GÖTEBORGS UNIVERSITET

THE NUCLEAR POWER AMBIGUITY:

The role of ideology in the relationship between worries about changes in the earth's climate and support for nuclear power.

Emil Berglind

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Abstract

This study seeks to expand upon current literature on the relationship between worries about the climate and the support for nuclear power. Previous research has established a negative correlation between the two, but public opinion research from Sweden proves that nuclear power can gain support, while worries about the climate remain on the same level. Nuclear power is a difficult subject among individuals who are worried about climate change since nuclear power does not emit carbon dioxide but is not the favored choice of future energy sources. Solar- wind- and hydro energy sources are prefered among left-leaning individuals, while right-leaning individuals are more favorable toward nuclear power. In order to investigate why climate worries remain high and support for nuclear power goes up, the ideology was tested to see ideological differences toward nuclear power among individuals who are worried about changes in the earth's climate. Using cross-sectional data from the 2019 SOM-institute general questionnaire, an OLS-regression analysis was performed to empirically test the theory. The results confirmed the negative correlation between worries about the climate and support for nuclear power, but could not find support for ideological differences in the climate concerned group toward nuclear power.

Keywords: Worries about the climate, climate concern, nuclear power, energy sources, ideology.

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1. Introduction

As the planet gets warmer and warmer, to a point where many places may become impossible to live in, being worried about the climate is not a rare feeling. Under these conditions, the choice of energy sources becomes increasingly important. Which sources we choose to get energy from has started a debate between people who are for and against nuclear power and renewable "green" sources. According to previous research, people who express the most concern about the climate also have the least amount of support for nuclear power, while the ones who express the least concern about the climate also have the most support for nuclear power (Holmberg, 2019; Lim & Moon, 2021; Ertör-Akyazı et al, 2012). Even though the debate regarding future sources of energy remains, the collective worry about the climate is large among both left-leaning and right-leaning people in Sweden (Holmberg, 2019; Jönsson, 2020). This is important, since research has found that left-leaning voters have had greater worries about the climate as well as lower support for nuclear power (Gregersen et al, 2020: van der Linden 2017: McCright & Dunlap, 2013). However, among Swedish voters who consider themselves "clearly to the right", 70% answer that they feel very or rather worried about the climate (Jönsson, 2020). This is a puzzle, since the support for nuclear power is rising in Sweden, while worries about the climate remain equally high (Holmberg, 2019). Previous research has established a negative correlation between worries about the climate and support for nuclear power, but what happens when the individual's climate concerns are equally high while support for nuclear power goes up? The two might therefore not be opposites; a rising concern about the climate does not indicate that the support for nuclear power goes down. So why is there a difference in attitudes toward nuclear power among individuals with a high concern about the climate?

Worries about the climate are in large part caused by worsening conditions in the earth's climate (Coffey et al, 2021). Worries about the climate could also include fear of nuclear reactor meltdowns, nuclear waste storage, rising sea levels, melting glaciers, warming oceans, harm to animals caused by global warming, destruction of the places people live in as well as destruction of livelihood (World Wildlife Foundation). This study will focus on worries about the climate in regards to global warming and changes in the earth's climate. Worries and concerns about the climate as terms will be used interchangeably. Some argue that nuclear power is a good way to combat global warming (Lim & Moon, 2021; Ertör-Akyazı et al,

2012; Flynn, 1992), while some disagree (Verbruggen, 2008). Renewables and nuclear power have in large part been competing sources of energy, which has led to debates on how to reverse global warming and mitigate climate worries. In some nations, left-leaning governments are in favor of, and in some nations, right-leaning governments are against nuclear power, which complicates the ability to make generalizations in regards to nuclear related questions. Studies about how worries about the climate affect the view on nuclear power are relatively few. It is of importance to investigate the differences among climate concerned individuals and their stances on the future of energy policies, since it affects how future energy policy will be shaped.

An individual's ideology could help to explain the puzzle, the differences in attitudes toward the solutions to the global warming problem in which both groups (left and right), are concerned about. This study therefore proposes to examine ideology as a further explanation of the relationship between climate concerns and nuclear power. Left- and right-leaning individuals both gave a high degree of worry about the climate, but ideology is expected to explain the different ways these individuals want to mitigate these worries. In accordance with previous literature, left-leaning individuals have a high level of worry about the climate, which would indicate that a left-leaning ideology will have a negative impact on the correlation between climate worries and nuclear power. Since right-leaning individuals generally have a higher level of support for nuclear power, rightist-ideology is expected to decrease the negative correlation on said relationship. The research questions for this study are therefore; *does ideology affect the relationship between worries about the climate and support for nuclear power in Sweden? Does ideology explain the differences in attitudes toward nuclear power among climate concerned individuals?*

In order to examine the research questions and answer the study's hypotheses, an OLS-regression analysis model was set up using public opinion data from the SOM-institute. The results from the regression analysis confirmed the negative correlation between worries about the climate and support for nuclear power, but it did not show that neither left nor right-leaning ideology increased or decreased the relationship. This indicates that, in this study, ideology did not explain the difference in attitudes toward nuclear power among climate concerned individuals. The results rather point to changes on a societal level since ideology, interest in climate related questions and gender proved to make a significant impact.

