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THE ECOLOGICAL AWARENESS AND FEAR FOR CLIMATE CHANGE IN EUROPE

Abstract: The impacts of climate change and related hazards are increasingly being felt across the world. It is recognised that climate change is largely anthropogenic and caused by a continuous worsening of environmental conditions. Whether and to what extent these hazards will result in human fatalities depends on the vulnerability of the people affected, or positively put, on their robustness and resiliency. People can choose to respond to the prospect of climate change and decide what steps to take. At community level, they can develop new technologies that will allow economic development while reducing the anthropogenic contributions to climate change. At individual level, the most aware people react to climate change by adopting responsible behaviours. Thus, an important question is whether and how people are aware of the environmental worsening conditions.

In this paper, we examine the spreading of the fear for climate change in the 27 countries of European Union. Using the Eurobarometer 2011 survey and multilevel logistic regression models with individuals nested in countries, we found a high level of heterogeneity in people's concerns about climate change across Europe and, within countries, across individuals with different socio-demographic characteristics. Highly educated people and those who have, or plan to have, children are the groups most concerned about the future challenge posed by climate change.

Keywords: Climate change, human choices, environmental awareness, multilevel analysis, European policies, Eurobarometer.

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1. Introduction

The harsh effects of climate change and related hazards are increasingly being felt across the world. A large consensus has emerged among scientists about the nature and the impact of climate change. It is widely recognised that climate change is largely anthropogenic and that, in turn, a progressive deterioration of environmental conditions will have a strong impact on populations' and individuals' well-being (Lutz, 2010).

Climate change threatens traditional livelihoods both directly and indirectly: apart from the direct negative effect on mortality and morbidity caused by extreme events such as severe storms, hurricanes, inundations, etc., people are likely to be exposed to increasing health hazards resulting from changing regional and temporal pattern of temperature and humidity, which may impact on agricultural production and the spread of certain diseases. Loss of livelihood may force or simply encourage out-migration (McBean, Ajibade, 2009) but also social disruption and economic hardship. It has been demonstrated (Rendall, 2011) that hurricane Katrina, which hit the city of New Orleans in 2005, caused an excess breakup of unions beyond and after the direct impact on family disruption. Similar effects could be expected on human reproduction, though the studies on that are still lacking (Rendall, 2011).

Whether and to what extent these hazards will result in human fatalities depends on the vulnerability of the people affected, or on their robustness and resiliency, which are in turn affected by the economic and cultural development of the population involved. As a result, different strategies can be adopted for strengthening adaptive capacities in order to cope with unavoidable climate change (Lutz, 2010). It can be assumed that in countries where environmental sensitivity is more widespread, people react to climate change by adopting more responsible behaviours and even by changing their attitudes.

The aim of this paper is to explore the spreading of the environmental awareness and the fear of the effects of climate change in Europe. We expect to find a high level of heterogeneity across European countries as far as the level of sensitivity to environmental problem is concerned and also, within each country, across people with different individual characteristics.

2. Climate change and human choices: involving individuals into political agendas

"We all know that the world faces a threat potentially more catastrophic than any other threat in human history: climate change and global warming" (Tolba, 1991). Many reasons, and combinations of reasons, have been identified for this big concern. Emissions of greenhouse gases from human activities constitute the proximate cause, but there are many possible underlying causes: population growth, overconsumption, humans' inability to control the technologies they have created, their inability to implement environmentally benign technologies, their unwillingness to spend current wealth to benefit future generations, and their powerlessness to forge effective international agreements and abide by them.

Whatever the cause, climate change is framed as a problem, which admits solutions that, in turn, are strongly related to the possibility of human choice, albeit constrained: that is, humans can choose to respond to the prospect of climate change by deciding on what steps to take, with undetermined and perhaps undeterminable degrees of freedom (Rayner, Malone, 1998).

