variables that measure the cognitive, affective, and behavioral components of environmental attitudes, repsectively. Next, a bivariate analysis was conducted to explore the relationships between environmental and fertility variables at the descriptive level.

This was followed by a trivariate descriptive analysis of the climate variables, assessing the correlations among the three climate-related measures to ensure they did not represent the same underlying concept. To confirm this, two chi-square tests were performed to assess whether the climate variables were interdependent. In the next step, highly correlated variables were excluded from the analysis, leaving *climateworry* as the main variable of interest.

Next, a logistic regression analysis was conducted with *everhadchildren* as the dependent variable and *climateworry* as the independent variable. Logistic regression was used because the dependent variable *everhadchildren* is binary (Yes/No), making this method suitable for

examining how climate worry relates to the likelihood of having children. The results of the logistic regression are presented in the baseline model (Model 1).

Model 2 includes additional control variables (*politicalorientation* and *welfaremodel*), to provide a clearer assessment of how climate worry interacts with these characteristics in shaping fertility behavior. Here, the results are disaggregated by age groups (15-24, 25-34, 35-49). By running separate logistic regressions for the each group, the analysis explores whether the relationship between climate worry and fertility outcomes differs across stages of the life course.

Model 3 introduces interaction terms step by step: first *climateworry* × *gender*, then *climateworry* × *age_group*, then *climateworry* × *welfaremodel*, and finally *politicalorientation* × *welfaremodel*. By adding the interactions stepwise, it becomes possible to see how the odds of having children change and whether the effect of climate worry stays the same or differs across social and contextual groups.

Next, a multinomial regression analysis was performed using *numberofchildren* as the dependent variable and again, *climateworry* as the independent variable. Multinomial regression was chosen because the dependent variable (fertility quantum) has more than two categories, making this method suitable for comparing how different levels of climate worry relate to the likelihood of having no children, one child, two children or three or more children. Model 4 presents the baseline results of this analysis, and a marginal effects graph (Figure 8) further illustrates these relationships.

Finally, Model 5 shows the multinomial regression results by age group and *numberofchildren* outcome using the same control variables as in Model 2. By estimating separate multinomial regressions for the 15-24, 25-34, and 35-49 age groups, the analysis allows comparison of how worry about climate change relates to the likelihood of having one, two, or three or more children at different stages of the life course. In addition, a marginal effects plot (Figure 9) was created for the age group 25-34, which represents the main childbearing group and the most influential cohort for fertility behavior.

In logistic and multinomial logistic regression, the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) provide a more reliable basis for model comparison than R^2 values, as they directly assess model fit while accounting for model complexity. AIC and BIC are used to compare how well different models fit the data while avoiding unnecessary complexity. Lower values indicate a better balance between accuracy and simplicity (Ding, Tarokh, & Yang, 2018). In this study, these criteria were used to see whether adding more variables or interactions improved the model's performance or just made it more complicated.

Based on AIC/BIC comparisons, the variable *health* was excluded from the main models because it did not contribute to improved model fit. For the same reason, an interaction effects model was not estimated for the multinomial regression.

To ensure the robustness of the results, additional analyses were conducted (Model 6, Model 7.1-7.6). First, the models were re-estimated using only respondents with non-missing values on all variables to ensure that missing data did not bias the results. Second, extra control variables were added step by step to assess whether the main relationship between climate worry and fertility outcomes remained stable when accounting for further sociodemographic and contextual factors.

6. RESULTS

6.1. Descriptive Analysis

6.1.1. Description of the Samlpe

The original ESS dataset for the three selected rounds included 106,980 respondents from 32 European countries, representing diverse social and demographic backgrounds. After excluding the countries that did not participate in all three selected waves, respondents who refused to answer key questions, and limiting the sample to individuals of childbearing age (15-49 years), the final sample consisted of 42,480 observations from 19 countries.

Among the study participants, the average age at the survey time was 32.86 with a standard error (SE) of 0.10 years. Approximately 26% of the sample were in the early fertility age group (15-24 years), 27% in the common fertility age group (25-34 years), and 46% in the late fertility age group (35-49 years).

With regard to environmental attitudes, most respondents reported neutral climate worry (44%), believed that climate change is caused by human activities (59%), and felt a moderate level of personal responsibility (74%) to help reduce climate change (Table 1).

Across the full sample, 49.1% were female and 46% reported having had children. Regarding the number of children living in the household, 58% reported none, 15% had one, 20% had two, and only 6.8% reported three or more. However, patterns varied by welfare regime. In Post-communist countries, a slight majority (51%) reported having children, making them the only group where this is the case. In contrast, Southern countries had the highest proportion of respondents without children (58%), while Social-democratic countries reported the largest share of respondents (9.8%) living with more than three children.

In terms of educational attainment, the majority of individuals had medium education levels, with only 31% holding a BA or MA degree. This trend held across most welfare regimes, with one exception. The Liberal was the only welfare regime where a higher proportion of respondents were highly educated (43%) than medium (38%) or low (19%).

Regarding political orientation, 39% of respondents identified as left-leaning, while 28% identified as right-leaning. However, in Social-democratic and Post-communist countries, a right majority could be observed.

Variable	Overall	Conservative	Social-democratic	Hybrid-continental	Liberal	Southern	Post-communist
Mean Age	33	32	32	32	32	34	33
Age Group							
15–24	13,839 (26%)	3,170 (29%)	779 (29%)	2,973 (28%)	2,693 (27%)	2,755 (23%)	1,469 (23%)
25–34	14,378 (27%)	2,736 (25%)	781 (29%)	2,921 (27%)	3,079 (31%)	3,019 (25%)	1,842 (29%)
35–49	24,191 (46%)	4,975 (46%)	1,158 (43%)	4,834 (45%)	4,124 (42%)	6,110 (51%)	2,990 (47%)
Gender							
Male	26,651 (51%)	5,543 (51%)	1,405 (52%)	5,352 (50%)	5,185 (52%)	5,947 (50%)	3,220 (51%)
Female	25,757 (49%)	5,338 (49%)	1,313 (48%)	5,377 (50%)	4,712 (48%)	5,937 (50%)	3,080 (49%)
Climate Worry							
Low	8,451 (16%)	1,609 (15%)	627 (23%)	1,834 (17%)	1,836 (19%)	1,298 (11%)	1,247 (20%)
Neutral	22,816 (44%)	4,136 (38%)	1,238 (46%)	5,013 (47%)	4,286 (43%)	4,930 (41%)	3,214 (51%)
High	21,141 (40%)	5,136 (47%)	853 (31%)	3,882 (36%)	3,774 (38%)	5,656 (48%)	1,839 (29%)
Climate Change Belief							
Natural	2,912 (5.6%)	649 (6.0%)	187 (6.9%)	487 (4.5%)	523 (5.3%)	556 (4.7%)	509 (8.1%)
Indifferent	18,825 (36%)	3,386 (31%)	794 (29%)	3,730 (35%)	4,137 (42%)	3,966 (33%)	2,811 (45%)
Human	30,671 (59%)	6,845 (63%)	1,737 (64%)	6,512 (61%)	5,236 (53%)	7,362 (62%)	2,979 (47%)
Responsibility to Reduce Climate Change							
None	1,318 (2.5%)	322 (3.0%)	49 (1.8%)	181 (1.7%)	212 (2.1%)	346 (2.9%)	208 (3.3%)
Low	7,037 (13%)	1,534 (14%)	375 (14%)	999 (9.3%)	1,324 (13%)	1,768 (15%)	1,038 (16%)
Moderate	38,632 (74%)	8,050 (74%)	2,070 (76%)	8,128 (76%)	7,386 (75%)	8,469 (71%)	4,529 (72%)
High	5,420 (10%)	974 (9.0%)	224 (8.2%)	1,421 (13%)	975 (9.8%)	1,301 (11%)	525 (8.3%)
Ever had Children							
Yes	24,124 (46%)	4,829 (44%)	1,266 (47%)	5,332 (50%)	4,536 (46%)	4,958 (42%)	3,203 (51%)
No	28,283 (54%)	6,051 (56%)	1,452 (53%)	5,397 (50%)	5,361 (54%)	6,926 (58%)	3,097 (49%)
Number of Children							
0	30,429 (58%)	6,558 (60%)	1,558 (57%)	5,777 (54%)	5,848 (59%)	7,297 (61%)	3,390 (54%)
1	8,101 (15%)	1,571 (14%)	339 (12%)	1,510 (14%)	1,427 (14%)	2,053 (17%)	1,201 (19%)
2	10,290 (20%)	2,060 (19%)	555 (20%)	2,541 (24%)	1,775 (18%)	2,055 (17%)	1,302 (21%)
3+	3,588 (6.8%)	691 (6.4%)	266 (9.8%)	900 (8.4%)	846 (8.5%)	479 (4.0%)	406 (6.4%)
Education Level							
Low	12,085 (23%)	2,570 (24%)	575 (21%)	1,996 (19%)	1,928 (19%)	3,734 (31%)	1,282 (20%)
Medium	23,993 (46%)	5,880 (54%)	1,205 (44%)	5,515 (51%)	3,727 (38%)	4,798 (40%)	2,868 (46%)
High	16,329 (31%)	2,430 (22%)	937 (34%)	3,218 (30%)	4,241 (43%)	3,352 (28%)	2,150 (34%)
Political Orientation							
Left	20,271 (39%)	4,701 (43%)	983 (36%)	3,842 (36%)	4,208 (43%)	4,726 (40%)	1,812 (29%)
Center	17,358 (33%)	3,912 (36%)	615 (23%)	3,307 (31%)	3,737 (38%)	3,651 (31%)	2,137 (34%)
Right	14,778 (28%)	2,269 (21%)	1,121 (41%)	3,580 (33%)	1,952 (20%)	3,506 (30%)	2,351 (37%)
Survey Round							
8	16,854 (32%)	3,705 (34%)	848 (31%)	3,737 (35%)	2,698 (27%)	3,751 (32%)	2,114 (34%)
10	17,848 (34%)	3,308 (30%)	952 (35%)	3,456 (32%)	3,798 (38%)	4,121 (35%)	2,212 (35%)
11	17,706 (34%)	3,867 (36%)	917 (34%)	3,535 (33%)	3,401 (34%)	4,013 (34%)	1,973 (31%)

Table 1: Descriptive Statistics – Survey-Weighted Estimates

6.1.2. Attitudes towards Climate Change

Climate Belief

In order to measure the cognitive dimension of environmental attitudes and understand what people perceive as the causes of climate change, it is necessary to examine this variable more closely. In the original sample, which consisted of 106,980 individuals, only 559 people denied the existence of climate change. Their response to the question *"Do you think that climate change is caused by natural processes, human activity, or both?"* was *"I don't think climate change is happening."* Although these cases were excluded from the final dataset, the fact that they represent such a small share of the sample is still informative.

Figure 1 shows how beliefs about the causes of climate change vary by age group and welfare regime. While the belief that climate change is caused by human activity dominates in all contexts, the strength of this belief varies. In all six welfare regimes, the youngest age group has the highest share of individuals who believe that climate change is caused by human activities: it reaches nearly 75% in Social-democratic countries. In contrast, older age groups tend to express more uncertainty. This generational divide suggests that younger individuals may be more likely to agree with scientists about the causes of change, while older cohorts are more skeptical. This age difference is strongest in Liberal countries, where older people are much less likely to believe that climate change is caused by human activity.

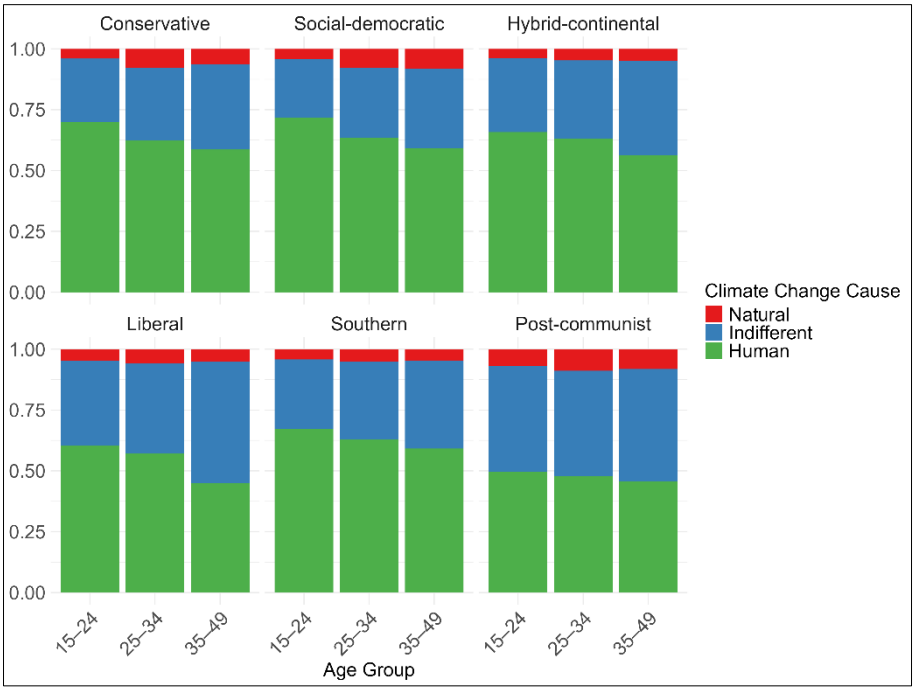

Figure 1: Belief about the Causes of Climate Change by Age Group and Welfare Model

Climate Worry

Figure 2 reveals notable differences in climate worry across both age groups and welfare regime types. Conservative and Southern countries are characterized by higher climate worry across all age groups. In contrast, in Post-communist and Social-democratic countries, climate worry is significantly lower across all age groups, with the majority of respondents indicating "Neutral" worry, and relatively few selecting "High".

Unlike the beliefs about the causes of climate change, a reverse age trend is observed: younger respondents (15-24) are less worried about climate change than older cohorts, who show slightly higher concern. Climate worry is higher in older age groups across all welfare models, with one exception: In Liberal countries, people aged 25-34 reported the highest worry levels. Interestingly, in Conservative and Social-democratic countries there was no notable difference between the age groups, worry levels remain the same in all age categories.