2. Literature review

This section will contain an overview on the subject of climate concerns and the view on nuclear power. The question regarding nuclear power and its effect on the climate will be discussed as well as an introduction of ideology as a theoretical mechanism to explain the differences in attitudes toward nuclear power among climate concerned individuals.

2.1. Nuclear power and climate change

Since our worries about the climate in large part stem from a concern about global warming, it is important to discuss how one of the most used sources of energy, nuclear power, actually affects the climate. If worries about the climate are rising, support for nuclear power should decrease as previous literature has established a negative correlation between the two. But this might not be the case everywhere, since support for nuclear power is rising in Sweden while the worries remain the same. It is important to briefly discuss this relationship since nuclear power is, by some, used as a tool to combat climate change, while some argue against using nuclear power as a means to mitigate global warming and therefore our climate concerns.

On a macro-level, some nations want to solve these concerns by depending on nuclear power and see renewables as the best way to mitigate global warming. Some nations, such as Germany, will in 2022 be completely independent of nuclear power (Jordans, 2022). There is, for example, no EU consensus about the future use of nuclear power and renewable energies. The European nations are even divided on whether or not to call nuclear power a ´green´ source of energy (Deutsche Welle, 2021). Some literature argue that nuclear power is a good way to combat global warming, since it is a cleaner source of energy than fossil fuel, and does not release carbon dioxide directly into the atmosphere (Lim & Moon, 2021; Ertör-Akyazı et al, 2012; Flynn, 1992). Contrary to these papers, research from Verbruggen (2008) argues that nuclear power and renewable energy are very incompatible. This leads to him arguing that nuclear power is a bad way of mitigating global warming, since it builds on a "business-as-usual" mindset. If we do not change our ways of thinking about our energy consumption, global warming will be hard to combat according to Verbruggen.

2.2. *Worries about the climate and support for nuclear power*

In the following section I will discuss the current literature on the subject of climate concerns and its relationship with nuclear power. Numerous studies confirm that there is a negative correlation between worries about the climate and support for nuclear power. Holmberg (2019) points out that the people who express the most concern about the climate also have the least amount of support for nuclear power, while the ones who express the least concern about the climate also have the most support for nuclear power. The support for nuclear power is looked at through the lens of climate change in a cross-national European analysis from Pampel (2011). Pampel concluded that few respondents in the European Union "view climate change as a reason to expand nuclear energy" (Pampel, 2011, p. 262). Pampel writes that countries with an outspoken goal of combating climate change often have a lower amount of support for nuclear energy and higher support for renewable green energy. A study from Wang and Kim (2018) points out that "(...) those who are more concerned about the environment tend to believe that there is a higher risk of meltdown from nuclear power" (Wang & Kim, 2018, p. 1518). Sonnberger et al (2021) also find support for the assumption that a strong climate change concern is linked to negative perceptions of nuclear power. Going outside of Europe, a study from Lim and Moon (2021) confirmed that being concerned about the climate also made individuals in South Korea look negatively at nuclear power.

Other nation-level studies such as Sonnenberger et al (2021), Corner et al (2011) and Pidgeon (2008) find that high environmental values and concerns about the climate are negatively associated with the support for nuclear power. The UK has historically been divided over nuclear energy according to Corner et al (2011), where very few express unconditional support for nuclear power. Only when nuclear power was given a 'reluctant acceptance' framing, meaning an acceptance toward nuclear power as a solution to climate change, the people most concerned about climate change became more likely to embrace it (Corner et al, 2011). Nuclear power is therefore in some cases accepted if it acts as a means to limit individual worry about the climate. Similar results were found in a study from Ertör-Akyazı (2012) in Turkey, where opponents to nuclear power were found to be more concerned about the environment. However, the ones who were the most in favor of nuclear power were educated men, with a good education and a high understanding and interest in climate related questions (Ertör-Akyazı et al, 2012).

The previous research, while focusing on the issue on a national macro-level, therefore points to a hypothesis where individuals with a high level of concern about the climate also have low support for worries about the climate. Individuals with a high degree of worry might see the negative parts of nuclear power instead of the benefits. The solutions for the climate crisis are not the status quo, the nuclear power, and instead see investments in renewable energies as the solution to the problem. Nuclear power is instead in the way of the energy transformation and the "correct" ways of mitigating climate change according to a climate concerned individual. Here it is also important to note the importance of the context; a country with individuals that have a high degree of worry about the climate should have a negative correlation with support for nuclear power, as found in some previously mentioned studies in countries with high levels of climate concern (Sonnenberger et al 2021;, Corner et al 2011; Pidgeon 2008; Pampel 2011). A high level of concern about the climate should therefore also in this study result in lower support for nuclear power. Figure 1 show the study's conceptual framework as well as explains the first hypothesis.
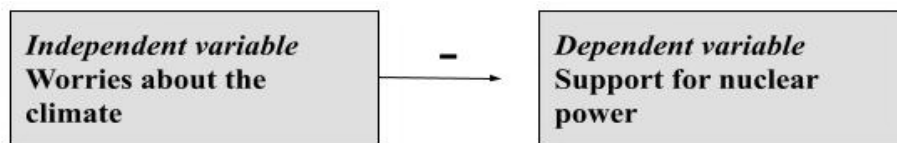
Figure 1. Conceptual framework

Hypothesis 1. *Individuals' worries about the climate have a negative correlation with support for nuclear power.*