An important question to be answered is whether and how people contribute to moderate the environmental risks, or react to them by making informed or even wise choices. At community level, they can develop new technologies that will allow economic development while reducing the anthropogenic contributions to climate change. Since it is a global issue, the obvious decision makers are the governments of nation states who have enjoyed legitimacy as the arbiters of high policy throughout the modern era. People usually expect their governments to choose goals (such as emission reductions) and policy instruments (e.g. a carbon tax). This is the reason why most of the sociological research on the topic of climate change focuses on the macro level of national and international policies. However, policies at the macro level may induce important dimensions of actions and decisions taken at different levels, closer to the individuals. The slogan, "Think globally-act locally" expresses the widespread recognition that choices are made at the micro level, by individuals and groups in particular places. Even in the context of national or international regulations, firms, families, communities and

citizens choose how to respond to incentives and sanctions, or to try independent and voluntary strategies to moderate or adapt to environmental problems, by means of responsible behaviours (Rayner, Malone cit.).

Climate policies as such are bound to be hard to implement. Simply incorporating the issue of climate change into existing political agendas is unlikely to produce the desired outcomes. Similarly, presenting climate change measures as ways of achieving higher taxation or welfare expenditures could also meet with significant opposition.

The convention on climate change represents an important expression of world-wide concern about environmental issues and the persistent questions of global development which are inextricably linked. Thus, effective actions designed to mitigate, or adapt to, climate change will be those which are most integrated into general policy strategies for economic and social development, and those involving local actors as well as families and individuals.

The long history of international and intergovernmental attempts at finding a solution to the globally shared climatic emergency proves the complexity of the discourses about the environmental issues. Awareness of environmental issues is a relatively recent phenomenon at political and international level. The story begins in Stockholm in 1972, with the United Nations Conference on Human Environment. In the same year, the famous Report to the Club of Rome was published, which theorised about the physical limits to economic growth: natural resources were said to be not unalterable but limited – and thus setting a limit to the human economic activities.

However, five years later in 1977, Wassily Leontief published his report commissioned by the UN which stated the conviction that, with the provision of adequate well-designed economic and technological mechanisms, the ecological problem could be solved without imposing unnecessary constraints to the possibility of economic growth (Leontief et al., 1977).

In 1987, the Brundtland Report for the first time asserted the concept of sustainable development: “Sustainable development is defined as development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN, 1987). Almost in response to that report’s exhortation to reduce the impacts of economic growth on the en-

vironment, the 1991 "Beijing Declaration", signed by representatives of 77 countries in the developing world, firmly affirmed the right of developing countries to complete their industrialisation transition that was considered a much more important goal than that of environmental protection. The following year, the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro adopted "Agenda 21" – the first major policy document of environmental protection policies. Thus, we arrive at the Kyoto Summit in 1997. Delegates to the United Nations Convention on Climate Change signed a protocol under which industrialised countries of the OECD committed themselves to reducing their emissions of greenhouse gas emissions by 5.2% on average compared to 1990 levels over the time frame 2008-2012. However, the protocol left unresolved many of the problems related to the high costs and, more specifically, to the lack of any principle of burden-sharing. Both mitigation strategies, aimed at reducing emissions into the air and increasing the ability to absorb greenhouse gases from the earth, and adaptation strategies, designed to mitigate the effects of climate change already in place, are very expensive in technological innovation and converting production processes with too strong environmental impact. This increases the risk of striking differences between countries, in particular between newly industrialised and richer ones. For these reasons, the Kyoto Protocol stirred much controversy and has not yet achieved the desired results.

Within this framework, the Stern Review on the Economics of Climate Change appears in 2006, released by Oxford economist Nicholas Stern and the commission he presided. After stating that climate change is the most serious threat facing humanity today that calls for urgent intervention, the Review comprehensively addresses the issue of climate change and the costs associated, showing that it is necessary to adopt a multidimensional approach. In addition to the economic aspect, both the sociopolitical and the ethical dimension are taken into account. The Stern Review indicates the essential measures of intervention: the creation of "carbon markets" to cool the dynamics of the coal price; the development of new technologies, using the leverage of investment in research and development; promoting substantial cuts to emissions by influencing both the behaviour of businesses and consumers' lifestyles.