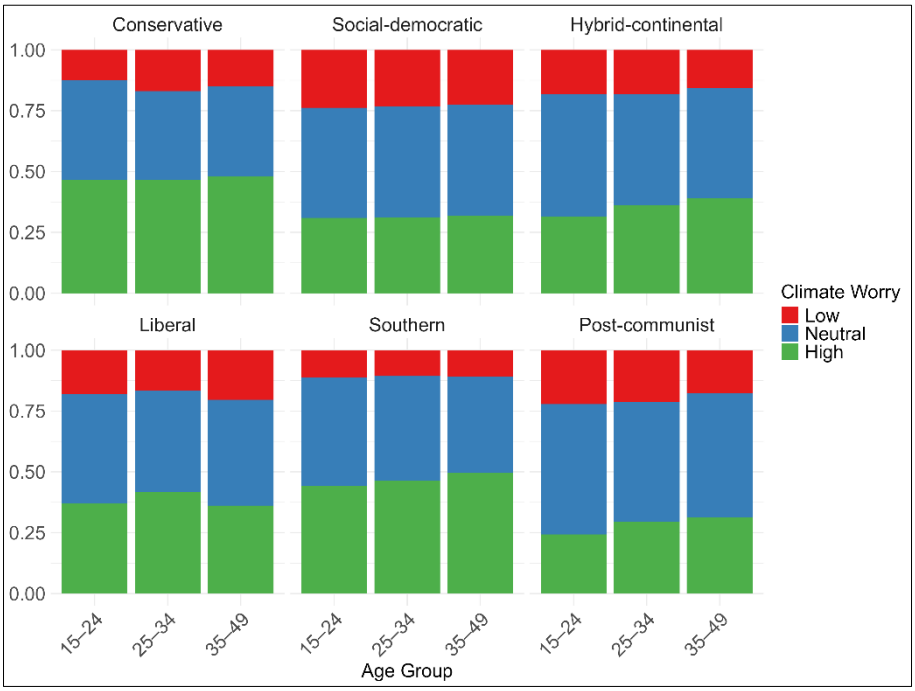

Figure 2: Climate Worry Level by Age Group and Welfare Model

Climate Responsibility

Figure 3 illustrates the distribution of climate responsibility among individuals of reproductive age across different welfare regimes. Although ”Moderate” responsibility is by far the most common response in all countries and age groups, the graph highlights several important differences.

On the one hand, very few respondents chose the lowest category (”None”) across all regimes, indicating a general willingness to engage with climate mitigation. However, Conservative and Post-communist countries show a slightly higher proportion of individuals selecting “None” compared to other regimes. On the other hand, it is clear that preceived responsibility increases with age across all welfare categories. This trend aligns with the findings from the climate worry variable (Figure 2) – older age groups report higher levels of worry and a stronger sense of responsibility to take action. Overall, respondents aged 35-49 in Liberal countries, and those aged 25-34 and 35-49 in Hybrid-continental countries, show the highest levels of perceived responsibility for addressing climate change.

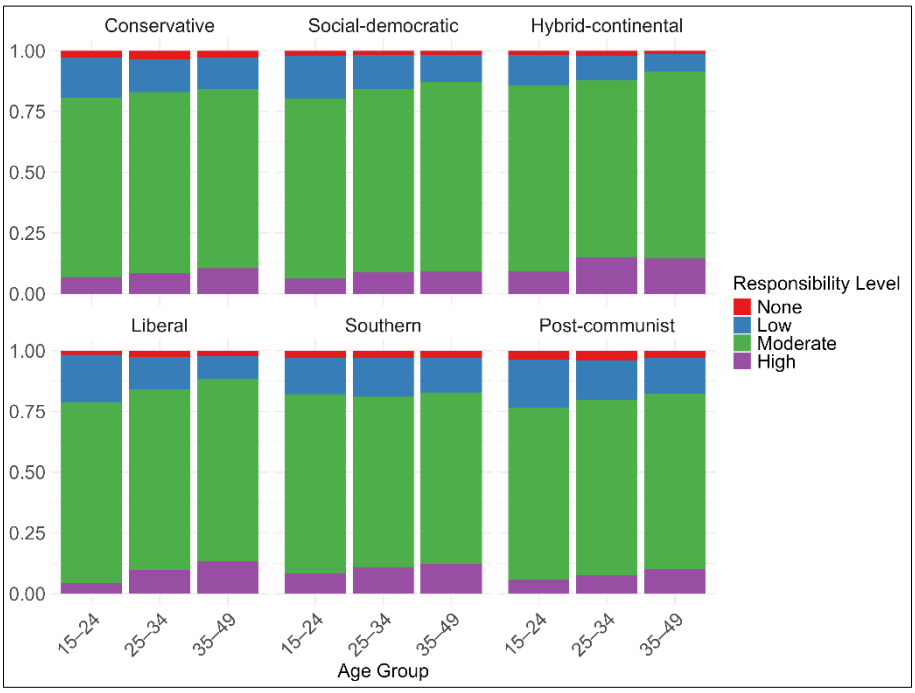

Figure 3: Preceived Responsibility to Reduce Climate Change by Age Group and Welfare Model

6.1.3. Bivariate Relationship: Climate Variables & Fertility Variables

Climate Worry by Number of Children

After examining the univariate distributions of the climate-related variables, this section explores how they relate to fertility at the descriptive level.

Figure 4 presents the proportional distribution of the number of children across levels of climate worry, stratified by welfare regime. Across all regimes, the largest share of respondents report no children, as indicated by the red segments dominating each bar. This pattern is consistent across different levels of climate worry, suggesting that the prevalence of childlessness is similar regardless of climate-related concern.

While the overall structure of fertility outcomes remains relatively stable across levels of climate worry, some variation appears between welfare regimes. Respondents in Southern and Post-communist welfare models display a slightly higher proportion of individuals with two or more children compared to those in Liberal or Social-democratic regimes, where smaller family sizes are more common. Importantly, individuals expressing higher climate concern do not appear to have noticeably fewer (or more) children compared to those with lower concern. This suggests that, under a mere, bivariate perspective, climate worry is not strongly associated with the number of children individuals have.

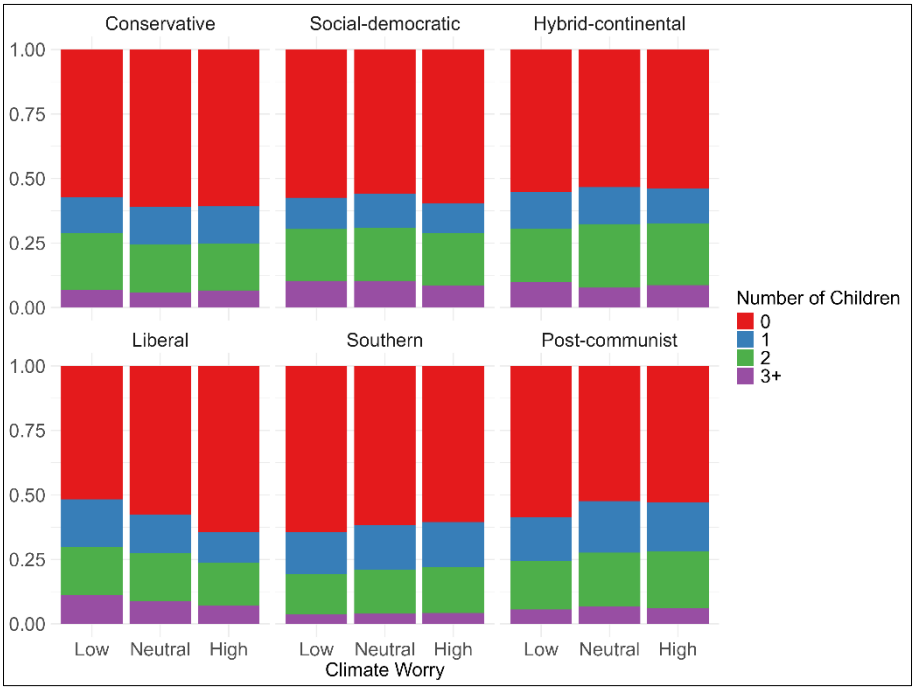

Figure 4: Distribution of Number of Children by Climate Worry Level and Welfare Model

Climate Responsibility by Number of Children

Figure 5 focuses on behavior and explores how fertility outcomes vary across levels of perceived responsibility to reduce climate change, stratified by welfare regime. This analysis extends the descriptive analysis of climate-related attitudes by focusing on normative beliefs (the extent to which individuals feel personally responsible for contributing to climate change mitigation) and their association with actual fertility behavior.

As in the previous visualization (Figure 4), the largest proportion of individuals report not having had children. However, some cross-regime variation is visible. Respondents in Southern and Post-communist countries again show slightly higher shares of individuals with two or more children compared to the Liberal or Social-democratic regimes.

Comparing across levels of perceived responsibility, the overall distributions remain relatively stable. Individuals expressing higher responsibility to reduce climate change do not appear to systematically differ in their number of children compared to those reporting lower or no perceived responsibility. This suggests that normative beliefs about perceived climate responsibility are not strongly linked to actual fertility outcomes.

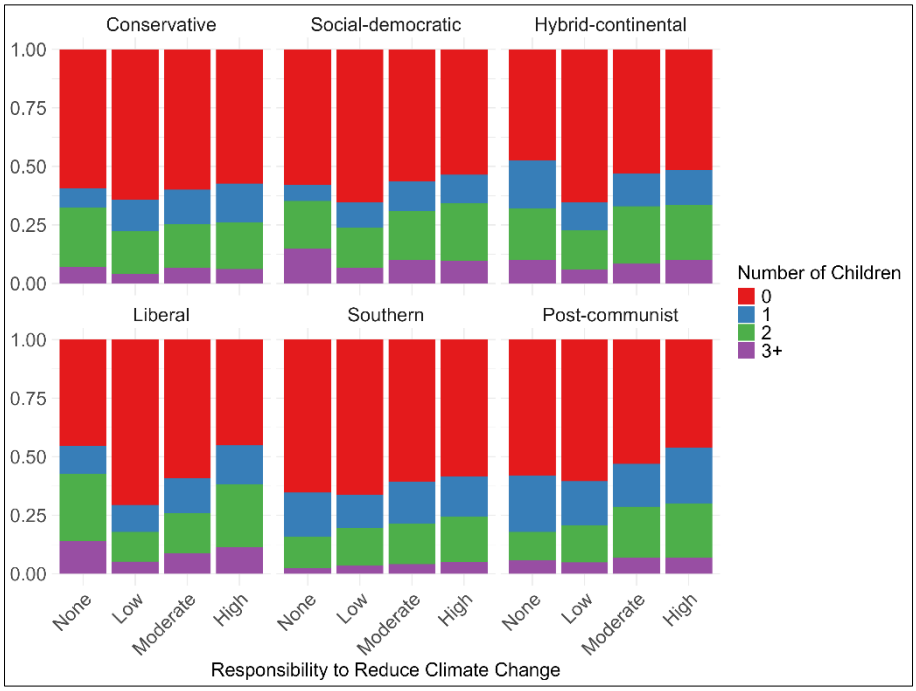

Figure 5: Distribution of Number of Children by Precieved Responsibility to Reduce Climate Change and Welfare Model

6.1.4. Correlation between Climate Variables

In order to build a regression model, the three climate variables must be analyzed in relation to each other. If they are highly correlated, they cannot all be included in the same model, as they would be explaining the same underlying concept.

The trivariate relationship between *climatebelief*, *climateworry*, and *responsibilitytoreduce* reveals a consistent pattern linking cognitive, affective, and behavioral components of environmental attitudes. Figure 6 shows that as levels of climate worry increase from low to high and feelings of personal responsibility strengthen, there is a clear shift in climate change beliefs.

Respondents who express higher worry and greater responsibility are significantly more likely to attribute climate change to human causes, while those with low worry and no or low responsibility are more likely to view it as the result of natural processes. This trend is visible across all responsibility levels, indicating that stronger emotional concern and behavioral commitment to climate action are closely aligned with scientifically grounded beliefs about human causation.

Overall, the relationship suggests that the three climate variables are interrelated: individuals who are more concerned about climate change and feel a greater personal responsibility to act also tend to have more accurate understandings of its causes.

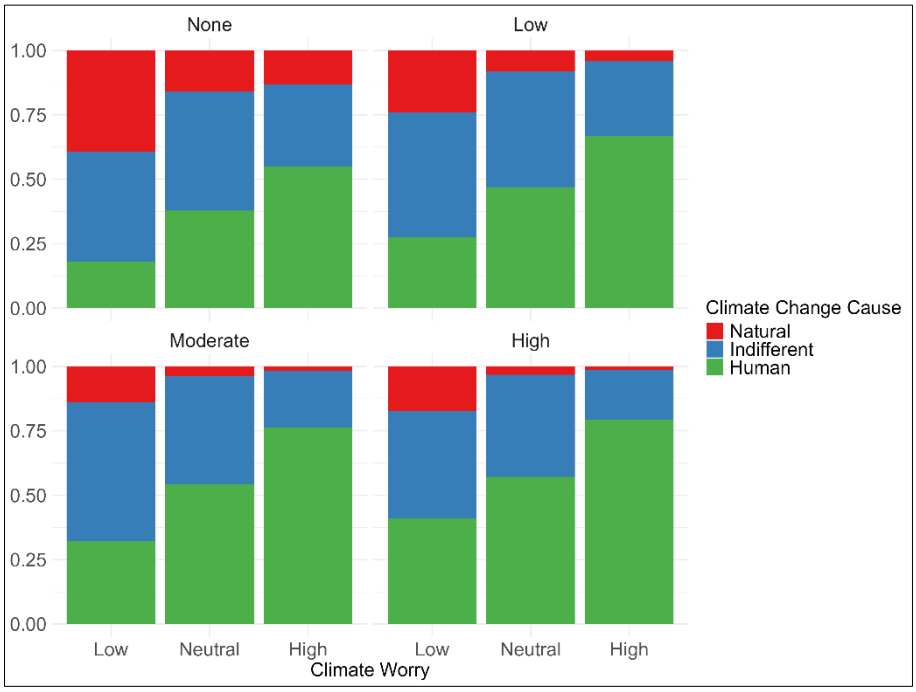

Figure 6: Climate Worry Level by Belief about the Causes of Climate Change, Faceted by Responsibility

To confirm the descriptive findings, two chi-square tests were conducted to examine the associations between the three climate variables and to test whether they are interdependent. Both the test between *climateworry* and *climatebelief*, and the test between *climateworry* and *responsibilitytoreduce* revealed statistically significant relationships.

The level of concern about climate change is strongly associated with how individuals perceive its causes. Respondents with high levels of climate worry are significantly more likely to attribute climate change to human activity, while people with low levels of worry are more likely to believe that it is caused by natural processes or to be indifferent about its origins.

Furthermore, when comparing respondents with different levels of climate worry, those with higher worry are more likely to report high personal responsibility, while those with low worry are more likely to report no or low responsibility.

Overall, these findings indicate that the cognitive (beliefs), affective (worry), and behavioral (responsibility) dimensions of environmental attitudes are strongly interrelated. As most existing studies use climate concern or climate worry as the main indicator, this thesis will also rely on that variable. Because of the interdependence, the other two climate variables will not be included in the regression analyses.

6.2. Regression Analysis

This chapter presents the results of the multivariate regression analyses using survey weights. Throughout the data analysis process, several model specifications were tested before selecting the final versions. Although the full set of tested models is not included in this thesis, this section highlights only those that achieved the best fit and demonstrated the most reliable and interesting results.

The output for the models are expressed in odds ratios, which indicate how much more or less likely the event is to occur in one group compared to another. An odds ratio below 1 means that the category in question has lower odds of the outcome occurring compared to the reference group, while an odds ratio above 1 indicates higher odds. All comparisons are made with respect to the chosen reference category for each variable. In the presented models, the reference categories are marked with a dash (–) instead of an odds ratio.

6.2.1. Logistic Regression Analysis of Fertility Intentions by Climate Worry

This section describes results of the logistic regression, with the dependent variable *everhadchildren* and the independent variable *climateworry*. The analysis aims to assess the association between individuals' level of climate worry and their likelihood of having had children. In these models, the reference category for the dependent variable is having no children, meaning that all estimated odds ratios express the likelihood of having had at least one child compared to having none.