2.3. *The individual's ideology*

It is also important to define what left- and right-leaning ideology means. Jahn (2010) points out that the dimension is time- and country-specific, which means that it will be different when accounting for context. In this context I will use what Dictionary.com describes as left leaning ideology, where they define the left as "people and groups that have liberal views", which generally means support for progressive reforms. I argue that includes progressive climate reform. Right-leaning ideology on the other hand means that individuals and groups "are disposed to preserving existing conditions and institutions" (Dictionary.com, 2020). In this case, I argue that it involves the preservation of nuclear power. Ideology is introduced in

this section as a means to explain the different attitudes toward nuclear power among climate-concerned individuals as well as to answer if ideology affects the relationship between worries about the climate and support for nuclear power. Ideology can also act as an explanation for the rise in support for nuclear power while the concerns about the climate remain since individuals can view it as a solution or roadblock to climate change. Harring and Sohlberg (2017) points out that left-leaning individuals are more supportive of environmental policies than right-leaning individuals. They write that one reason for lower levels of support among right-leaning individuals than left-leaning people is their stronger preference for economic growth and lower acceptance of intervention in markets. So even though left and right-leaning individuals are concerned about the climate they have different views on the solutions. While the correlation between high concern about change in the earth's climate is assumed to have a negative correlation with support of nuclear power, it does not explain why there still could be a large difference between individuals in the climate-concerned group.

As some previous literature points out, left-leaning voters have lower support for nuclear power than right-leaning individuals (Holmberg, 2019; Edberg & Tarasova, 2011; Pampel, 2011). While left leaning voters are more concerned about the climate, worries among both left- and right-leaning voters are undoubtedly high (Jönsson, 2020), which is why the relationship is complicated. Hypothetically, if we assume that the difference in worries about the climate between left and right-leaning individuals are about the same, an individual's left- or right-leaning ideology could prove to explain the difference among climate concerned individuals regarding their support for nuclear power. This study therefore also aims to answer if ideology explains the difference in attitudes toward nuclear power among individuals with a high concern about the climate.

So how can we assume that an addition of an ideological mechanism affects the correlation between worries about the climate and the view of nuclear power? A left-leaning individual will most likely increase the negative correlation between worries about the climate and nuclear power, since they view nuclear power as a part of the status quo, and therefore has to be replaced. Presumably, a leftist individual will advocate for government actions and investments in renewable energy, so nuclear power might not be a part of their view on how to mitigate global warming and concerns about the climate. However, it could also prove to be a divider among left-leaning individuals since nuclear power is a "greener" source of

energy than fossil fuels. In the short term, a complete denuclearization could make a nation more dependent on fossil fuels, which could cause a cognitive dissonance for a left-leaning individual. But nevertheless, nuclear power is not a progressive reform that left-leaning individuals support. A right-leaning individual with concerns about the climate still wants to take a cautionary approach to investments in renewable energy, since they prefer the preservation of existing systems and conditions. As previous literature states, a right-leaning individual views climate intervention as costly and damaging to the economy (Harring et al 2017). I argue that nuclear power, in the eyes of a right-leaning individual with concerns about the climate, is viewed as the best way of mitigating release of carbon dioxide without the short term economic downsides. This indicates that the relationship will remain about the same when accounting for a right-leaning ideology. The relationship between worries about the climate and nuclear power being even more negative when accounting for a left-leaning ideology.

Figure 2. How a left-leaning individual's ideology is expected to interact with worries about the climate and support for nuclear power.

Hypothesis 2a. *Left-leaning ideology increases the negative correlation between worries about the climate and support for nuclear power.*

A right-leaning individual with concerns about the climate might still want to take a cautionary approach to investments in renewable energy. In the short term, a right-leaning individual might view an energy-transformation from nuclear power to renewable energy as costly and damaging to the economy. Nuclear power could also, in the eyes of a right-leaning individual with concerns about the climate, be viewed as the best way of mitigating release of carbon dioxide without the short term economic downsides. An individual with a

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right-leaning ideology might therefore make the correlation between worries about the climate and nuclear power less negative.
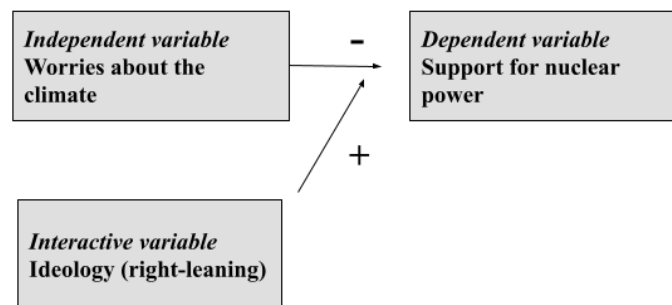

Figure 3. How a right-leaning individual's ideology is expected to interact with worries about the climate and support for nuclear power.

Hypothesis 2b. *Individuals´ right-leaning ideology decreases the negative correlation between worries about the climate and support for nuclear power.*

3. Research design

The aim of the study is to research the relationship between worries about the climate and nuclear power, and the impact an individual's left or right-leaning ideology has on said relationship. In order to research the variables and apply it to a Swedish context, cross-sectional data from the SOM-institute will be used. An explanation as to why the Swedish context is chosen and a table of descriptive statistics will also be presented. An ordinary least squares (OLS) analysis will be performed in order to find out the correlation between worries about the climate and support for nuclear power as well as the strength of the interactive- and control variables.