As stated in the most recent Report on Climate Change (IPCC, 2014), the numerous assessments that have been carried out have led to increased awareness among decision makers and stakeholders of climate risks and adaptation needs and options. However, this awareness is often not translated into the implementation of even simple adaptation measures within ongoing activities, which may need to be linked more directly to actions involving local institutions, households and individuals. For example, decision support must also recognise that human psychological dimensions play a crucial role in the way people perceive risks and make decisions (IPCC, cit; Section 2.2.3). Impacts of climate changes and adaptation options will also have to be successfully communicated at the local and individual scale. Recently the emphasis has moved from better defining exposure and potential impacts to a better understanding of the factors that affect people's sensitivity to those impacts and their capacity to adapt.

Awareness raising, outreach, community meetings and other educational programs are important for disseminating knowledge about adaptation options (Aakre, Rübbelke, 2010; Birkmann, Teichman, 2010). "In other words, there is an overall acknowledgement that achieving practical steps to address climate change will demand some difficult political, social and individual choices, which actors at different levels of decision making are currently trying to make sense of" (Lorenzoni, Pidgeon 2006, p. 74). Thus, to be effective the decision making process requires taking into account the public view.

3. Climate change in Europe and adaptation policies

One of the chapters of the Intergovernmental Panel on Climate Change WGII AR5 (IPCC, 2014) was particularly devoted to Europe, for the first time documenting a wide range of climate impacts for the "old continent". Climate projections show a marked increase in high temperature extremes, meteorological droughts as well as heavy precipitation events with variations across Europe. Sea level rise and increases in extreme rainfall are predicted to further step up coastal and river flood risk and, without adaptive measures, will substantially increase flood damages.

Climate change is expected to present challenges to many European economic and social sectors, but the risks are heterogeneously distributed across the continent: it is mainly expected that economic activities in southern Europe will be negatively affected more than in other sub-regions, and that disparities in income among regions will increase.

Some countries will actually benefit from the climate change, above all the northern ones (Germany, Great Britain and, to a smaller extent, France), while the Mediterranean countries – namely Italy and Spain – will be negatively affected (Galeotti, Roson 2012). For example, after 2050, tourism activity is predicted to decrease in southern Europe and to increase in northern and continental Europe. Cereal yields are likely to increase in northern Europe and to decrease in southern Europe; the value of wine products and the livelihoods of local wine communities is expected to decrease in southern and continental Europe while an increased production is expected in the north. Furthermore, climate change is likely to affect human health in Europe: heat-related deaths and injuries are likely to increase, particularly in southern Europe. Climate change and sea level rise may damage European cultural heritage, including buildings, local industries, landscapes and archaeological sites, and some cultural landscapes may be lost forever.

As far as adaptation policies are concerned, European countries do not perform badly compared to other world regions. Indeed, the capacity to adapt in Europe is higher than in other parts of the world. Adaptation policies have been developed at international (European Union), national and local government levels, with some planning integrated into coastal and water management, into environmental protection and land planning, and into disaster risk management. Again, there are important differences between and within European sub-regions. An analysis of national adaptation strategies (Hanger et al., 2013) shows considerable political commitment to implement adaptation planning and awareness raising but also many differences in adopted measures (EEA, 2013). At the local government level, adaptation plans are being developed in several cities including London, Madrid, Manchester, Copenhagen, Helsinki and Rotterdam (Hunt, Watkiss, 2011).

In the frame of European recommendations (EC, 2014), the

most effective adopted strategies prove to be those which implemented a high involvement of local communities, households and individuals: the public opinions and expectations about environmental problems and their consequences are important tools for policy makers to have some of their proposals sustained at local level. Generally, people are not likely to support initiatives addressing climate change unless they consider the issue a very serious problem for society and/or the ecology, or one that affects them personally: this recalls the notion of responsibility, i.e. an individual's perception of his/her own and other peoples' role in control over climate change (Hawthorne, Alabaster, 1999). These findings raise a variety of issues: What is the role of public views and opinions in environmental policies? What is the level of climate change awareness in Europe? What are the differences among countries and, within countries, across different groups of individuals?