Logistic Baseline Model

The first logistic model (Model 1) serves as a baseline and includes controls for the most influential factors known to shape whether someone has ever had a child: *age_group, gender*, and *educationlevel*. This model is estimated using the full sample of 42,408 individuals.

The logistic regression estimated in Model 1 is:

$$logit(P(Y=1)) = \ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \beta_1(climateworry) + \beta_2(age\_group) + \beta_3(gender) + \beta_4(educationlevel)$$

Where:

- P is the probability that a person has cohabiting children, given their climate worry, age group, gender, and education level.
- Y = 1 means that the person has ever had children.
- The β´s are the regression coefficients from the *svyglm* function from the *survey* package in R.
- The function is expressed in log-odds. To interpret the coefficients as Odds Ratios, each coefficient is exponentiated (exp(β)).

The reference category for *climateworry* is Neutral. Individuals with low climate worry do not differ significantly from this group. However, individuals with high climate worry are 26% less likely (OR = 0.74***) to have had children compared to those who report neutral climate worry. This indicates that higher levels of climate worry are associated with a significantly lower likelihood of parenthood.

As expected, age is a very strong predictor of having had children. Individuals aged 15-24 are approximately 93% less likely (OR = 0.07***) to have had children compared to those aged 25-34. In contrast, individuals aged 35-49 are about six times more likely (OR = 6.64***) to have had children than the reference group.

With regard to gender, women are 70% more likely than men to report having had children (OR = 1.70***).

Finally, education level also shows a clear pattern. Using individuals with medium education as the reference group, those with low education do not differ significantly in their odds of having had children. In contrast, respondents with high education have substantially lower odds of parenthood (OR = 0.64***), meaning they are approximately 36% less likely to have had children than those with medium education.

Because the control variables were added to the model gradually, it was clear that each step reduced the AIC and BIC values. This means that every set of added variables significantly improved the model fit.

Predictors	Odds Ratios[1]
Climate Worry	
Neutral	—
Low	1.11
High	**0.74*** **
Age Group	
25–34	—
15–24	**0.07*** **
35–49	**6.64*** **
Gender	
Male	—
Female	**1.70*** **
Education Level	
Medium	—
Low	1.02
High	**0.64*** **
[1] *p<0.05, **p<0.01, ***p<0.001	
N: 42,408 | AIC/BIC: 39267.27/39304.85	

Table 2: Results of Logistic Regression – Baseline Model (Model 1)

Logistic Age Group Models

Because age is such a strong predictor of parenthood, it is important to examine whether the relationship between climate worry and fertility behavior differs across life stages. For this reason, Model 2 presents separate regressions for each age group. This model also adds two new control variables: *politicalorientation* and *welfaremodel*. Including these controls helps to better understand whether the link between climate worry and having had children remains stable once differences in political views and welfare regime contexts are considered.

Model 2.1 shows the results of the logistic regression for individuals in the youngest age group, based on a sample of 9,066 respondents. Model 2.2 presents the results for the age group 25-34, consisting of 11,933 individuals. Lastly, Model 2.3 includes respondents in the late fertility ages, with a sample size of 21,409.

The logistic regression estimated in Model 2.1–2.3 is:

$$logit(P(Y=1)) = ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \beta_1(climateworry) + \beta_2(gender) + \beta_3(educationlevel) + \beta_4(politicalorientation) + \beta_5(welfaremodel) + \beta_6(round)$$

Where:

- P is the probability that a person has cohabiting children, given their climate worry, gender, education level, political orientation, welfare regime type, and survey round.
- Y = 1 means that the person has ever had children.
- The β´s are the regression coefficients from the *svyglm* function from the *survey* package in R with the appropriate age-specific survey design *(design_15_24, design_25_34, design_35_49)*.
- The function is expressed in log-odds. To interpret the coefficients as Odds Ratios, each coefficient is exponentiated (exp(β)).

Climate worry shows age-specific effects. Model 2.1 indicates that climate worry is not associated with having had children among young adults, likely because most individuals in this age group have not yet reached typical childbearing ages. However, for individuals aged 25-34 (Model 2.2), high climate worry is significantly associated with lower odds of having had children (OR = 0.71***). This means that individuals in the common fertility ages who have high climate worry are 29% less likely to have become parents. For older adults (Model 2.3), climate worry again shows no significant association with past fertility behavior. In this group, the lack of association may reflect that people made their fertility decisions earlier in life, while their climate attitudes were measured much later and may not match what they thought at the time.

Gender differences in the likelihood of having had children become stronger with age. Among the youngest group, gender has no significant effect. In the 25-34 age group, women are more than twice as likely as men to report having had children (OR = 2.03***). This pattern continues in the 35-49 group, where women are 67% more likely than men to have had children (OR = 1.67***). Overall, this shows that gender emerges as a strong predictor of parenthood only in later adulthood, once individuals reach typical childbearing ages.

In terms of education level, the influence of education differs across age groups. In Model 2.1, education has no significant effect on fertility behavior. However, education plays a particularly

important role among the prime birth-giving ages (Model 2.2). Individuals with low education are 83% more likely to have had children than those with medium education (OR = 1.83***). In contrast, highly educated individuals are 55% less likely to have become parents (OR = 0.45***). These patterns should be interpreted with caution, as they may partly reflect fertility postponement and tempo effects. In the 35-49 age group, individuals with low education do not differ significantly from those with medium education in their likelihood of having had children. However, individuals with high education continue to show lower odds of parenthood (OR = 0.82**), although this effect is weaker than in the 25-34 age group. Overall, this pattern suggests that higher education is strongly associated with delayed or reduced fertility during the common childbearing ages.

Political orientation appears to matter mainly for individuals on the left. Among the youngest group (15-24), political views do not significantly relate to whether individuals have had children. In the 25-34 group, however, left-oriented individuals are 41% less likely to have had children compared to those in the center (OR = 0.59***), while right-leaning attitudes show no significant effect. This pattern continues among adults aged 35-49, where left-leaning individuals still display lower odds of having had children (OR = 0.81**), meaning they are about 19% less likely to have become parents. A likely reason for this reduced effect is that most individuals in this age group have already completed their childbearing, leaving less room for political attitudes to influence fertility outcomes.

Lastly, welfare regimes show strong, consistent differences across all age groups. Using Conservative welfare states as the reference category, all other regimes demonstrate significantly lower odds of having had children in the youngest group. In Model 2.2, most regimes show higher odds of having had children compared to Conservative regimes: Social-democratic (OR = 1.47***), Hybrid-continental (OR = 1.43***), Liberal (OR = 1.41**), and Post-communist regimes (OR = 1.54***) all exhibit higher likelihoods of parenthood. The only exception is the Southern regime, where individuals are 54% less likely to have had children (OR = 0.46***). Among adults aged 35-49, the pattern stays, with Social-democratic (OR = 1.52***), Hybrid-continental (OR = 1.69***), Liberal (OR = 1.45*), and Post-communist regimes (OR = 1.23*) again showing higher odds, while Southern regimes continue to show lower likelihoods (OR = 0.78**). Overall, the results show that people in Social-democratic, Hybrid-continental, Liberal, and Post-communist welfare states are generally more likely to have had children than those in Conservative regimes, while individuals in Southern regimes consistently have lower odds across all age groups.

The AIC and BIC values are of course not comparable across the three age-specific models. Model 2.1 has the lowest values, which is expected since few respondents in this age group

have had children. The values rise in Model 2.2 and are highest in Model 2.3, reflecting more complex fertility patterns and greater variability in the older groups.

	Model 2.1 (Age Group 15-24)	Model 2.2 (Age Group 25-34)	Model 2.3 (Age Group 35-49)
Predictors	**Odds Ratios**[1]	**Odds Ratios**[1]	**Odds Ratios**[1]
Climate Worry			
Neutral	—	—	—
Low	1.35	1.11	0.88
High	0.85	**0.71*** **	0.92
Gender			
Male	—	—	—
Female	1.38	**2.03*** **	**1.67*** **
Education Level			
Medium	—	—	—
Low	0.88	**1.83*** **	0.97
High	0.79	**0.45*** **	**0.82** **
Political Orientation			
Center	—	—	—
Left	0.78	**0.59*** **	**0.81** **
Right	1.03	0.92	1.06
Welfare Model			
Conservative	—	—	—
Social-democratic	**0.24*** **	**1.47*** **	**1.52*** **
Hybrid-continental	**0.44*** **	**1.43*** **	**1.69*** **
Liberal	**0.51** **	**1.41** **	**1.45***
Southern	**0.44***	**0.46*** **	**0.78** **
Post-communist	**0.49*** **	**1.54*** **	**1.23***

[1] *p<0.05; **p<0.01; ***p<0.001

N: M2.1 = 9,066; M2.2 = 11,933; M2.3 = 21,409

AIC/BIC: M2.1 = 3220.86/3296.52; M2.2 = 13865.54/13937.40; M2.3 = 22520.29/22592.76

Table 3: Results of Logistic Regression – Age Group Models (Model 2)

Note: All models control for ESS wave effects.

Logistic Interaction Models

After examining how the relationship between climate worry and fertility behavior varies across age groups, the next step is to assess whether this association depends on other key factors. To explore this, four additional logistic regression models (Model 3.1, Model 3.2, Model 3.3, and Model 3.4) were estimated, each including different interaction terms. These models are again based on the full sample of 42,408 respondents.

The four interaction models include all previously used control variables (*gender, age_group, educationlevel, politicalorientation,* and *welfaremodel*) and add interaction terms step by step. Model 3.1 includes the *climateworry* × *gender* interaction, Model 3.2 adds the *climateworry* × *age_group* interaction, Model 3.3 adds the *climateworry* × *welfaremodel* interaction, and Model 3.4 adds the *welfaremodel* × *politicalorientation* interaction.

The logistic regression model estimated in Model 3.4, including all the relevant interactions, is:

$$\text{logit}(P(Y=1)) = \ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \beta_1(\text{climateworry}) + \beta_2(\text{gender}) + \beta_3(\text{age\_group}) + \beta_4(\text{educationlevel}) + \beta_5(\text{politicalorientation}) + \beta_6(\text{welfaremodel}) + \beta_7(\text{round}) + \beta_8(\text{climateworry} \times \text{gender}) + \beta_9(\text{climateworry} \times \text{age\_group}) + \beta_{10}(\text{climateworry} \times \text{welfaremodel}) + \beta_{11}(\text{politicalorientation} \times \text{welfaremodel})$$

Where:

- P is the probability that a person has cohabiting children, given their climate worry, gender, age group, education level, political orientation, welfare regime type, and survey round, as well as the specified interaction terms.
- Y = 1 means that the person has ever had children.
- The β´s are the regression coefficients from the *svyglm* function from the *survey* package in R.
- The function is expressed in log-odds. To interpret the coefficients as Odds Ratios, each coefficient is exponentiated (exp(β)).

Before turning to the interaction terms, it is important to examine how the baseline effects behave across the four models. The effect of climate worry changes slightly when interaction terms are added. In Model 3.1 (gender interaction), neither low nor high climate worry is significantly associated with having had children. However, once age-group interactions are included in Model 3.2, high climate worry becomes significant and is associated with lower odds of parenthood (OR = 0.74**), while low climate worry is associated with higher odds (OR = 1.23*). This aligns with the earlier finding that climate worry appears to be most relevant during the main childbearing ages. This effect becomes non-significant again in Model 3.3 and

Model 3.4, suggesting that the influence of climate worry does not depend strongly on welfare regimes or political orientation.

Other baseline effects remain consistent. Women continue to show higher odds of parenthood across all models (OR = 1.92***), meaning that they are 92% more likely to have had children compared to men. Age group effects also remain almost unchanged: respondents aged 15-24 have very low odds of parenthood (OR = 0.06-0.07***), while those aged 35-49 have significantly higher odds (OR = 6.49-7.03***). Education effects also remain stable, with low education associated with higher odds of parenthood (OR = 1.13*) and high education associated with lower odds (OR = 0.65***). Political orientation shows a consistent pattern as well, with left-leaning individuals being about 28-29% less likely to have had children (OR = 0.71-0.72***), while right-leaning individuals do not differ significantly from the center.

The main effects for welfare regimes change a little across models: In Model 3.1 and Model 3.2, Social-democratic, Hybrid-continental, Liberal, and Post-communist regimes all show higher odds of parenthood compared to Conservative regimes, while Southern regimes consistently show lower odds. However, once welfare interactions are added in Model 3.3 and Model 3.4, changes become visible. The odds ratios for Social-democratic (1.37*), Hybrid-continental (1.50**), and Post-communist regimes (1.37**) slightly increase, suggesting a stronger baseline effect of welfare regimes on fertility. In Model 3.4, some effects weaken further or loose significance, suggesting that while institutional context shapes fertility behavior, part of its effect overlaps with other factors, which reduces the independent influence of welfare regimes once interactions are included.

The interaction term in Model 3.1 aims to explore whether climate worry affects men and women differently. The interaction ”High worry × Female” is significant and below 1 (OR = 0.79**), which indicates that women with high climate worry are 21% less likely to have had children compared to men with high climate worry, after controlling for other factors. This suggests that climate worry matters more for women’s fertility behavior than men’s, reflecting stronger emotional engagement with climate issues among women.

The second interaction model (Model 3.2) examines whether the association between climate worry and parenthood differs across life stages. The results show several statistically significant interaction terms, but the patterns do not form a consistent trend.

For the early fertility ages, the interaction ”Low worry × 15-24” is is not statistically significant, suggesting that low climate worry does not influence early parenthood. However, for the same age group, the interaction ”High worry × 15-24” is significant (OR = 1.45*). This indicates that highly worried young individuals are about 45% more likely to have had children compared to

those with medium levels of climate worry – although this result should be interpreted cautiously due to the very small number of young respondents who have already become parents.

In the 35-49 age group, two interactions are significant but go in opposite directions. The interaction ”Low worry × 35-49” has an odds ratio below 1 (OR = 0.70**), meaning that older adults with low levels of climate worry are 30% less likely to have had children. In contrast, the interaction ”High worry × 35-49” is above 1 (OR = 1.42**), suggesting that older adults with high climate worry are 42% more likely to have had children. This pattern is unlikely to reflect the influence of climate worry on fertility decisions. Instead, it is more likely that climate worry develops or becomes stronger after people have already had their children. This means the patterns reflect attitudes formed later, rather than factors that influenced earlier childbearing decisions.

The interaction in Model 3.3 examines whether the association between climate worry and the likelihood of having had children differs across welfare-state contexts. The results show that almost none of the interaction terms are statistically significant, indicating that climate worry does not operate differently across Europe’s welfare regimes. At the same time, as stated before, in the same model, the main effects of welfare regimes remain strong and consistent: compared to individuals in Conservative welfare states, those living in Social-democratic (OR = 1.37*), Hybrid-continental (OR = 1.50**), and Post-communist regimes (OR = 1.37*) are significantly more likely to have had children (37% to 50%). In contrast, individuals in Southern welfare states show significantly lower odds of parenthood (OR = 0.63**), meaning they are about 37% less likely to have become parents. Importantly, the Liberal welfare regime loses statistical significance in Model 3.3 (OR = 1.38). These results show that the type of welfare state has a clear influence on fertility behavior, but climate worry does not seem to work differently across these welfare systems.