3.1. *The Swedish Case*

Gerring (2004) defines a case study as "(...) an intensive study of a single unit with an aim to generalize across a larger set of units". This case study therefore takes place in Sweden for a couple of reasons. The Swedish case is especially interesting because of the historical debate regarding nuclear power and the high level of concern about the climate. Ever since the national referendum on nuclear power in 1980, there has been a long and drawn out debate

regarding what should be considered a green source of energy, where right-leaning politicians have argued for benefits of nuclear power and left-leaning politicians have opposed it (Edberg & Tarasova 2011). I argue that nuclear power is a more difficult issue among left-leaning voters than right-leaning voters, perhaps especially in Sweden. Some other countries have come to almost unanimous political decisions regarding their stances on nuclear power. In Germany for example, climate concerned individuals from the ideological left and right seem to both be against nuclear power while the left-leaning government in Finland is in favor of nuclear power and even expansion. A new nuclear power plant opened as late as 2022 in Finland, despite having a 13 year delay because of technical problems (Mulligan, 2022). The question is still polarized in Swedish politics and among the voters (Holmberg 2019). It is an issue which might cause cognitive dissonance among left-leaning individuals in Sweden, since they want to phase out nuclear power in favor of renewable energy, while nuclear power at the same time could still prove to be the best option among other worse energy sources (fossil fuels for example). Meanwhile, a large majority of the total Swedish population is, as mentioned in the introduction, very or rather worried about changes in the climate. This speaks for the importance of investigating the differences among climate concerned individuals and their stances on the future of energy policies.

It is important to note that the view on nuclear power will be different in different countries based on factors such as the country's dependence on nuclear power and if there has been a nuclear accident nearby. Studying ideology, I argue, is mostly relevant in this context on an individual level in a single nation rather than on a continental level. Ideology could therefore also act differently in other contexts when studying the relationship between climate worries and nuclear power. Sweden and Germany are in many ways similar countries, two western democracies, but the political stances are highly different from each other. This study may therefore not be applicable everywhere, but it does not however mean that Sweden is an entirely deviating case. Pampel (2011) writes that the support for nuclear power is associated with higher socioeconomic status, which means that one should be able to find similar results in other western european countries. Generalizations are difficult to make, however since Pampel also points out that left-leaning individuals in some other European countries have lower support for nuclear power, ideology should be tried and applied in other countries with similar levels of climate concerns. There is therefore support for the study's ability to be generalized, but it is limited due to the difficulty surrounding the context of nuclear power.

3.2. *Method*

The study will use an Ordinary least squares (OLS) regression model to analyze the relationship between the dependent and independent variable. Regression analysis is a powerful and useful tool for the study's purpose since it allows you to test the correlation between a lot of different variables. Because of the importance of controlling for some other variables, a statistical design is more convenient than other options since it aims to get information from a rather large number of variables. It is important to note that an OLS-regression model is not ideal when the dependent variable (in this case *support for nuclear power*) is a categorical variable which assumes a number of values. This will be treated in the discussion of this study. Regardless, by studying the confidence interval, the t-distribution and p-value, it is possible to determine if the result is statistically significant while still using an OLS-method of analysis. A quantitative research design is desirable in order to answer the research question if ideology affects the relationship between climate concerns and nuclear power. This will make sure that the study provides an answer to the research questions and the hypotheses.

3.3. *Data*

In order to research the relationship between the two variables and apply it to a Swedish context, I will use data from the SOM-institute from the 2019 public opinion survey in Sweden. The SOM-institute conducts annual public opinion surveys on the Swedish population. The public opinion polls are sent out every fall to 30.000 random Swedish citizens. The total number of observations of this study came to 1471. The use of SOM-institute data gives the study a higher degree of reliability, since it is a commonly used database in research. The variables are defined in a similar way to which they are defined as in the SOM-institute questionnaire, which increases the study's validity. This is also done in order to make sure that the research is performed in a way that is easily replicated. In order to achieve high reliability it is also important to handle the data with care in order to avoid random data- or unsystematic errors. To exemplify: two individuals can be equally worried about the climate, but when filling out a questionnaire, one of the individuals checks the box for "very worried" and the other "rather worried" (Esaiasson et al, 2017).

3.4. *Variables and operationalization*

3.4.1. *Dependent variable*

The dependent variable is support for nuclear power. The variable is operationalized with the help of SOM-institute data. There are a couple of questions regarding nuclear power, but the question I use is: "in general, what is your attitude toward the following energy sources?" (in Swedish: *Allmänt sett, vilken är din inställning till följande energikällor*?), where nuclear power is included. The question is a multi-item measure with five options from "very negative", "rather negative", "neither positive nor negative, "rather positive" or "very positive". Those answers will be coded on a scale from 1-5, where "very negative" will be 1 and "very positive" will be 5.

3.4.2. *Independent variable*

The independent variable is worries about the climate, and is defined as worries about changes in the earth's climate. This variable is operationalized with a multi-item question from the SOM-institute. The question which will be used is: "if you consider the current situation, how worried are you about the future?" (in Swedish: *om du ser till läget i dag, hur oroande upplever du själv följande inför framtiden?*), and base it on the sub-question: "worries about changes in the earth's climate" (in Swedish: *förändringar i jordens klimat*). The options are: "very worried", "rather worried", "not very worried" or "not worried at all". These answers will be coded from 1-4, where 4 is "very worried" and 1 is "not worried at all".