4. Public Opinion on Climate Change in Europe

An interesting review of public opinions and attitudes on climate change in Europe and the US may be found in Lorenzoni and Pidgeon (2006). One of the earliest studies considered in this review is the 1992 Gallup Health of the Planet Survey according to which in 13 out of 24 countries world-wide more than half of the respondents reported that climate change was a serious problem. Of these 13 nations, 8 were in Europe while the US did not figure among them. More than 65% of the interviewed population indicated global warming as a serious, or somewhat serious, issue.

Since 1992, cross-cutting European level opinion surveys have been commissioned by the European Community/the European Union. Such surveys were undertaken among representative samples of citizens in its Member States, and specifically on topics related to the environment (Special Eurobarometers/EB in 1992, 1995, 2002, 2004, 2007, and a Flash EB in 2002). These have included questions on concerns and worries about environmental issues such as climate change. Although the results of the polls are not directly comparable longitudinally, as the format of the questions got modified over subsequent editions, they

provide a general indication of how public opinion on these matters has changed over time. In 1992, 89% of respondents in the EC-12 were very/somewhat worried about the greenhouse effect; of these, 62% were very worried (INRA, 1992). In 1995, public concern was similar: 84% declared themselves to be very/quite worried about climate change as a global environmental threat (INRA-ECO, 1995). By 2002, another survey (EORG, 2002) suggested that concern about climate change might in fact be declining among the European public: only 39% were found to be very worried, although considerable variation was detected among Member States. The most worried countries were in southern Europe, i.e. Greece (63%) and Italy (49%), whilst the least worried countries were in northern Europe, i.e. the Netherlands (21% of very worried respondents), Ireland (25%) and the UK (26%). This was quite an unexpected result, given that the northern European countries have been traditionally more concerned about the climate, influenced by the perceived links between environmental degradation and decreased quality of life (EORG, 2002, p. 12).

In the 2007 EB survey, respondents were asked to tell what first came to their mind when talking about environmental issues and 19% of them gave climate change as an answer (TNS, 2008). Climate change was listed second only to pollution, reported by 22% of the EU respondents. Socio-demographic factors appeared to extensively affect the attitude of Europeans: the younger the respondents, and the longer they had spent in full-time education, the more likely they were to connect the concept of the environment to climate change. Moreover, there were relevant differences between the EU15 and the 12 new Member States with the former being more sensitive to global environmental problems than the latter. In the same survey, climate change was selected from a list of 15 items as the most relevant environmental issue (57% of Europeans) and it was also ranked top of all items provided (among other very frequently reported issues such as: pollution, depletion of resources, natural disasters). Importantly, in the 2007 special Eurobarometer survey (TNS, 2008) 78% of the EU respondents indicated that environmental problems had a direct effect on their daily lives, suggesting the great value attached by people to the environment and the increasing awareness of its role in their lives. This is an important finding because earlier studies emphasised the dominant societal dimension of climate change issues in

people's minds. Despite the relatively high concern levels, climate change was typically perceived secondary in relation to personal and social issues. However, as the comparison between the EB 2004 and 2007 survey data suggests, the link between climate-related issues and the individual's personal sphere of life becomes more and more common in people's perception.

Another important issue related to public opinion on climate change concerns the dimension of the perceived threat of environmental change. Although most Europeans are aware of the potential world-wide risks of a changing climate and its adverse consequences that may affect societies, they tend to attenuate the risks to themselves personally. Similarly, people associate a sense of importance, urgency and negativity with climate change, but they do not necessarily perceive it as a "domestic" issue (Lorenzoni, Pidgeon, 2006).

With the aim to see how far this societal environmental problem affects people's life decisions we examine in the rest of the paper the correlation between individuals' sensitivity to environmental problems and individual characteristics while controlling for cross-country variance. We consider a full set of individuals' socio-demographic and economic variables but place special emphasis on actual and the additionally intended number of children. The focus of our analysis is indeed to see whether and how environmental concern influences an individual's family size.