In Model 3.4, the interaction *welfaremodel* × *politicalorientation* aims to examine whether political views shape fertility behavior differently across welfare-state contexts. The results show that almost none of these interactions are statistically significant. Only one combination (right-leaning individuals living in Hybrid-continental welfare regimes) shows a meaningful effect (OR = 1.40*), meaning that they are about 40% more likely to have had children compared to centrist individuals in Conservative regimes. All other welfare-political interactions are not significant, which means that political orientation does not systematically change how fertility differs across welfare regimes. Overall, this model shows little evidence that combining welfare model type with political views explains fertility behavior any better than the main

effects already included, meaning that the interaction term has no additional explanatory power.

The interaction models show that climate worry does not consistently predict fertility behavior across all models. It only becomes significant in the age-group interaction model (Model 3.2), where higher climate worry is associated with lower odds of parenthood among individuals aged 25-34. This finding aligns with the age-group model (Model 2.2), which similarly shows that climate worry is relevant only during the main reproductive years. This suggests that climate worry is not a universally stable predictor, but rather gains relevance only during the main childbearing years. In contrast, interactions with gender, welfare regime, and political orientation do not show meaningful moderating effects. However, other effects remain stable when interactions are added, indicating that the underlying patterns observed in earlier models are robust.

In comparing the AIC and BIC values across the four interaction models, there is only limited improvement in model fit as additional interaction terms are added. Model 3.1 has the highest AIC and BIC values (38516.86 / 38622.50), indicating the weakest fit. Model 3.2 shows slightly lower AIC and BIC (AIC 38443.11 / BIC 38573.04), suggesting that age-specific interactions add some explanatory power. Model 3.3 has almost the same AIC to Model 3.2 (38441.13) but a slightly higher BIC (38631.71), meaning that the added complexity is not strongly supported by the data. Finally, Model 3.4 has the highest BIC and almost the highest AIC among the four (38448.02 / 38701.86), showing that the *welfaremodel* × *politicalorientation* interaction does not meaningfully improve the model and is penalized for increased complexity. Overall, this suggest that introducing interaction terms provides only minimal gains in explanatory power, and the simpler models are more efficient.

Despite this, the interaction results are informative because they highlight where climate worry does and does not vary across social groups, offering useful insights even though the overall model fit improves only slightly.

Predictors	Model 3.1 (worry × gender) Odds Ratios[1]	Model 3.2 (+ worry × age group) Odds Ratios[1]	Model 3.3 (+ worry × welfare) Odds Ratios[1]	Model 3.4 (+ political × welfare) Odds Ratios[1]
Climate Worry				
Neutral	—	—	—	—
Low	1.03	**1.23***	1.25	1.26
High	0.94	**0.74****	0.81	0.81
Gender				
Male	—	—	—	—
Female	**1.92*****	**1.92*****	**1.92*****	**1.92*****
Age Group				
25–34	—	—	—	—
15–24	**0.07*****	**0.06*****	**0.06*****	**0.06*****
35–49	**7.03*****	**6.49*****	**6.54*****	**6.58*****
Education Level				
Medium	—	—	—	—
Low	**1.13***	**1.13***	**1.13***	**1.13***
High	**0.65*****	**0.65*****	**0.65*****	**0.65*****
Political Orientation				
Center	—	—	—	—
Left	**0.71*****	**0.71*****	**0.72*****	**0.72****
Right	0.99	0.99	1.00	0.92
Welfare Model				
Conservative	—	—	—	—
Social-democratic	**1.31*****	**1.31*****	**1.37***	1.25
Hybrid-continental	**1.41*****	**1.41*****	**1.50****	1.28
Liberal	**1.31****	**1.32****	1.38	1.46
Southern	**0.64*****	**0.64*****	**0.63****	**0.59***
Post-communist	**1.27*****	**1.27****	**1.37****	**1.56****
Climate Worry * Gender				
Low * Female	1.00	0.96	0.97	0.97
High * Female	**0.79****	**0.81****	**0.81****	**0.81****
Climate Worry * Age Group				
Low * 15–24		1.06	1.04	1.02
High * 15–24		**1.45***	**1.45***	**1.43***
Low * 35–49		**0.70****	**0.71****	**0.71****
High * 35–49		**1.42****	**1.37****	**1.36****
Climate Worry * Welfare Model				
Low * Social-democratic			0.96	0.95
High * Social-democratic			0.91	0.92
Low * Hybrid-continental			0.92	0.91
High * Hybrid-continental			0.89	0.91
Low * Liberal			1.32	1.28
High * Liberal			0.79	0.83
Low * Southern			0.87	0.87
High * Southern			1.04	1.04
Low * Post-communist			0.79	0.79
High * Post-communist			0.94	0.94

Welfare Model * Political Orientation	
Social-democratic * Left	1.07
Hybrid-continental * Left	1.15
Liberal * Left	0.82
Southern * Left	1.11
Post-communist * Left	0.86
Social-democratic * Right	1.21
Hybrid-continental * Right	**1.40***
Liberal * Right	1.07
Southern * Right	1.12
Post-communist * Right	0.83

[1] *p<0.05; **p<0.01; ***p<0.001

N: 42,408

AIC/BIC: M3.1 = 38516.86/38622.50; M3.2 = 38443.11/38573.04; M3.3 = 38441.13/38631.71; M3.4 = 38448.02/38701.86

Table 4: Results of Logistic Regression – Interaction Models (Model 3)

Note: All models control for ESS wave effects.

6.2.2. Multinomial Regression Analysis of Number of Children by Climate Worry

In the next section, the results of the multinomial regression are presented, which uses *numberofchildren* as the dependent variable and *climateworry* as the key explanatory factor. The goal of this analysis is to examine whether higher levels of climate worry are associated with different family size outcomes, providing a more detailed view of how climate concern may relate to fertility behavior beyond just whether someone has children or not. In this analysis, the reference category for the dependent variable is having no children, meaning that all odds ratios are interpreted relative to individuals without children.

Multinomial Baseline Model

The first multinomial model (Model 4) serves as the baseline and uses the same control variables as the logistic baseline model (Model 1) for the complete sample of 42,408 participants.

The multinomial logistic regression described by Model 4 is:

$$ln\left(\frac{P(Y=r)}{P(Y=0)}\right) = \beta_{r0} + \beta_{r1}(climateworry) + \beta_{r2}(age\_group) + \beta_{r3}(gender) + \beta_{r4}(educationlevel)$$

Where:

- P(Y=r) is the probability that a person has r children, given their climate worry, age group, gender, and education level.
- P(Y=0) is the probability that a person has 0 children.
- Y is the categorical outcome variable *numberofchildren*, with reference category Y=0.
- The β_{rj} are the regression coefficients for category r from the *svy_glm* function from the *survey* package in R.
- The function is expressed in log-odds relative to the reference category. To interpret the coefficients for each outcome category r as Odds Ratios compared to the reference category, each coefficient is exponentiated ($\exp(\beta_{rj})$).

Across all three parity categories, high climate worry is consistently linked to lower odds of being in a higher-parity group compared to having no children. For example, when comparing individuals with one child to those with zero children (the reference category), those with high climate worry have 21% lower odds of being in the one-child group (OR = 0.79***), while low worry shows no significant difference from the neutral group. A similar pattern appears for two children, where high climate worry is associated with a 22% lower likelihood of having two children (OR = 0.78***), and low worry again shows no significant association. For three or more children, high worry is also linked to lower odds (OR = 0.78*), indicating a 22% reduction in the likelihood of large families, whereas low worry remains non-significant.

Age is clearly the strongest predictor of the number of children individuals have, consistent with the findings from the logistic models in the previous chapter. Compared to the reference group (ages 25-34), people aged 15-24 are significantly less likely to have children at any parity level: they are 91% less likely to have one child (OR = 0.09***), 94% less likely to have two children (OR = 0.06***), and 96% less likely to have three or more children (OR = 0.04***). In contrast, adults aged 35-49 show significantly higher odds of parenthood in all categories: they are 239% more likely to have one child (OR = 3.39***), more than seven times more likely to have two children (OR = 7.31***), and almost eight times more likely to have three or more children (OR = 7.88***). Overall, these results reflect typical life-course fertility patterns: younger adults rarely have children, while older adults are far more likely to have more children.

Gender shows a consistent pattern across all family-size categories. Women have significantly higher odds of having children than men at every parity level. Women are 83% more likely than men to have become parents (OR = 1.83***). The pattern is similar for two children, where women are 73% more likely to have two children compared to men (OR = 1.73***). This difference is even slightly stronger for three or more children, with women being 86% more likely to have larger families (OR = 1.86***).

Education level shows a clear and consistent pattern in fertility behavior. Compared to individuals with medium education, those with high education are less likely to have children across almost all parity levels. Highly educated individuals are 28% less likely to have one child (OR = 0.72***), 24% less likely to have two children (OR = 0.76***), and 24% less likely to have three or more children (OR = 0.76**). In contrast, individuals with low education show mixed patterns. Low education has no significant effect on the likelihood of having one child, and it is actually associated with a 16% lower likelihood of having two children (OR = 0.84**). However, for larger families, the pattern reverses: individuals with low education are 44% more likely to have three or more children (OR = 1.44***).

Overall, the multinomial baseline results closely align with the logistic baseline model. In both analyses (Model 1 and Model 4), high climate worry is associated with a lower likelihood of parenthood, and this pattern remains consistent across all family-size categories. Likewise, age, gender, and education show very similar effects in both models: age is the strongest predictor of fertility behavior, women have higher odds of having children than men, and higher education is linked to lower fertility.

Predictors	Odds Ratios (Child = 1)[1]	Odds Ratios (Child = 2)[1]	Odds Ratios (Child = 3)[1]
Climate Worry			
Neutral	—	—	—
Low	1.02	1.01	1.20
High	**0.79*** **	**0.78*** **	**0.78***
Age Group			
25–34	—	—	—
15–24	**0.09*** **	**0.06*** **	**0.04*** **
35–49	**3.39*** **	**7.31*** **	**7.88*** **
Gender			
Male	—	—	—
Female	**1.83*** **	**1.73*** **	**1.86*** **
Education Level			
Medium	—	—	—
Low	0.92	**0.84** **	**1.44*** **
High	**0.72*** **	**0.76*** **	**0.76** **

[1] *p<0.05; **p<0.01; ***p<0.001

N = 42,408

AIC/BIC: 94637.31/94845.03

Table 5: Results of Multinomial Regression – Baseline Model (Model 4)

Note: „Child = 3" indicates three or more children.

The marginal effects plot (Figure 7), based on Model 4 illustrates how key predictors influence the probability of having 0, 1, 2, or 3+ children, while controlling for the most influential factors in fertility behavior.

Climate worry displays small effects: individuals with high climate concern are slightly more likely to remain childless and less likely to have one or more children, although the effects are

small. Age group shows clearer patterns: respondents aged 15-24 have a higher probability of having no children and lower probabilities of having children, while those aged 35-49 are more likely to have one or more children. Gender is also influential, with women less likely to report zero children and slightly more likely to have children than men. Education demonstrates a similar pattern: higher educational attainment is associated with a greater probability of remaining childless and a lower probability of larger family sizes. Overall, sociodemographic characteristics (age, gender, and education) show stronger associations with fertility outcomes than attitudinal factors like climate worry.

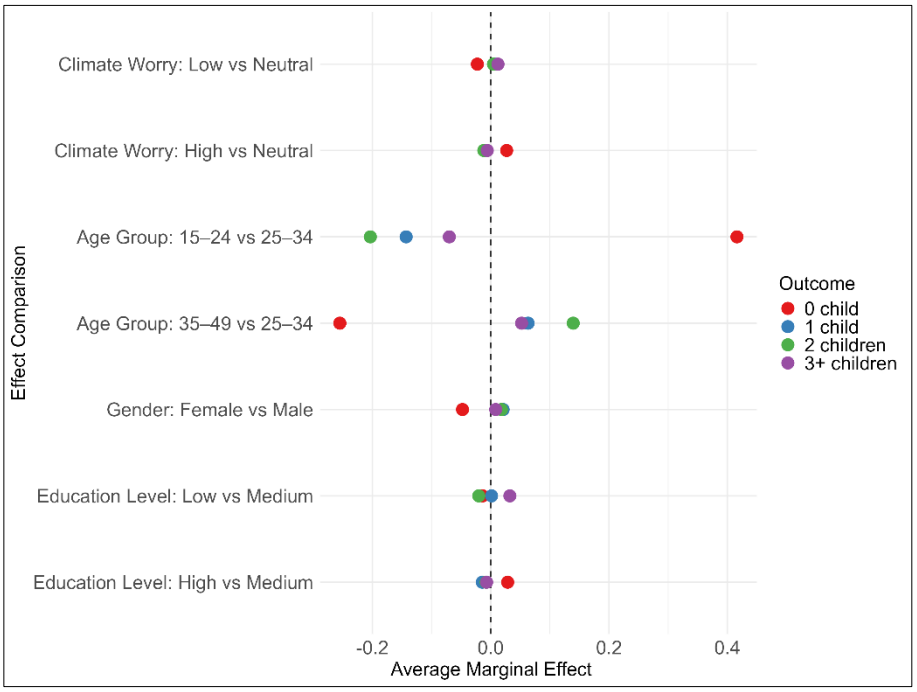

Figure 7: Average Marginal Effects (Model 4)

Multinomial Age Group Models

Building on Model 2, the next set of analyses examines how climate worry relates not only to the transition to parenthood but also to variation in family size. Model 5 includes the same control variables as Model 2 and assesses whether associations between climate worry and fertility outcomes differ across the life course. This approach helps us better understand how climate concerns relate to different parity levels. The analyses use the same samples as Model 2: Model 5.1 includes 9,066 individuals, Model 5.2 includes 11,933 individuals, and Model 5.3 includes 21,409 individuals.

The multinomial logistic regression described by Model 5.1–5.3 is:

$$\ln\left(\frac{P(Y=r)}{P(Y=0)}\right) = \beta_{r0} + \beta_{r1}(climateworry) + \beta_{r2}(gender) + \beta_{r3}(educationlevel) + \beta_{r4}(politicalorientation) + \beta_{r5}(welfaremodel) + \beta_{r6}(round)$$

Where:

- P(Y=r) is the probability that a person has r children, given their climate worry, gender, education level, political orientation, welfare regime type, and survey round.
- P(Y=0) is the probability that a person has 0 children.
- Y is the categorical outcome variable *numberofchildren*, with reference category Y=0.
- The β_{rj} are the regression coefficients for category r from the *svy_glm* function from the *survey* package in R with the appropriate age-specific survey design *(design_15_24, design_25_34, design_35_49).*
- The function is expressed in log-odds relative to the reference category. To interpret the coefficients for each outcome category r as Odds Ratios compared to the reference category, each coefficient is exponentiated ($\exp(\beta_{rj})$).

The results show a clear age pattern in how climate worry relates to fertility. Among young adults aged 15-24 (Model 5.1), climate worry has no significant effect on the likelihood of having one, two, or three or more children. In the key childbearing years (Model 5.2), climate worry shows its strongest and most consistent effects – just as in the logistic analysis. Individuals with high climate worry are 25% less likely to have one child (OR = 0.75**), 28% less likely to have two children (OR = 0.72**), and 50% less likely to have three or more children (OR = 0.50*) compared with those who report neutral worry. Low worry again shows no significant differences from the neutral category. Among adults aged 35-49 (Model 5.3), climate worry is again unrelated to fertility outcomes. Only one weak effect appears: individuals with low worry are 16% less likely to have two children (OR = 0.84*). All high worry effects are non-significant.