3.4.3. *Interactive variable*

The interactive variable is ideology which will be used in an attempt to explain why worries about the climate can stay the same while the support for nuclear power goes up. This variable is therefore a combination of ideology and worries about the climate. The variable is operationalized with SOM-data by using a question where the respondent can place themselves on an ideological scale from "clearly to the right" is 1, "somewhat to the right" is 2, "neither left nor right" is 3, "somewhat left" is 4 and "clearly to the left" is 5. All respondents will be included to see how big of an impact ideology has on the relationship. It is desirable to be able to see the differences that left- and right-leaning people respectively have on the relationship between worries about the climate and nuclear power in order to confirm or deny the study's hypothesis and answer the research questions. The interactive

variable will be tried together with the independent variable, climate worries, to find its correlation with the dependent variable, nuclear power.

3.4.4. *Control variables*

It is reasonable to assume that there are other explanations to the relationship between climate concern and nuclear power. Women tend to oppose nuclear power more often than men, according to Sundström and McCright (2016). Nguyen and Yim (2018) find that higher education increases the support for nuclear power, as well as age according to Wang and Kim (2018). Lim and Moon (2021) also find that a high level of trust in the government could help mitigate the perceived fear of nuclear power. All of these are interesting on their own, and could be relevant in the case of Sweden. In an attempt to find a micro-explanation, this study will use ideology as an attempt to explain individual differences toward nuclear power instead of broad group explanations such as age, gender and level of education. It would also be reasonable to assume that trust in our elected officials and interest in environmental questions could affect both variables and will therefore also be included.

3.4.5. *Descriptive statistics*

The following section will present the number of observations, the median value, standard deviation and a correlation matrix. Table 1 below shows descriptive statistics of the studies variables. 1 is the lowest possible option for support for nuclear power, lowest worry about the climate, the least interest in questions regarding the climate and lowest possible trust in politicians. The age of the respondents in the survey range from 16-85 where they filled out if they are either 16–19, 2 20–24, 25–29, 30–39, 40–49, 50–59, 60–75 or 76–85 years of age. In regards to education, a zero means that the respondents do not have a higher degree education and 1 means that they do. Females were coded as 0 and men as a 1. The number of observations came to a total of 1471.

Table 1. *Descriptive statistics.*

Variable.	Obs.	Mean.	SD.	Min.	Max.
Support for nuclear power	1471	3,042148	1,365111	1	5
Worries about the climate	1471	3,32087	0,7930606	1	4
Ideology (Left - Right) *	1471	2,840245	1,180181	1	5
Age**	1471	4,789259	1,855067	1	8
Level of education ***	1471	0,3684568	0,4825502	0	1
Gender ****	1471	0,5084976	0,5000978	0	1
Trust in politicians	1471	2,201903	0,7279805	1	4
Climate interest	1471	2,947655	0,7137948	1	4

Table 2 shows the correlation matrix. The correlation matrix does however show that there is a high negative correlation between worries about the climate and support for nuclear power. The regression analysis will therefore include covariates one at a time to rule out other explanations. The results from the correlation matrix show that interest in climate related questions relate at a high level with the main independent variable, worries about the climate. But no other covariates at a high level with the dependent variable, which indicates that multicollinearity is not an issue when running the regression analysis.

Table 2. *Correlation matrix.*

	Support for nuclear power	Worries about the climate	Ideology (left-right)	Age	Level of education	Gender	Trust in politicians	Climate interest
Support for nuclear power	1							
Worries about the climate	- 0,3279 *	1						
Ideology (left-right)	- 0,3915 *	0,2598 *	1					
Age	0,0083	0,0081	0,0039	1				
Level of education	- 0,0535 *	0,1068 *	0,0079	- 0,0219	1			
Gender	0,3592 *	- 0,2179 *	- 0,0986 *	0,0481	- 0,1370 *	1		
Trust in politicians	- 0,1338 *	0,2188 *	0,1951 *	0,0114	0,1463 *	- 0,0692 *	1	
Climate interest	- 0,2602 *	0,4707 *	0,1847 *	0,0872 *	0,1370 *	- 0,0512 *	- 0,1905 *	1

* p < 0,05

4. Results

The following section presents the results from the analysis. The regression model will include the dependent-, independent-, interactive- and control variables from the cross-sectional data from the SOM-institute. After praxis, the significance level for rejecting the null assumption is set at a significance threshold of 5 per cent. The first step is to perform the OLS-regression analysis in order to explore the study's hypotheses. The results from the interactive variable will be used to answer whether the relationship between climate worries

and nuclear power changes when accounting for ideology. If there is a great difference, it could imply that the attitudes toward nuclear power are ideological while worries about the climate are not. As mentioned, I relied on an OLS multiple regression for the statistical analysis of the model and STATA 17 as the statistical program.