Overall, the multinomial findings closely match the logistic results, which also showed that climate worry matters only during the main reproductive years. Individuals aged 15-24 have typically not yet entered parenthood, while worry among respondents aged 35-49 may have formed after their fertility decisions were completed. Together, Model 2 and Model 5 suggest that the link between climate worry and fertility varies across different stages of adulthood.

Gender differences in fertility vary clearly by age. Among young adults aged 15-24 (Model 5.1), gender has almost no effect on the likelihood of having one or two children. The only significant effect appears for three or more children (OR = 7.62*), likely reflecting rare cases of early motherhood. In the 25-34 age group (Model 5.2), gender effects become stronger across all parity levels. Women are 97% more likely to have one child (OR = 1.97***), 165% more likely to have two children (OR = 2.65***), and 220% more likely to have three or more children (OR = 3.20***) than men. Among adults aged 35-49 (Model 5.3), gender remains a strong predictor of family size. Women are 79% more likely to have one child (OR = 1.79***), 62% more likely to have two children (OR = 1.62***), and 71% more likely to have three or more children (OR = 1.71***) compared to men.

These multinomial patterns align with the logistic findings, where gender emerged as a meaningful predictor only once individuals reach typical childbearing ages. In both Model 2 and Model 5, gender differences are minimal in early adulthood but become much stronger among people aged 25-34 and 35-49.

Education shows a clear age-specific structure. Among young adults (Model 5.1), education has no significant effect on the likelihood of having one, two, or three or more children. The strongest educational effects appear at the age group 25-34 (Model 5.2). Compared with medium education, respondents with low education are 102% more likely to have two children (OR = 2.02***) and 287% more likely to have three or more children (OR = 3.87***). By contrast, highly educated respondents are 45% less likely to have one child (OR = 0.55***), 58% less likely to have two children (OR = 0.42***), and 80% less likely to have three or more children (OR = 0.20***). Among adults aged 35-49 (Model 5.3), the influence of education weakens. Low education is associated with a lower likelihood of having two children (OR = 0.77***) but a higher likelihood of having three or more children (OR = 1.48**). High education shows no significant effects at any parity level in this age group, suggesting that educational differences narrow once fertility is largely completed.

These results again match the logistic analysis: education does not matter in early adulthood, becomes highly influential during the central childbearing years, and weakens in later life. Across Model 2 and Model 5, higher education is consistently linked to delayed or reduced fertility, while lower education is associated with earlier and larger family formation.

Political orientation shows an age-dependent relationship with fertility, driven entirely by individuals on the left. Among respondents aged 15-24 (Model 5.1), only one statistically significant effect appears: left-leaning individuals are 88% less likely to have three or more children (OR = 0.12**). This result should be interpreted cautiously because it likely reflects rare early parenthood cases. The strongest effects occur in the 25-34 age group (Model 5.2).

Left-leaning respondents have significantly lower odds of having children across all parity levels: they are 37% less likely to have one child (OR = 0.63***), 33% less likely to have two children (OR = 0.67***), and 41% less likely to have three or more children (OR = 0.59*), compared with individuals at the political center. Right-leaning individuals show no significant differences from the center. Among adults aged 35-49 (Model 5.3), these effects weaken but do not disappear. Left-leaning respondents are 16% less likely to have two children (OR = 0.84*) and 32% less likely to have three or more children (OR = 0.68***), while right-leaning individuals again show no significant differences.

Overall, the multinomial findings align closely with the logistic results. In both analyses, left-leaning individuals show lower odds of parenthood during the main childbearing years, while political orientation has little influence in early adulthood and becomes less important once fertility is largely completed.

Welfare-regime differences appear most clearly in early and middle adulthood, suggesting that regimes may influence the timing of childbearing rather than whether individuals eventually become parents. Among young adults aged 15-24 (Model 5.1), several regimes show significantly lower odds of childbearing relative to Conservative regimes. However, these differences do not indicate a meaningful behavioral variation due to rare fertility cases in young ages.

In Model 5.2 (ages 25-34), welfare regime differences become stronger and more informative. All regime types, except for the Southern one, show higher odds of childbearing relative to Conservative regimes. Social-democratic regimes show significantly higher odds of having two children (OR = 1.83***) and three or more children (OR = 2.74***). Similarly, Hybrid-continental regimes exhibit higher odds across all parity levels (OR = 1.32*, OR = 1.85***, and OR = 2.16**). In Liberal regimes, individuals aged 25-34 are 93% more likely to have three or more children (OR = 1.93*), although the effects for one or two children are not significant. In contrast, Southern regimes show the opposite pattern: respondents are significantly less likely to have children at all parity levels compared to Conservative countries. They are 30% less likely to have one child (OR = 0.70***), 65% less likely to have two children (OR = 0.35***), and 75% less likely to have three or more children (OR = 0.25***), reflecting a low fertility across the countries and possibly weaker family-support. Post-communist regimes again show similarly elevated odds: Individuals are 83% more likely to have one child (1.83***) and 42% more likely to have two children (1.42**).

Among adults aged 35-49 (Model 5.3), regime differences become inconsistent and do not form a coherent pattern. Some associations remain – for example, higher odds in Social-democratic regimes for two and three or more children (OR = 1.37***, OR = 2.03***), and higher

odds in Hybrid-continental regimes across all parity levels (OR = 1.34*, OR = 1.73***, OR = 1.80***). Post-communist regimes show higher odds for one child (OR = 1.30**). Southern regimes continue to display lower odds, with a strong negative association for three or more children (OR = 0.50***).

The results align with the logistic findings: welfare-regime differences are most pronounced during the main childbearing years (25-34), when institutional contexts are most relevant for fertility decisions. Social-democratic, Hybrid-continental, Liberal, and Post-communist regimes generally show higher odds of parenthood than Conservative regimes, while Southern regimes consistently exhibit lower odds of childbearing across all life stages.

Overall, the logistic (Model 2) and multinomial (Model 5) age-group models show highly similar patterns. In both approaches, climate worry, gender, education, political orientation, and welfare-regime differences matter most during the main childbearing years, show little relevance in early adulthood, and weaken again once fertility is largely completed. The consistency across model types indicates that the observed relationships are robust, regardless of whether fertility is measured as a binary outcome or as differences across family sizes.

AIC and BIC values are again not comparable in the age-specific models because the sample sizes differ, similar to what is seen in Model 2.

	Model 5.1 (Age Group 15–24)			Model 5.2 (Age Group 25–34)			Model 5.3 (Age Group 35–49)		
Predictors	**Odds Ratios** (Child = 1)[1]	**Odds Ratios** (Child = 2)[1]	**Odds Ratios** (Child = 3)[1]	**Odds Ratios** (Child = 1)[1]	**Odds Ratios** (Child = 2)[1]	**Odds Ratios** (Child = 3)[1]	**Odds Ratios** (Child = 1)[1]	**Odds Ratios** (Child = 2)[1]	**Odds Ratios** (Child = 3)[1]
Climate Worry									
Neutral	—	—	—	—	—	—	—	—	—
Low	1.45	0.81	1.55	0.93	1.17	1.17	0.93	**0.84***	0.92
High	0.81	0.96	0.18	**0.75****	**0.72****	**0.50***	0.93	0.93	1.05
Gender									
Male	—	—	—	—	—	—	—	—	—
Female	1.62	0.89	**7.62***	**1.97*****	**2.65*****	**3.20*****	**1.79*****	**1.62*****	**1.71*****
Education Level									
Medium	—	—	—	—	—	—	—	—	—
Low	0.71	1.16	1.54	1.22	**2.02*****	**3.87*****	0.86	**0.77*****	**1.48****
High	0.78	0.49	2.97	**0.55*****	**0.42*****	**0.20*****	0.93	1.02	1.07
Political Orientation									
Center	—	—	—	—	—	—	—	—	—
Left	0.83	0.86	**0.12****	**0.63*****	**0.67*****	**0.59***	0.88	**0.84***	**0.68*****
Right	1.03	1.36	0.30	0.94	1.15	1.06	0.97	1.00	1.00
Welfare Model									
Conservative	—	—	—	—	—	—	—	—	—
Social-democratic	**0.29*****	**0.09*****	0.79	1.25	**1.83*****	**2.74*****	1.10	**1.37*****	**2.03*****
Hybrid-continental	**0.43****	**0.29****	1.29	**1.32***	**1.85*****	**2.16****	**1.34***	**1.73*****	**1.80*****
Liberal	0.57	**0.17*****	**12.4****	1.22	1.34	**1.93***	1.25	1.20	1.60
Southern	**0.44***	0.46	1.83	**0.70*****	**0.35*****	**0.25*****	1.18	0.85	**0.50*****
Post-communist	**0.63***	**0.17*****	1.09	**1.83*****	**1.42****	1.41	**1.30****	1.14	1.02

[1] *p<0.05; **p<0.01; ***p<0.001

N: M5.1 = 9,066; M5.2 = 11,933; M5.3 = 21,409

AIC/BIC: M5.1 = 4922.27/5242.32; M5.2 = 24374.44/24706.85; M5.3 = 62926.99/63285.71

Table 6: Results of Multinomial Regression – Age Group Models (Model 5)
Notes: All models control for ESS wave effects. „Child = 3" indicates three or more children.

Because the main childbearing ages are the most influential for fertility outcomes – when attitudes, education, and other social factors have the greatest opportunity to shape reproductive behavior – the average marginal effects for the 25-34 sample offer particularly relevant insights. Figure 8 shows how climate worry, gender, education level, political orientation, and welfare regime influence the probability of having 0, 1, 2, or 3+ children, based on Model 5.2.

Similar to Figure 7, climate worry shows only modest associations. Individuals with high climate worry are slightly more likely to remain childless and marginally less likely to have one or more children. Gender patterns are also similar to Figure 7: women are less likely to have zero

children. Education level continues to be a strong predictor: highly educated respondents have a higher probability of remaining childless and a lower probability of having multiple children. In contrast, those with lower education show slightly higher probabilities of larger family sizes.

Political orientation has smaller effects. Respondents on the politicall right show a slightly higher probability of having two or more children and a lower probability of remaining childless. On the contrary, left-leaning individuals show a marginally higher likelihood of remaining childless and lower likelihood of having multiple children.

Welfare regime differences are modest but patterned. Compared with respondents in Conservative welfare regimes, those in Hybrid-continental, Post-communist, and Social-democratic regimes show lower probabilities of remaining childless and somewhat higher probabilities of having two children. Additionally, respondents in Post-communist regimes are significantly more likely to have exactly one child. For Liberal regimes, the marginal effects are very close to zero across all outcomes, but individuals are slightly less likey to remain childless and more likely to have three or more children. Finally, respondents in Southern regimes stand out as having a clearly higher probability of remaining childless and a lower probability of having more children compared with the Conservative reference group.

Overall, within the core reproductive ages, education, gender, and welfare regime have stronger associations with fertility outcomes than climate worry or political orientation.

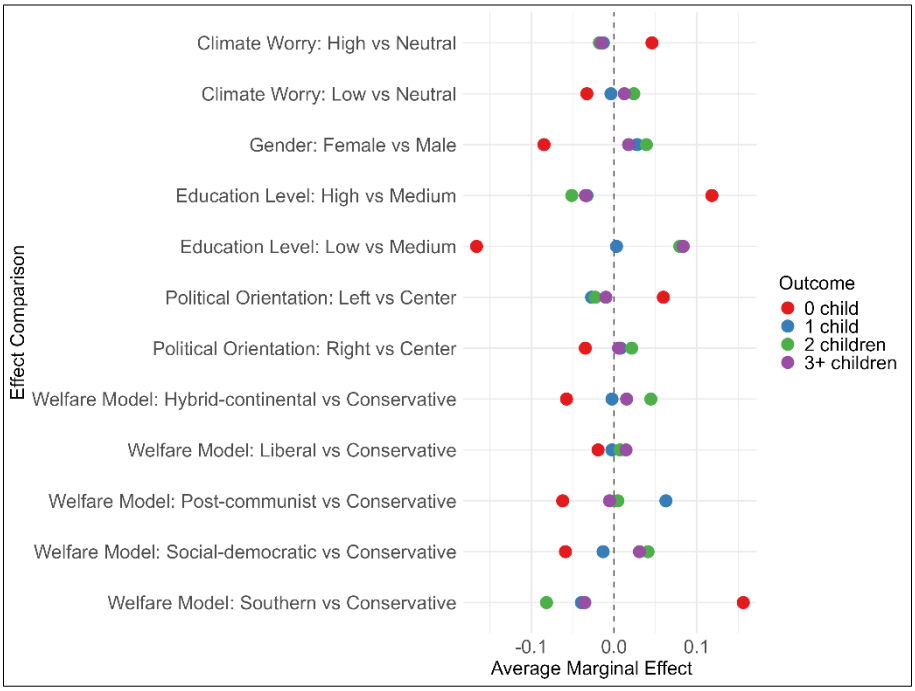

Figure 8: Average Marginal Effects – Age Group 25-34 (Model 5.2)

6.3. Sensitivity Analysis

To assess whether the results of the main models are robust and not driven by model specification or missing data, sensitivity analyses were conducted using complete-case models and models with progressively added control variables.

Serveral additional control variables – such as *health, maritalstatus, religion,* and *netincome* – either did not improve the model fit or contained substantial amounts of missing data, and were therefore not included in the main models. Table 7 in Appendix F shows the descriptive statistics of the variables. To examine whether the inclusion of these variables affects the results, they were added stepwise in a series of sensitivity models.

Restricting the analysis to complete cases significantly reduced the sample size (from 42,408 to 17,754) and may have led to a loss of representativeness. However, the main effects remained stable across all sensitivity models, suggesting that the main findings are robust and not influenced by missing data or model choices.

6.3.1. Logistic Regression

The robustness checks presented in Table 8 of Appendix F show that the main relationship between climate worry and fertility outcomes remains stable across all model specifications.

Even after restricting the analysis to complete cases (Model 6.2) and stepwise adding additional control variables – *health* (Model 6.3), *maritalstatus* (Model 6.4), *religion* (Model 6.5), and *netincome* (Model 6.6) – the results for climate worry and the other main predictors do not change much in terms of size, direction, or significance.

6.3.2. Multinomial Regression

Because the multinomial model is more complex, separate models had to be estimated. Model 7.1 uses the original full sample, Model 7.2 uses only the non-missing sample, Model 7.3 includes *health*, Model 7.4 adds *maritalstatus*, Model 7.5 adds *religion*, and Model 7.6 includes *netincome*.

The robustness check results in Tables 9-14 of Appendix F confrirm that adding these extra control variables does not change the main results. This indicates that the findings are not driven by missing data or model specification choices, and can therefore be considered robust, which increases the confidence of the findings.

7. DISCUSSION

This thesis examined whether environmental attitudes – specifically levels of climate worry – are associated with fertility behavior in Europe, focusing on both the transition to parenthood and variation in family size. It also explored whether these associations vary across demographic, socioeconomic, and institutional contexts, particularly across welfare regime types and life-course stages, using data on 19 European countries from the European Social Survey.

To answer RQ1 (whether climate worry is associated with parenthood and family size), the regression analyses show that higher levels of climate worry are associated with a lower likelihood of having had children and with smaller family sizes, supporting H1 and H2. These findings are consistent with studies that suggest environmental concern can reduce fertility intentions (e.g., Arnocky et al., 2012; Golovina & Jokela, 2024; Powdthavee et al., 2024; Bastianelli, 2024). However, the strength of the association in this study is modest, aligning with previous research that found weak or inconsistent links between climate concern and reproductive behavior (e.g., De Rose & Testa, 2015; Jylhä, Kolk, & Fairbrother, 2024; Szczuka, 2022). It should also be noted that differences across age groups may partly reflect fertility postponement, as cross-sectional data cannot capture the timing of births.

Importantly, the results show that the relationship between climate worry and fertility is age specific, appearing only among individuals aged 25-34. Among younger individuals aged 15-24, climate worry shows no significant association with fertility behavior, likely because most have not yet entered parenthood. Among adults aged 35-49, climate worry is also not significantly associated with fertility outcomes, which may indicate that climate attitudes could have developed or strengthened after most fertility decisions were already made. Based on the age group models, 25-34 age group is the only one in which a clear relationship appears, suggesting that climate worry may be most relevant during the phase of active childbearing decisions. This supports H3, which proposes that the association between climate worry and whether individuals have children is most evident during the main reproductive years, even though the data do not show when in the life course these births occurred.

To answer RQ2 (whether the association between climate worry and fertility behavior differs across sociodemographic groups), the analysis confirms that age, gender, and education are stronger and more consistent predictors of fertility behavior than attitudinal variables such as climate worry or political orientation. This aligns with established demographic research

showing that structural factors (especially age and education) strongly shape fertility timing and outcomes (Badolato et al., 2024; Lesthaeghe, 2014).

As expected, age is the strongest predictor, reflecting the importance of life-course timing in fertility decision-making. Women have consistently higher odds of parenthood and larger family size compared with men, and these differences persist across the later reproductive years, which likely reflects both biological differences in childbearing and potential differences in how men and women report parenthood in survey data. Furthermore, the results show that higher levels of education are associated with delayed or reduced fertility, in line with rational choice and life-course theories (Becker, 1991; Lesthaeghe, 2014), while lower education is linked to higher likelihoods of larger families.

Political orientation shows moderate and age-specific patterns. Left-leaning individuals have lower odds of being parents during the main childbearing years, but this does not necessarily mean they will remain childless – they may simply be postponing parenthood. Political orientation shows little association in early adulthood and becomes less relevant once most individuals have completed their fertility. This suggests that political attitudes may shape fertility-related values during the years when people actively face childbearing decisions, but they are less influential before or after this phase.

Welfare regime differences are clearly visible. Individuals in Social-democratic (Sweden, Norway, Finland, Iceland), Hybrid-continental (Belgium, France, Netherlands), Liberal (Ireland, United Kingdom), and Post-communist regimes (Czechia, Hungary, Poland, Lithuania, Slovenia) are generally more likely to have had children compared with those in Conservative regimes (Austria, Germany), while individuals in Southern regimes (Spain, Italy, Portugal) consistently show lower odds of parenthood and smaller family sizes. This reflects varying levels of institutional family support: strong and universal in Social-democratic and Hybrid-continental regimes, moderate and market-based in Liberal regimes, often pronatalist in Post-communist regimes, and limited in Southern regimes. These patterns align well with theoretical expectations (Esping-Andersen, 1990; Matysiak & Vignoli, 2008) and previous research showing that institutional family support plays a key role in shaping fertility behavior (Badolato et al., 2024).

To answer RQ3 (whether the association between climate worry and fertility behavior differs across welfare regime types), the interaction models (Model 3) reveal no significant evidence that welfare regimes moderate the relationship between climate worry and fertility behavior. That is, climate worry affects fertility in a similar way regardless of institutional context. This suggests that while welfare institutions are linked to general fertility behavior, they do not strongly change how climate worry influences reproductive choices, the contrary to H4.

Climate-related fertility considerations may be shaped less by institutional family support and more by individual-level values and beliefs.

The findings have several theoretical implications. They suggest that while climate worry may be part of broader fertility-related considerations, it remains secondary to key structural determinants such as age, education, gender, and welfare context. They also reinforce the importance of a life-course perspective (Elder, 1998), highlighting that attitudes may be relevant at specific stages but are not consistently influential throughout the life course. From an institutional perspective, while welfare regimes shape fertility behavior, they do not substantially shape the role that climate worry plays within it.

Although climate worry does not significantly interact with welfare regimes, the results clearly show that welfare institutions do shape overall fertility behavior. This reflects the importance of supportive family policies for encouraging parenthood. Policymakers should take into account that welfare contexts influence fertility decisions and that climate anxiety, even if secondary, may increasingly affect reproductive choices – particularly during the key reproductive years, when individuals actively make family formation decisions. Policies that combine family support with environmental security may help reduce uncertainty around future life conditions and support informed and confident fertility decisions..

In summary, the findings indicate that climate worry is modestly associated with lower fertility during the main reproductive years, but its explanatory power remains limited compared to demographic and institutional factors. Welfare regimes strongly shape overall fertility behavior, but they do not meaningfully alter the association between climate worry and fertility. Climate worry appears to be one among several considerations in reproductive decision-making, but it does not fundamentally reshape fertility patterns in contemporary Europe.

7.1. Limitations

This study has some limitations, and the results should therefore be interpreted with caution. The most important limiation is that the ESS data are cross-sectional rather than longitudinal and no retrospective information is available. This design makes it impossible to know whether climate worry, education level, or political orientation came before or after fertility decisions.

In addition, the dependent variable is cumulative: it records how many children respondents have at the time of the survey, but not when these children were born. As a result, individual fertility timing cannot be observed. For respondents under age 40, family formation may still be incomplete, meaning that differences in parenthood across younger age groups may partly reflect postponement rather than final fertility outcomes. These issues are closely linked to

fertility postponement and tempo effects, which can shift period-based fertility patterns. Because countries are at different stages of postponement, and the timing of births is unknown in the data, it is difficult to tell whether the observed differences reflect actual completed fertility or simply different degrees of postponement across groups or countries. Tempo effects therefore remain an important methodological limitation when interpreting age-specific results.

The models capture statistical associations, but they do not establish causality. Since current attitudes are compared with past fertility behavior, we cannot be sure that the reported level of climate worry reflects what individuals felt when they actually made their childbearing decisions. It is possible that individuals developed their climate worry after they had made or completed childbearing decisions, particularly among older adults. Therefore, the findings should be interpreted as associations rather than causal effects.

Additionally, because attitudes cannot be measured directly, the survey relies on what respondents claim they feel about, e.g., the environment. As a result, the data may be subject to methodological limitations and reporting bias (as highlighted in Chapter 2.2).

Another limitation relates to the measurement of fertility. The study focuses on actual fertility realizations but does not include fertility intentions or preferred timing of childbearing. This means it cannot show whether climate worry is linked to postponing parenthood, future fertility plans, or desired family size.

The fertility measures (*everhadchildren, numberofchildren*) are based on household-level information. The question used to assess childbearing focuses on whether individuals have ever had children living in the same household. The *numberofchildren* variable was constructed by counting the number of children identified in the ”relationship to respondent” items. However, this approach does not account for children who live elsewhere, such as adult children who have moved out. As a result, 4.97% of respondents reported having had children while the constructed numberofchildren variable recorded zero. The opposite discrepancy (reporting no children while at least one was recorded in the household) was very rare, affecting only 0.06% of the sample. These inconsistencies indicate that household-based fertility measures may not fully capture respondents’ true number of children, particularly when some children live outside the household.

Although the sample includes 19 European countries that participated in all selected waves, generalizability is limited, particularly in smaller countries with fewer survey participants. The ESS includes only European countries, and the results cannot necessarily be extended to non-European or non-Western contexts where fertility norms, family policies, and environmental attitudes may differ.

Taken together, these limitations not only caution against overgeneralization but also offer direction for future studies seeking deeper and more accurate insights.

7.2. Future Research and Recommendations

Future research should build on these results by using longitudinal data to better understand how climate worry and fertility behavior develop over time. Following the same individuals in panel studies would make it possible to see whether climate worry comes before fertility decisions or develops afterwards, and how attitudes change as people move through different life stages.

Because this study shows that associations are mainly visible during the main childbearing years, future research should focus more on life-course dynamics and explore whether and under which conditions climate worry becomes relevant for fertility choices.

It would also be useful to include measures of fertility intentions and desired timing of parenthood. This would help researchers see whether climate worry influences future fertility plans, postponement of childbearing, or intended rather than only completed fertility.

Further studies could also expand the geographical context beyond Europe, since fertility behavior, family policies, and environmental attitudes may differ in other regions.

Finally, instead of relying on broad welfare regime categories, future studies could analyze specific family and environmental policies to better understand how they shape fertility under rising environmental uncertainity.

8. CONCLUSION

This thesis explored whether climate worry is associated with fertility behavior in Europe and whether this relationship varies across life-course stages and institutional contexts. Rather than focusing only on whether people have children, it also examined differences in family size, offering a broader perspective of fertility behavior. The analysis aimed to understand whether environmental attitudes play a meaningful role in reproductive behavior, alongside demographic, socioeconomic, and institutional factors.

The results show that climate worry is modestly associated with lower fertility among individuals in the main reproductive years (ages 25-34). No significant associations were found among younger or older individuals, suggesting that climate worry becomes relevant only when individuals are actively facing parenthood decisions.

A central finding of this research is that sociodemographic factors (particularly age, gender, and education level) are significantly stronger predictors of fertility behavior than attitudinal factors such as climate worry and political orientation. These structural factors show consistent and robust associations across models, while attitudinal variables display smaller and more context-specific effects. Education and gender, in particular, show clear life-course patterns, shaping both the timing and likelihood of parenthood more strongly than climate-related attitudes.

Institutional context also plays a clear role in shaping fertility outcomes. Individuals living in Social-democratic, Hybrid-continental, Liberal, and Post-communist regimes are generally more likely to have children, while those in Southern regimes are less likely, compared to people in Conservative regimes. These patterns align with contrasts in family-policy environments: Social-democratic, Hybrid-continental, Liberal, and Post-communist regimes tend to provide more institutional support for combining work and family, whereas Southern regimes remain least supportive. However, there is no evidence that welfare regimes change how climate worry relates to fertility, indicating that while institutions shape fertility behavior overall, they do not determine the link between climate worry and fertility.

These findings suggest that while climate worry may play some role in childbearing decisions, it remains secondary to demographic, socioeconomic, and institutional determinants of fertility. Climate worry appears to be one of several considerations in reproductive decision-making, but it does not fundamentally reshape fertility patterns in Europe. From a life-course perspective, attitudes seem to matter most during the active decision-making phase of family formation rather than across the entire reproductive life span.

In summary, the findings show that climate worry adds only limited explanatory power to models of fertility outcomes. More traditional factors (many of which could not be fully accounted for here, such as employment conditions or childcare provision) likely play a far larger role in shaping fertility patterns in Europe.

9. APPENDICES

Appendix A: Abstract in English

Europe is facing two powerful demographic and environmental trends: increasing climate anxiety and record-low fertility rates. But are these trends connected?

This thesis examines whether climate worry is associated with fertility behavior in Europe, focusing on both the transition to parenthood and variation in family size. Using cross-sectional data from three waves of the European Social Survey (8, 10, and 11) covering 19 countries, logistic and multinomial regression analyses were conducted to examine whether climate worry relates to fertility outcomes, and whether this relationship varies by life-course stage or welfare regime context. The findings show that higher levels of climate worry are modestly associated with lower likelihoods of having had children and smaller family sizes, but only among individuals aged 25-34, suggesting that climate worry may be most relevant during active childbearing years. However, sociodemographic factors – particularly age, gender, and education level – are much stronger predictors of fertility behavior than attitudinal factors such as climate worry or political orientation. While welfare regimes clearly shape overall fertility patterns, they do not appear to change the relationship between climate worry and fertility.

Overall, the findings suggest that while climate worry plays a role in reproductive decision-making, it remains secondary to demographic, socioeconomic, and institutional determinants of fertility in contemporary Europe.

Statement on the use of AI:

AI tools, specifically ChatGPT and Claude, were used during the preparation of this thesis. They were used for solving technical problems in R, including the creation of regression models, provided language-related help, such as grammar-checking, spelling, and phrasing suggestions. Additionally, they supported citation formatting and addressed questions related to APA 7th edition guidelines.

Appendix B: Abstract in German

Europa steht vor zwei bedeutenden demografischen und ökologischen Herausforderungen: zunehmender Klimaangst und historisch niedrigen Fertilitätsraten. Doch sind diese Entwicklungen miteinander verknüpft?

Diese Arbeit untersucht, ob Klimasorge mit dem Fertilitätsverhalten in Europa zusammenhängt und betrachtet dabei sowohl den Übergang zur Elternschaft, als auch Unterschiede in der Familiengröße. Auf Grundlage von Querschnittsdaten aus drei Wellen des European Social Survey (Runden 8, 10 und 11) in 19 Ländern wurden logistische und multinomiale Regressionsanalysen durchgeführt, um zu prüfen, ob Klimasorge mit Fertilitätsergebnissen zusammenhängt und ob dieser Zusammenhang – je nach Lebensphase oder Wohlfahrtsregimetyp – variiert. Die Ergebnisse zeigen: Höhere Ausprägungen von Klimasorge sind moderat mit einer geringeren Wahrscheinlichkeit, Kinder zu haben, sowie mit kleineren Familiengrößen verbunden – allerdings nur bei Personen im Alter von 25 bis 34 Jahren. Dies deutet darauf hin, dass Klimasorge insbesondere in der aktiven Phase der Familiengründung eine Rolle spielen könnte. Gleichzeitig erweisen sich soziodemografische Faktoren – insbesondere Alter, Geschlecht und Bildung – als deutlich stärkere Prädiktoren des Fertilitätsverhaltens als Einstellungskomponenten wie Klimasorge oder politische Orientierung. Während Wohlfahrtsregime das allgemeine Fertilitätsniveau klar beeinflussen, verändern sie die Beziehung zwischen Klimasorge und Fertilität nicht.

Insgesamt legen die Ergebnisse nahe, dass Klimasorge zwar eine gewisse Rolle bei reproduktiven Entscheidungen spielt, jedoch gegenüber demografischen, sozioökonomischen und institutionellen Determinanten der Fertilität im heutigen Europa nachrangig bleibt.