Table 3 shows the results from the OLS-regression analysis. Model (1-7) shows the results from the dependent and independent variable with one controlling variable added on at a time. Model (8) includes the interactive variable. The results confirm the study's first hypothesis, that the correlation between individuals who are concerned about the climate negatively affects the view on nuclear power. Model 1 in the regression model shows that an increase in worries about the climate by one unit (on the 1-4 scale) is expected to decrease support for nuclear power by 0.56 units on the support for nuclear power scale (1-5). When controlling for other confounding variables, the coefficient for worries about the climate shows a negative correlation with support for nuclear power by -0,21 as shown in Model (7). If worries about changes in the earth's climate increase by one unit, support for nuclear power goes down by 0,21 units. This is not a large change when considering that the scale of the dependent variable is 1-5, but still reaches statistical significance. The results therefore remain robust with control of covariates. Individuals with high levels of concern about the climate are therefore more likely to have lower levels of support for nuclear power, which confirms previous research and hypothesis 1. The Model has an r2-value of 0.301, which means it can explain 30.1% of the variation in the dependent variable.

Model (8) in table 3 shows that the interactive variable, ideology and worries about the climate, has a p-value of over 0,05 which means that it makes no significant impact on the relationship. The interactive variable coefficient is negative (-0.0206) with the dependent variable, but the result is not statistically significant. The interactive variable ideology did not increase or decrease the negative correlation significantly which dismisses both second hypotheses. The difference in attitudes toward nuclear power between left- and right-leaning individuals are therefore not as significant as expected. If the results had reached statistical significance, it would imply that climate concerned individuals with different ideological stances view nuclear power differently. The results show that ideology does affect the relationship between worries about the climate and support for nuclear power, but it does not explain differences on an individual level. It does not, in this study, answer why support for nuclear power can go up while worries about the climate remains.

Table 3. *OLS-Regression results (Model 1-8)*

	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Worries about the climate	-0.564***	-0.418***	-0.418***	-0.413***	-0.316***	-0.312***	-0.210***	-0.158
	(0.0424)	(0.0414)	(0.0414)	(0.0417)	(0.0403)	(0.0408)	(0.0448)	(0.0959)
Ideology (left-right)		-0.380***	-0.380***	-0.381***	-0.365***	-0.362***	-0.353***	-0.283*
		(0.0278)	(0.0278)	(0.0278)	(0.0265)	(0.0268)	(0.0266)	(0.117)
Age			0.00852	0.00810	-0.00198	-0.00185	0.00618	0.00588
			(0.0171)	(0.0171)	(0.0163)	(0.0163)	(0.0162)	(0.0162)
Level of education				-0.0710	0.0231	0.0283	0.0622	0.0634
				(0.0661)	(0.0632)	(0.0638)	(0.0635)	(0.0636)
Gender					0.790***	0.790***	0.813***	0.815***
					(0.0623)	(0.0623)	(0.0619)	(0.0619)
Trust in politicians						-0.0271	-0.00897	-0.00944
						(0.0432)	(0.0430)	(0.0430)
Interest in the climate							-0.256***	-0.254***
							(0.0483)	(0.0485)
Interactive variable (Climate x Ideology)								-0.0206
								(0.0338)
Intercept	4.917***	5.508***	5.468***	5.482***	4.728***	4.765***	5.051***	4.874***
	(0.145)	(0.143)	(0.164)	(0.165)	(0.167)	(0.177)	(0.184)	(0.343)
N	1471	1471	1471	1471	1471	1471	1471	1471
R^2	0.108	0.208	0.208	0.209	0.287	0.287	0.301	0.301

Standard errors in parentheses

* $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$

4.1. Robustness test

In order to test the study's validity and the operationalization of the main variables, two robustness tests were performed. The results from these robustness tests are shown in the Appendix (G and H). In test number one, the operationalization of the dependent variable, support for nuclear power, was changed. Instead of direct support for nuclear power, the support for removal of nuclear power plants long term was measured where 5 = was coded as high support for removal and 1 = low support for removal. The results were similar to the results in the main regression since the interactive variable still did not get a significant result.

The correlation with worries about the climate and support for removal of nuclear power proved to be stronger than the original relationship. In the second test, individuals who answered that they are neither to the left nor right ideological were disincluded in order to see if the difference between left- and right-leaning individuals were greater than in the study. The results from this test were also insignificant.

5. Discussion

In the following discussion section, I will discuss why the results were not significant, present a few of the study's limitations as well as proposals for future research. Neither of the second hypotheses could, by this study, be confirmed. The results from this could indicate that the difference regarding the view on nuclear power among climate concerned individuals, both among left- and right-leaning individuals, is not as big as expected. If this is a result of left-leaning individuals exempting higher support for nuclear power than expected or right-leaning individuals lower is difficult to say. As mentioned previously, nuclear power is likely a divider among left-leaning individuals since there are alternative sources of energy that are more harmful for the environment but is still not the prefered choice. A difference in attitudes among climate concerned individuals toward nuclear power should therefore have other explanations than ideological. The key to the puzzle regarding why the support for nuclear power can rise while worries about the climate remain equally high therefore remains to be found. Especially since the results from this study also confirms that there is a negative correlation between worries about the climate and support for nuclear power. The results show that there is no difference on an individual level, but points to changes on a societal level since ideology on its own, interest in climate related questions and gender proved to correlate with nuclear power significantly.