Appendix C: List of Figures

Figure 1: Belief about the Causes of Climate Change by Age Group and Welfare Model 36

Figure 2: Climate Worry Level by Age Group and Welfare Model 37

Figure 3: Preceived Responsibility to Reduce Climate Change by Age Group and Welfare Model 38

Figure 4: Distribution of Number of Children by Climate Worry Level and Welfare Model 39

Figure 5: Distribution of Number of Children by Precieved Responsibility to Reduce Climate Change and Welfare Model 40

Figure 6: Climate Worry Level by Belief about the Causes of Climate Change, Faceted by Responsibility 41

Figure 7: Average Marginal Effects (Model 4) 58

Figure 8: Average Marginal Effects – Age Group 25-34 (Model 5.2) 64

Figure 9: Belief about the Causes of Climate Change by Age Group and Country 77

Figure 10: Climate Worry Level by Age Group and Country 78

Figure 11: Preceived Responsibility to Reduce Climate Change by Age Group and Country 78

Figure 12: Distribution of Number of Children by Climate Worry Level and Country 79

Figure 13: Distribution of Number of Children by Precieved Responsibility to Reduce Climate Change and Country 79

Appendix D: List of Tables

Table 1: Descriptive Statistics – Survey-Weighted Estimates 35

Table 2: Results of Logistic Regression – Baseline Model (Model 1) 45

Table 3: Results of Logistic Regression – Age Group Models (Model 2) 48

Table 4: Results of Logistic Regression – Interaction Models (Model 3) 54

Table 5: Results of Multinomial Regression – Baseline Model (Model 4) 57

Table 6: Results of Multinomial Regression – Age Group Models (Model 5) 63

Table 7: Descriptive Statistics – Additional Variables Used in Robustness Checks 80

Table 8: Robusntess Check Models for the Logistic Regression Analysis (Model 6) 81

Table 9: Robusntess Check Model for the Multinomial Regression Analysis: Full Sample (Model 7.1) 82

Table 10: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample (Model 7.2) 83

Table 11: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Self-Rated Health (Model 7.3) 84

Table 12: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Marital Status (Model 7.4) 85

Table 13: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Religion (Model 7.5) 86

Table 14: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Net Income (Model 7.6) 87

Appendix E: Descriptive Results

Appendix E presents the same graphs as Figures 1-5 from the descriptive analysis. However, instead of displaying the results by welfare regime, the figures here are visualized at the country level. This allows for a more detailed comparison across individual countries and highlights national-level patterns that may be less visible when grouped by broader welfare regimes.

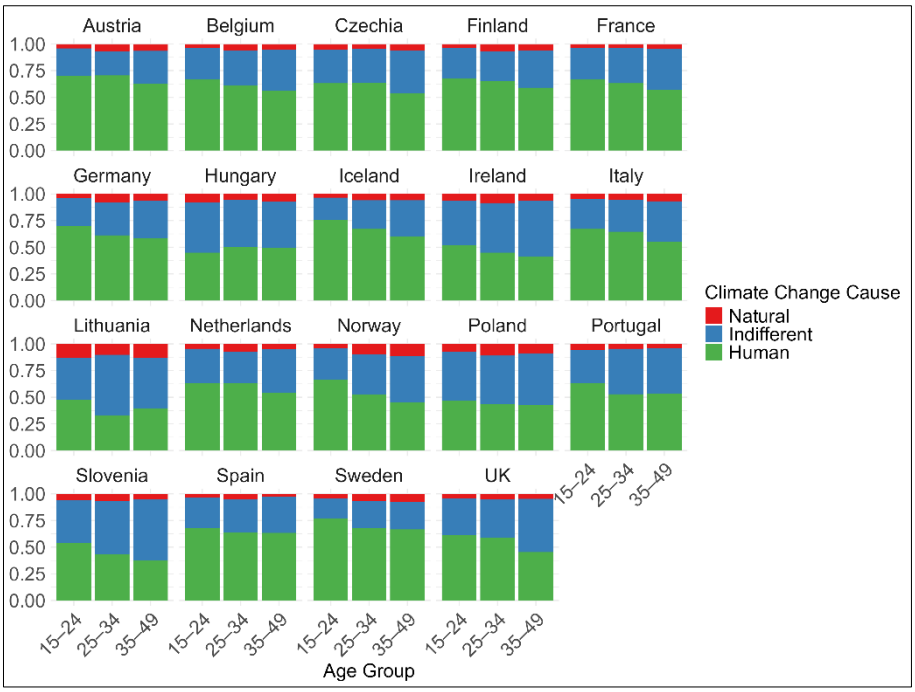

Figure 9: Belief about the Causes of Climate Change by Age Group and Country

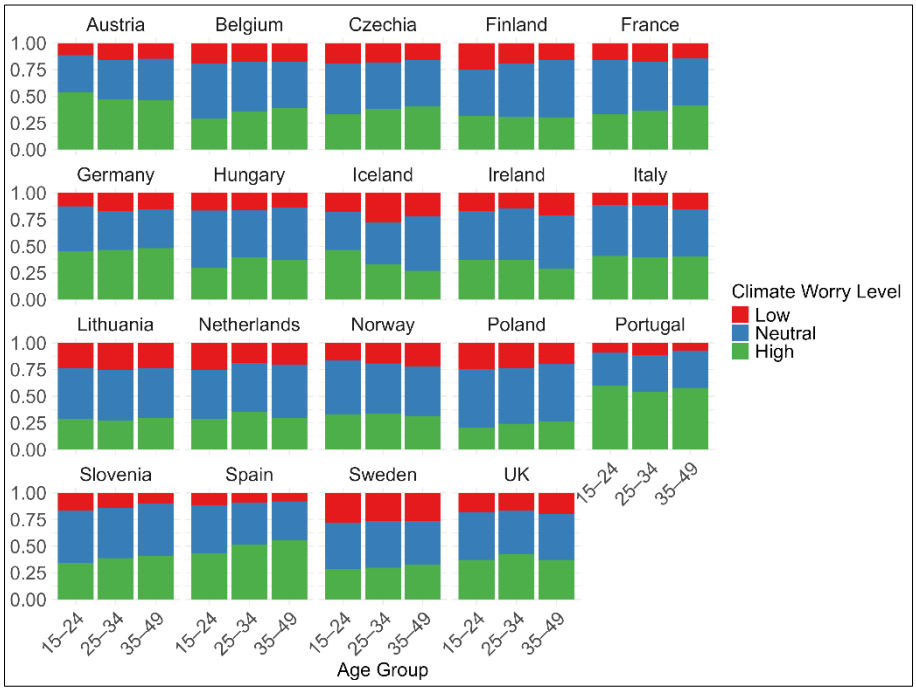

Figure 10: Climate Worry Level by Age Group and Country

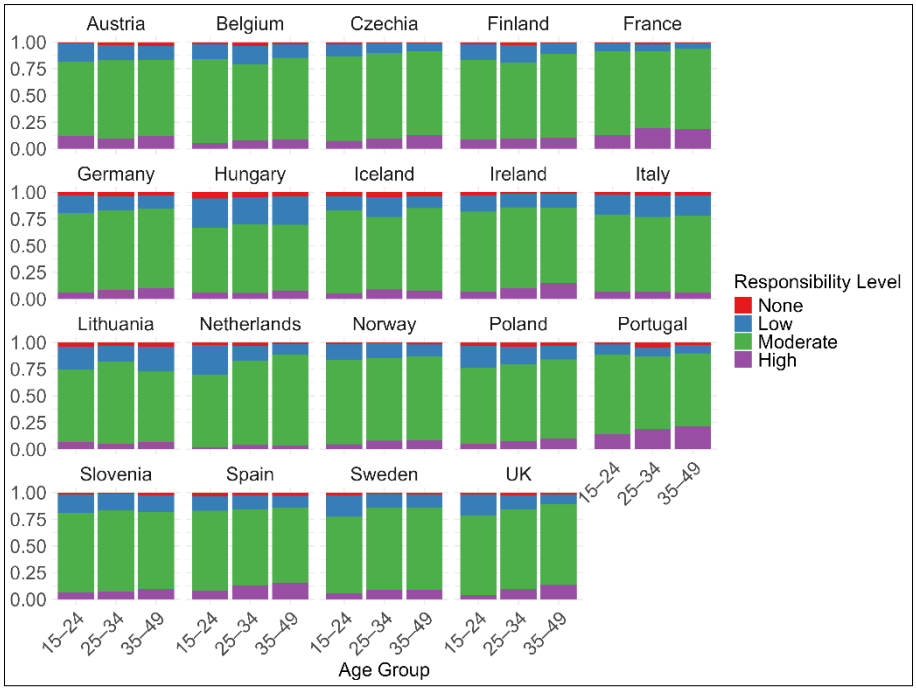

Figure 11: Preceived Responsibility to Reduce Climate Change by Age Group and Country

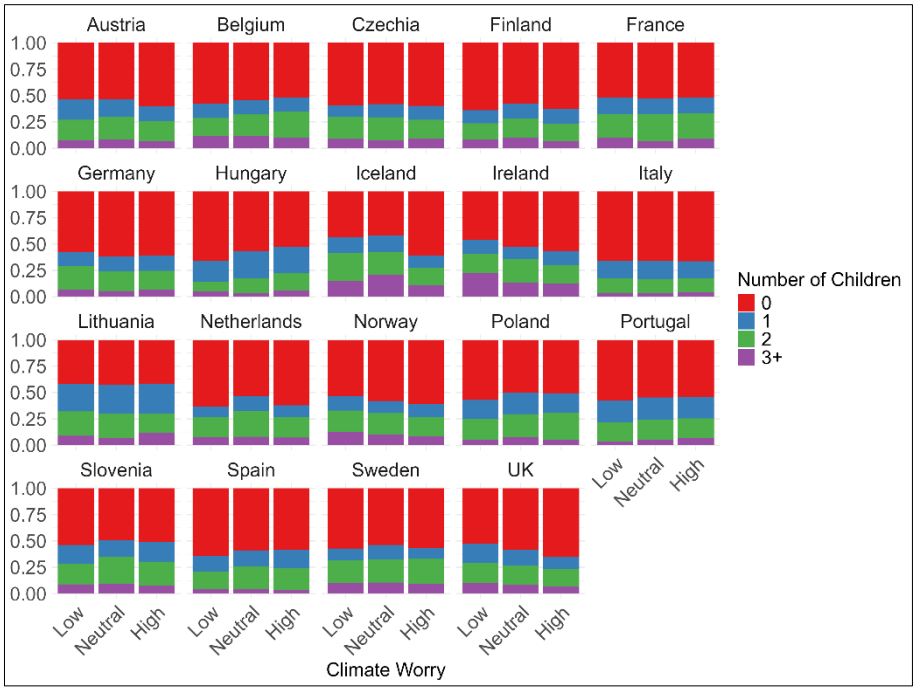

Figure 12: Distribution of Number of Children by Climate Worry Level and Country

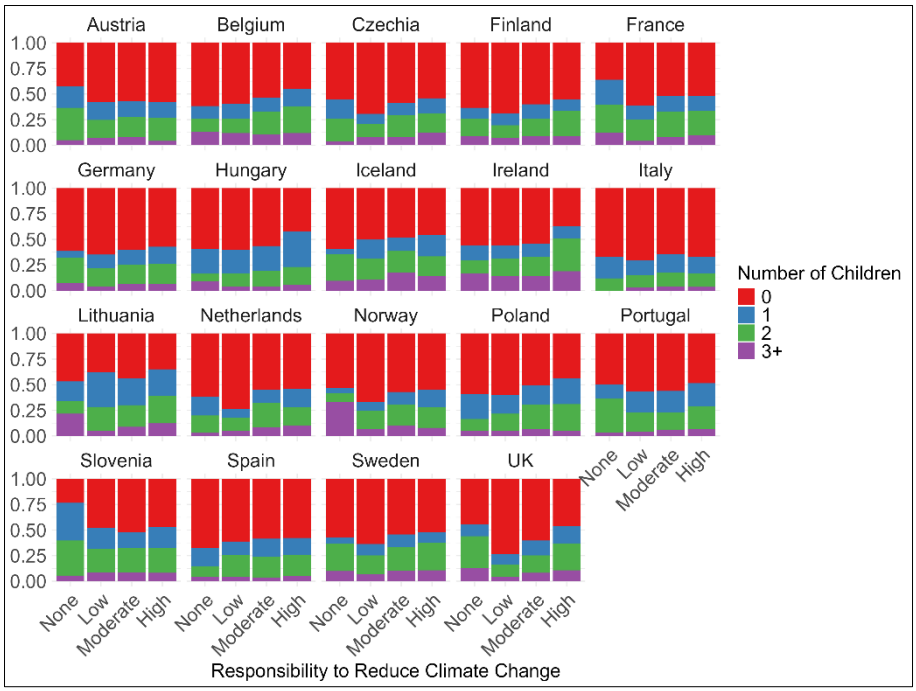

Figure 13: Distribution of Number of Children by Precieved Responsibility to Reduce Climate Change and Country

Appendix F: Robustness Checks

Appendix F provides robustness checks for both the logistic and multinomial regression analyses. Table 7 includes descriptive statistics for the additional variables used in the sensitivity models. Table 8 displays the robustness checks side by side for the logistic regression. Tables 9-14 contain the separate sensitivity models for the multinomial regression analysis.

Variable	Overall	Conservative	Social-democratic	Hybrid-continental	Liberal	Southern	Post-communist
Self-Rated Health							
Poor	2,123 (4.1%)	701 (6.4%)	113 (4.1%)	433 (4.0%)	372 (3.8%)	325 (2.7%)	179 (2.8%)
Fair	9,296 (18%)	2,347 (22%)	408 (15%)	1,964 (18%)	1,564 (16%)	2,077 (17%)	936 (15%)
Good	40,989 (78%)	7,833 (72%)	2,197 (81%)	8,331 (78%)	7,960 (80%)	9,482 (80%)	5,186 (82%)
Marital Status							
Legally married	706 (2.5%)	73 (1.5%)	21 (1.3%)	118 (1.7%)	256 (4.2%)	166 (2.6%)	71 (2.7%)
Registered civil union	257 (0.9%)	12 (0.3%)	20 (1.2%)	86 (1.2%)	76 (1.2%)	58 (0.9%)	5 (0.2%)
Legally separated	201 (0.7%)	0 (0%)	5 (0.3%)	11 (0.2%)	26 (0.4%)	143 (2.2%)	16 (0.6%)
Divorced/Union dissolved	1,951 (6.9%)	310 (6.5%)	120 (7.6%)	578 (8.3%)	369 (6.0%)	332 (5.2%)	242 (9.2%)
Widowed/Partner died	173 (0.6%)	22 (0.5%)	11 (0.7%)	32 (0.5%)	46 (0.8%)	23 (0.4%)	38 (1.4%)
Never married	25,190 (88%)	4,340 (91%)	1,417 (89%)	6,128 (88%)	5,364 (87%)	5,681 (89%)	2,261 (86%)
Unknown	23,929	6,124	1,123	3,775	3,759	5,480	3,668
Religious							
No	23,217 (52%)	3,617 (48%)	1,434 (64%)	6,552 (61%)	6,005 (61%)	3,954 (40%)	1,654 (34%)
Yes	21,864 (48%)	3,921 (52%)	799 (36%)	4,123 (39%)	3,865 (39%)	5,974 (60%)	3,180 (66%)
Unknown	7,327	3,342	484	53	26	1,956	1,466
Net Income (Decile)							
1	2,472 (5.8%)	639 (7.1%)	191 (7.5%)	559 (5.9%)	437 (5.4%)	480 (5.4%)	166 (3.5%)
2	3,011 (7.0%)	586 (6.5%)	127 (5.0%)	589 (6.2%)	563 (6.9%)	871 (9.8%)	276 (5.8%)
3	3,476 (8.1%)	667 (7.4%)	165 (6.5%)	620 (6.5%)	556 (6.8%)	1,107 (12%)	361 (7.6%)
4	3,877 (9.0%)	727 (8.0%)	191 (7.5%)	835 (8.8%)	605 (7.5%)	1,044 (12%)	474 (10.0%)
5	4,334 (10%)	789 (8.7%)	222 (8.7%)	957 (10%)	797 (9.8%)	1,055 (12%)	515 (11%)
6	4,309 (10%)	936 (10%)	266 (10%)	889 (9.4%)	645 (7.9%)	1,009 (11%)	563 (12%)
7	5,372 (13%)	1,073 (12%)	374 (15%)	1,312 (14%)	930 (11%)	1,069 (12%)	613 (13%)
8	5,526 (13%)	1,262 (14%)	335 (13%)	1,292 (14%)	1,061 (13%)	959 (11%)	617 (13%)
9	4,979 (12%)	1,222 (14%)	365 (14%)	1,145 (12%)	982 (12%)	748 (8.4%)	517 (11%)
10	5,508 (13%)	1,135 (13%)	313 (12%)	1,277 (13%)	1,544 (19%)	584 (6.5%)	654 (14%)
Unknown	9,544	1,844	169	1,254	1,777	2,958	1,543