As mentioned in previously, an OLS-regression model is not ideal when the dependent variable is categorical. It might draw biased linear regression, which is why I have avoided plotting the interactive line. As Hun Myoung Park, a Software Consultant at UITS Center for Statistical and Mathematical Computing, writes in a paper on Categorical Dependent Variable Regression: "When the dependent variable is categorical, the ordinary least squares (OLS) method can no longer produce the best linear unbiased estimator (BLUE)" (Myoung Park, 2001, p.1). The decision to use OLS was made since using a question where you

operationalize the support for nuclear power as for or against is also problematic. An individual can be in favor of nuclear power in the present but be against further expansion, which is why support for long term removal of nuclear power plants was only used in a robustness test. That fact that one can be in favor of nuclear power in the present and still being in support for the removal of the plants might also make whatever an individual answers on a scale from 1-5 misrepresentative of where they actually stand on the question. Measuring support for nuclear power is going to be difficult whichever question you decide to ask, which is a limitation to this study and therefore lowers its validity. The study and the operationalization of the support for nuclear power is complex and limits the conclusions one can draw from this study. I suggest that an ordered logit regression could be tried and used in future similar studies.

The operationalization of the main independent variable, worries about the climate, should also be discussed. In the SOM-questionnaire the respondent gets to select how concerned they are about a number of additional issues than their concern about changes in the earth's climate. This might lead the respondent to compare how concerned they are about the climate to how concerned they are about organized crime, a weakened welfare system and the situation in Russia for example, which might be more pressing issues at the time of answering the questionnaire. The operationalization of this independent variable should ideally be from a stand-alone question where they only answer how concerned they are about the climate.

Another limitation of the study is its lack of ability to be generalized to other nations. Since the support for nuclear power is a highly contextual question which also varies depending on country use and history of nuclear usage, it is difficult to say which countries the results from this study can be applied to. Ideology might work better as a theoretical explanation in other countries for example. This is a limitation since Gerring (2004) states that one should be able to make generalizations from a single case study and then apply it on a broader scale. As mentioned previously, there is a possibility that one can find similar results from other western european countries since Pampel (2011) connects high socioeconomic level with support for nuclear power. This is, however, on a societal level and does not necessarily mean that one will find the differences on an individual level as this study attempted to do.

6. Conclusion

In conclusion, this study tried to answer whether ideology can explain why worries about the climate stay the same while the support for nuclear power goes up. Previous studies have established a negative link between worries about the climate and nuclear power, but in some cases the support for nuclear power can rise while the climate worries remain on the same level, in Sweden for example. To try this, ideological differences were tried as an explanation, where left-leaning individuals with high levels of climate concern were expected to negatively correlate with support for nuclear power while right-leaning individuals were expected to have higher support. This theory did not find support, since the differences in the group with worries about the climate from different ideological backgrounds did not get a significant result in the correlation with support for nuclear power. The null-results could also speak in favor of the relationship being ambiguous, since individuals can view nuclear power as either a solution toward or a road-block against climate change and therefore worries about the climate. The debate regarding the future of nuclear power will most certainly continue.

Even though the results were not significant, it showed that even though the level of concern about changes in earth's climate can be high, the support for nuclear power can rise. However, why the attitudes toward nuclear power are different in that group remain unanswered. The groups with individuals who are concerned about the climate are not a homogenous group, but the differences among them should be further studied. This is of relevance for law-makers as well as for the public debate, since the facts of global warming are not going anywhere. The worries about the climate are bound to rise, and the solutions have to continue to be discussed. What role will nuclear power have in the future? There is also undoubtedly a value in researching this qualitatively with left- and right-leaning individuals, ideally individuals who are concerned about the climate. This could provide an in-depth reasoning behind their view on nuclear power, and how it correlates with their view on the climate and potential concerns.

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Appendix
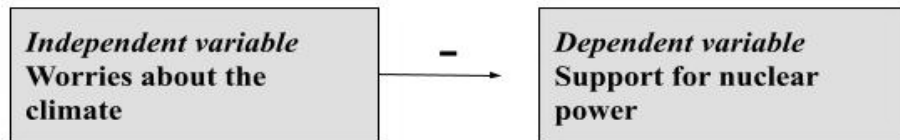
Appendix A - Conceptual framework.

Figure 1. The study's conceptual framework.

Appendix B - Figure for hypothesis 2a.

Figure 2. How a left-leaning individual's ideology is expected to interact with worries about the climate and support for nuclear power.
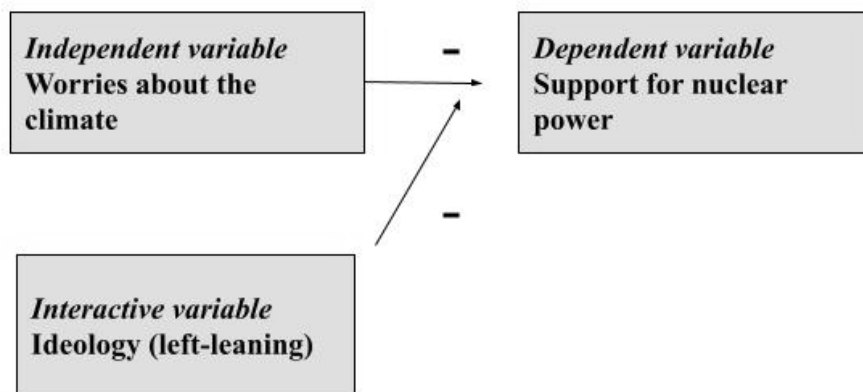
Figure 3. How a right-leaning individual's ideology is expected to interact with worries about the climate and support for nuclear power.

Appendix D - Descriptive statistics.

Variable.	Obs.	Mean.	SD.	Min.	Max.
Support for nuclear power	1471	3,042148	1,365111	1	5
Worries about the climate	1471	3,32087	0,7930606	1	4
Ideology (Left - Right) *	1471	2,840245	1,180181	1	5
Age**	1471	4,789259	1,855067	1	8
Level of education ***	1471	0,3684568	0,4825502	0	1
Gender ****	1471	0,5084976	0,5000978	0	1
Trust in politicians	1471	2,201903	0,7279805	1	4
Climate interest	1471	2,947655	0,7137948	1	4

Table 1. *Descriptive statistics.*

Appendix E - Correlation matrix.

	Support for nuclear power	Worries about the climate	Ideology (left-right)	Age	Level of education	Gender	Trust in politicians	Climate interest
Support for nuclear power	1							
Worries about the climate	- 0,3279 *	1						
Ideology (left-right)	- 0,3915 *	0,2598 *	1					
Age	0,0083	0,0081	0,0039	1				
Level of education	- 0,0535 *	0,1068 *	0,0079	- 0,0219	1			
Gender	0,3592 *	- 0,2179 *	- 0,0986 *	0,0481	- 0,1370 *	1		
Trust in politicians	- 0,1338 *	0,2188 *	0,1951 *	0,0114	0,1463 *	- 0,0692 *	1	
Climate interest	- 0,2602 *	0,4707 *	0,1847 *	0,0872 *	0,1370 *	- 0,0512 *	- 0,1905 *	1

$* \ p < 0,05$

Table 2. *Correlation matrix.*

Appendix F - OLS-Regression

	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power	Support for nuclear power
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Worries about the climate	-0.564***	-0.418***	-0.418***	-0.413***	-0.316***	-0.312***	-0.210***	-0.158
	(0.0424)	(0.0414)	(0.0414)	(0.0417)	(0.0403)	(0.0408)	(0.0448)	(0.0959)
Ideology (left-right)		-0.380***	-0.380***	-0.381***	-0.365***	-0.362***	-0.353***	-0.283*
		(0.0278)	(0.0278)	(0.0278)	(0.0265)	(0.0268)	(0.0266)	(0.117)
Age			0.00852	0.00810	-0.00198	-0.00185	0.00618	0.00588
			(0.0171)	(0.0171)	(0.0163)	(0.0163)	(0.0162)	(0.0162)
Level of education				-0.0710	0.0231	0.0283	0.0622	0.0634
				(0.0661)	(0.0632)	(0.0638)	(0.0635)	(0.0636)
Gender					0.790***	0.790***	0.813***	0.815***
					(0.0623)	(0.0623)	(0.0619)	(0.0619)
Trust in politicians						-0.0271	-0.00897	-0.00944
						(0.0432)	(0.0430)	(0.0430)
Interest in the climate							-0.256***	-0.254***
							(0.0483)	(0.0485)
Interactive variable (Climate x Ideology)								-0.0206
								(0.0338)
Intercept	4.917***	5.508***	5.468***	5.482***	4.728***	4.765***	5.051***	4.874***
	(0.145)	(0.143)	(0.164)	(0.165)	(0.167)	(0.177)	(0.184)	(0.343)
N	1471	1471	1471	1471	1471	1471	1471	1471
R^2	0.108	0.208	0.208	0.209	0.287	0.287	0.301	0.301

Table 3. *OLS-Regression results (Model 1-8)*

Appendix G - Robustness test 1

	(1)	(2)
	Support for removal of nuclear power plants	Support for removal of nuclear power plants
Worries about the climate	0.360***	0.303**
	(0.0434)	(0.0938)
Ideology (left-right)	0.333***	0.257*
	(0.0263)	(0.115)
Age	-0.0288	-0.0284
	(0.0157)	(0.0157)
Level of education	0.0101	0.00869
	(0.0625)	(0.0625)
Gender	-0.562***	-0.564***
	(0.0600)	(0.0600)
Trust in politicians	0.132**	0.133**
	(0.0419)	(0.0419)
Interest in the climate	0.198***	0.195***
	(0.0465)	(0.0467)
Interactive variable (Climate x Ideology)		0.0226
		(0.0332)
Intercept	0.407*	0.600
	(0.175)	(0.333)
N	1576	1576
R^2	0.292	0.292

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix H - Robustness test 2

	(1)	(2)
	Support for nuclear power	Support for nuclear power
Worries about the climate	-0.246***	-0.135
	(0.0512)	(0.0952)
Ideology (left-right)	-0.346***	-0.184
	(0.0265)	(0.120)
Age	0.00814	0.00718
	(0.0184)	(0.0184)
Level of education	0.0487	0.0515
	(0.0706)	(0.0706)
Gender	0.831***	0.833***
	(0.0702)	(0.0702)
Trust in politicians	0.0219	0.0195
	(0.0486)	(0.0486)
Interest in the climate	-0.247***	-0.238***
	(0.0547)	(0.0551)
Interactive variable (Climate x Ideology)		-0.0475
		(0.0345)
Intercept	5.080***	4.699***
	(0.206)	(0.345)
N	1104	1104
R^2	0.349	0.350

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$