Table 7: Descriptive Statistics – Additional Variables Used in Robustness Checks

	Model 6.1 (original sample)	Model 6.2 (non-missing sample)	Model 6.3 (non-missing sample + health)	Model 6.4 (non-missing sample + marital status)	Model 6.5 (non-missing sample + religion)	Model 6.6 (non-missing sample + net income)
Predictors	**Odds Ratios**[1]	**Odds Ratios**[1]	**Odds Ratios**[1]	**Odds Ratios**[1]	**Odds Ratios**[1]	**Odds Ratios**[1]
Climate Worry						
Neutral	—	—	—	—	—	—
Low	1.02	1.12	1.12	1.12	1.12	1.12
High	**0.84*** **	**0.79*** **	**0.79*** **	**0.79*** **	**0.79*** **	**0.79*** **
Age Group						
25–34	—	—	—	—	—	—
15–24	**0.07*** **	**0.12*** **	**0.12*** **	**0.14*** **	**0.12*** **	**0.12*** **
35–49	**7.04*** **	**5.42*** **	**5.44*** **	**4.02*** **	**5.43*** **	**5.50*** **
Gender						
Male	—	—	—	—	—	—
Female	**1.74*** **	**2.51*** **	**2.51*** **	**2.28*** **	**2.51*** **	**2.57*** **
Education Level						
Medium	—	—	—	—	—	—
Low	**1.13***	1.10	1.11	1.09	1.10	1.15
High	**0.65*** **	**0.44*** **	**0.44*** **	**0.44*** **	**0.44*** **	**0.43*** **
Political Orientation						
Center	—	—	—	—	—	—
Left	**0.71*** **	**0.67*** **	**0.67*** **	**0.72*** **	**0.67*** **	**0.67*** **
Right	0.98	**0.85***	**0.85***	**0.83** **	**0.86***	**0.85***
Welfare Model						
Conservative	—	—	—	—	—	—
Social-democratic	**1.31*** **	**1.75*** **	**1.74*** **	**1.72*** **	**1.74*** **	**1.74*** **
Hybrid-continental	**1.41*** **	**1.76*** **	**1.75*** **	**1.70*** **	**1.75*** **	**1.74*** **
Liberal	**1.31** **	**1.67*** **	**1.66*** **	**1.51*** **	**1.66*** **	**1.68*** **
Southern	**0.64*** **	**0.66*** **	**0.66*** **	**0.62*** **	**0.67*** **	**0.65*** **
Post-communist	**1.27*** **	1.01	1.01	0.88	1.02	1.00
Self-Rated Health						
Fair			—			
Good			0.98			
Poor			0.90			
Marital Status						
Legally married				—		
Registered civil union				**0.37*** **		
Legally separated				0.68		
Divorced/Union dissolved				0.74		
Widowed/Partner died				**0.23*** **		
Never married				**0.13*** **		
Religious						
No					—	
Yes					0.97	
Net Income (Decile)						
5						—
1						**0.70** **
2						1.10
3						0.84
4						0.90
6						1.12
7						1.28
8						**1.29***
9						1.06
10						0.88

[1] *p<0.05; **p<0.01; ***p<0.001

N: M6.1 = 42,408; M6.2-M6.6 = 17,754

AIC/BIC: M6.1 = 38527.42/38621.56; M6.2 = 14949.75/15040.37; M6.3 = 14959.78/15058.83; M6.4 = 14121.91/14234.08; M6.5 = 14953.18/15049.55; M6.6 = 14921.55/15053.07

Table 8: Robusntess Check Models for the Logistic Regression Analysis (Model 6)

Note: All models control for ESS wave effects.

Predictors	Odds Ratios (Child = 1)[1]	Odds Ratios (Child = 2)[1]	Odds Ratios (Child = 3)[1]
Climate Worry			
Neutral	—	—	—
Low	0.99	0.95	1.04
High	**0.85****	**0.86****	0.91
Age Group			
25–34	—	—	—
15–24	**0.09*****	**0.06*****	**0.03*****
35–49	**3.45*****	**7.64*****	**8.53*****
Gender			
Male	—	—	—
Female	**1.84*****	**1.77*****	**1.91*****
Education Level			
Medium	—	—	—
Low	0.94	0.95	**1.78*****
High	**0.73*****	**0.78*****	**0.76****
Political Orientation			
Center	—	—	—
Left	**0.77*****	**0.76*****	**0.61*****
Right	0.95	1.02	0.98
Welfare Model			
Conservative	—	—	—
Social-democratic	1.05	**1.36*****	**2.08*****
Hybrid-continental	1.22	**1.63*****	**1.78*****
Liberal	1.16	1.15	**1.65****
Southern	0.95	**0.69*****	**0.43*****
Post-communist	**1.41*****	**1.18***	1.10

[1] *p<0.05; **p<0.01; ***p<0.001

N = 42,408

AIC/BIC: 93375.07/93816.47

Table 9: Robusntess Check Model for the Multinomial Regression Analysis: Full Sample (Model 7.1)

Notes: The model controls for ESS wave effects. „Child = 3" indicates three or more children.

Predictors	Odds Ratios (Child = 1)[1]	Odds Ratios (Child = 2)[1]	Odds Ratios (Child = 3)[1]
Climate Worry			
Neutral	—	—	—
Low	1.21	1.00	0.97
High	0.85	0.85	0.91
Age Group			
25–34	—	—	—
15–24	**0.16*** **	**0.12*** **	**0.05*** **
35–49	**3.22*** **	**4.78*** **	**5.56*** **
Gender			
Male	—	—	—
Female	**2.86*** **	**3.27*** **	**3.66*** **
Education Level			
Medium	—	—	—
Low	1.00	1.14	**1.76** **
High	**0.49*** **	**0.49*** **	**0.38*** **
Political Orientation			
Center	—	—	—
Left	**0.82** **	**0.66*** **	**0.52** **
Right	0.90	**0.81***	0.96
Welfare Model			
Conservative	—	—	—
Social-democratic	1.20	**2.31*** **	**5.19*** **
Hybrid-continental	**1.37** **	**2.40*** **	**4.26*** **
Liberal	1.14	1.31	**5.63*** **
Southern	**0.74***	**0.72***	1.05
Post-communist	0.98	0.81	1.69

[1] *p<0.05; **p<0.01; ***p<0.001

N = 17,754

AIC/BIC: 27995.97/28392.97

Table 10: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample (Model 7.2)

Notes: The model controls for ESS wave effects. „Child = 3" indicates three or more children.

Predictors	Odds Ratios (Child = 1)[1]	Odds Ratios (Child = 2)[1]	Odds Ratios (Child = 3)[1]
Climate Worry			
Neutral	—	—	—
Low	1.21	1.00	0.97
High	0.85	0.85	0.91
Age Group			
25–34	—	—	—
15–24	**0.15*** **	**0.12*** **	**0.05*** **
35–49	**3.25*** **	**4.89*** **	**5.61*** **
Gender			
Male	—	—	—
Female	**2.88*** **	**3.33*** **	**3.68*** **
Education Level			
Medium	—	—	—
Low	1.01	1.18	**1.79** **
High	**0.49*** **	**0.49*** **	**0.37*** **
Political Orientation			
Center	—	—	—
Left	**0.81** **	**0.66*** **	**0.53** **
Right	0.90	**0.81***	0.97
Welfare Model			
Conservative	—	—	—
Social-democratic	1.19	**2.27*** **	**5.15*** **
Hybrid-continental	**1.37** **	**2.36*** **	**4.22*** **
Liberal	1.14	1.28	**5.57*** **
Southern	**0.73***	**0.69***	1.04
Post-communist	0.97	0.78	1.66
Self-Rated Health			
Fair	—	—	—
Good	0.91	1.01	1.15
Poor	0.69	**0.62***	0.98

[1] *p<0.05; **p<0.01; ***p<0.001

N = 17,754

AIC/BIC: 27982.55/28426.25

Table 11: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Self-Rated Health (Model 7.3)

Notes: The model controls for ESS wave effects. „Child = 3" indicates three or more children.

Predictors	Odds Ratios (Child = 1)[1]	Odds Ratios (Child = 2)[1]	Odds Ratios (Child = 3)[1]
Climate Worry			
Neutral	—	—	—
Low	1.22	1.00	0.97
High	0.85	0.85	0.91
Age Group			
25–34	—	—	—
15–24	**0.17*** **	**0.14*** **	**0.06*** **
35–49	**2.64*** **	**4.06*** **	**4.37*** **
Gender			
Male	—	—	—
Female	**2.69*** **	**3.11*** **	**3.35*** **
Education Level			
Medium	—	—	—
Low	0.99	1.13	**1.72****
High	**0.50*** **	**0.50*** **	**0.38*** **
Political Orientation			
Center	—	—	—
Left	**0.84***	**0.68*** **	**0.56***
Right	0.87	**0.79***	0.94
Welfare Model			
Conservative	—	—	—
Social-democratic	1.18	**2.25*** **	**5.12*** **
Hybrid-continental	**1.34***	**2.32*** **	**4.14*** **
Liberal	1.10	1.24	**4.97*** **
Southern	**0.72***	**0.70***	1.02
Post-communist	0.92	0.77	1.53
Marital Status			
Legally married	—	—	—
Registered civil union	1.15	2.04	1.02
Legally separated	**1.91***	1.33	0.69
Divorced/Union dissolved	**1.58***	1.30	0.75
Widowed/Partner died	0.82	0.75	0.57
Never married	**0.64****	**0.58***	**0.28*** **

[1] *p<0.05; **p<0.01; ***p<0.001

N = 17,754

AIC/BIC: 27695.93/28209.7

Table 12: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Marital Status (Model 7.4)

Notes: The model controls for ESS wave effects. „Child = 3" indicates three or more children.

Predictors	Odds Ratios (Child = 1)[1]	Odds Ratios (Child = 2)[1]	Odds Ratios (Child = 3)[1]
Climate Worry			
Neutral	—	—	—
Low	1.21	1.00	0.99
High	0.84	0.85	0.92
Age Group			
25–34	—	—	—
15–24	**0.16*** **	**0.13*** **	**0.05*** **
35–49	**3.24*** **	**4.79*** **	**5.39*** **
Gender			
Male	—	—	—
Female	**2.90*** **	**3.29*** **	**3.59*** **
Education Level			
Medium	—	—	—
Low	1.01	1.15	**1.74** **
High	**0.49*** **	**0.49*** **	**0.37*** **
Political Orientation			
Center	—	—	—
Left	**0.81** **	**0.66*** **	**0.54** **
Right	0.91	**0.81***	0.94
Welfare Model			
Conservative	—	—	—
Social-democratic	1.18	**2.29*** **	**5.36*** **
Hybrid-continental	**1.35***	**2.39*** **	**4.37*** **
Liberal	1.12	1.31	**5.82*** **
Southern	**0.76***	**0.72***	0.98
Post-communist	1.01	0.82	1.58
Religious			
No	—	—	—
Yes	**0.84***	0.94	**1.48***

[1] *p<0.05; **p<0.01; ***p<0.001

N = 17,754

AIC/BIC: 27959.03/28379.39

Table 13: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Religion (Model 7.5)

Notes: The model controls for ESS wave effects. „Child = 3" indicates three or more children.

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Predictors	Odds Ratios (Child = 1)[1]	Odds Ratios (Child = 2)[1]	Odds Ratios (Child = 3)[1]
Climate Worry			
Neutral	—	—	—
Low	1.21	1.01	0.99
High	0.85	0.85	0.92
Age Group			
25–34	—	—	—
15–24	**0.15*** **	**0.11*** **	**0.05*** **
35–49	**3.28*** **	**4.88*** **	**5.51*** **
Gender			
Male	—	—	—
Female	**2.95*** **	**3.48*** **	**3.77*** **
Education Level			
Medium	—	—	—
Low	1.07	**1.27***	**1.80****
High	**0.47*** **	**0.45*** **	**0.32*** **
Political Orientation			
Center	—	—	—
Left	**0.81****	**0.65*** **	**0.54****
Right	0.88	**0.78****	0.96
Welfare Model			
Conservative	—	—	—
Social-democratic	1.19	**2.28*** **	**5.21*** **
Hybrid-continental	**1.35***	**2.38*** **	**4.25*** **
Liberal	1.15	1.32	**5.43*** **
Southern	**0.72***	**0.70***	1.10
Post-communist	0.95	0.80	**1.73***
Net Income (Decile)			
5	—	—	—
1	**0.51*** **	**0.52*** **	0.98
2	1.06	1.03	1.25
3	0.80	0.81	0.90
4	1.00	0.90	0.87
6	1.05	**1.32***	1.21
7	1.22	**1.46****	1.01
8	**1.33***	**1.55***	1.09
9	0.98	1.22	1.28
10	0.77	1.03	**2.16***

[1] *p<0.05; **p<0.01; ***p<0.001

N = 17,754

AIC/BIC: 27823.97/28431.15

Table 14: Robusntess Check Model for the Multinomial Regression Analysis: Non-missing Sample + Net Income (Model 7.6)

Notes: The model controls for ESS wave effects. „Child = 3" indicates three or more children.

Appendix G: Summary of Research Questions, Hypotheses, and Findings

Research Question	Hypothesis	Statement	Supported?	Summary of key findings
RQ1: Is climate worry associated with the likelihood of (a) having ever had children and with (b) the number of children individuals have?	**H1**	Higher levels of climate worry are associated with a lower likelihood of having ever had children.	Partially supported	Climate worry is associated with lower odds of parenthood, but only among individuals aged 25-34. No significant associations for 15-24 or 35-49.
	H2	Higher levels of climate worry are associated with a lower likelihood of having multiple children (compared to having no children).	Partially supported	Climate worry is associated with smaller family sizes, but only in the 25-34 age group; effects are modest and absent in younger and older age groups.
RQ2: Does the association between climate worry and fertility behavior differ across life-course stages?	**H3**	The association between climate worry and fertility behavior is strongest during the main reproductive years (25-34).	Supported	Climate worry shows significant associations only in the main childbearing years (25-34). Education, political orientation, and gender also show strongest effects during this stage.
RQ3: Does the association between climate worry and fertility behavior differ across European welfare regime types?	**H4**	In family-supportive welfare regimes, the association between climate worry and fertility is weaker.	Not supported	No significant interaction between climate worry and welfare regime type. The association does not differ across regimes.

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