5. Who are the "most worried ones" in Europe? An analysis of 2011 Eurobarometer survey

In this section we provide a descriptive analysis of the Eurobarometer 2011[1] survey which contains information on people's perception of climate change. Results show that in the EU27 as a whole, 20% of Europeans considered climate change to be the

[1] The stratified sampling procedure used in this survey assures nearly equal probability samples of about 1,000 respondents aged 15 or above in each of the countries. The sample size allows equally precise estimates for small and large countries, as well as drawing comparisons between sub-groups broken down by sex, age, education, marital status etc. The surveys used a single uniform questionnaire design, with particular attention being paid to equivalent question wording across languages.

biggest problem of the future and 50% reported it just as one of the future problems.

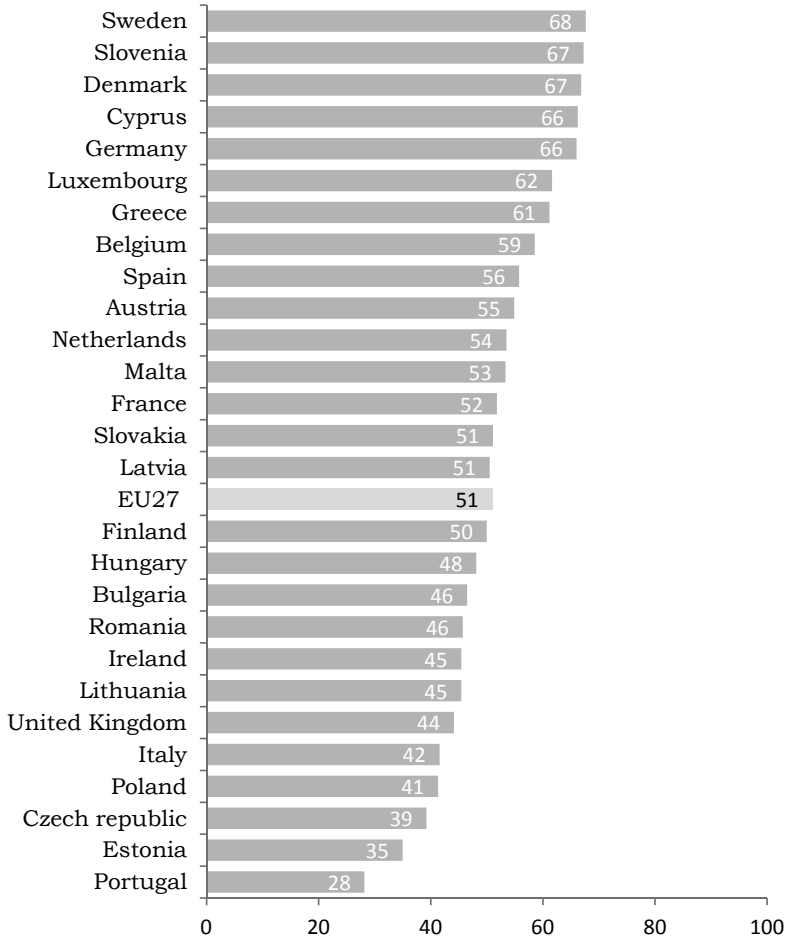
There is considerable cross-country variation in the share of people who were concerned, either weakly or strongly, about the climate (Figure 1, panel a). The percentage ranges from 28% in Portugal, to more than 60% in Sweden, Denmark, Slovenia, Cyprus, Germany, Luxembourg and Greece. In most of the countries (16 out 27) the majority of individuals were somewhat worried. The country rank does not properly reflect the ranking observed in past EB surveys on a similar topic, according to which climate change was perceived as a problem especially in the southern European countries. Only Greece scored very high in the rank, taking sixth position among the most worried countries, followed by Spain with 56% of people sensitive to climate issue. In Italy, less than 50% of people considered climate change to be a serious challenge for the future, and Portugal was the country with the lowest share of concerned people. This inconsistency with previous findings can be explained by the fact that climate change has been studied using different approaches in the various EB rounds, so differences across EB surveys should not necessarily be taken as evidence for a real temporal trend.

If we consider people perceiving climate change as the biggest problem of the future rather than just one of the problems, the share of environmental worriers becomes much lower, ranging from 7% in Portugal to 34% in Luxembourg followed by Denmark, Sweden and Malta (Figure 1, panel b). The country ranking is similar to that observed for people reporting climate change to be just one of the future problems, with most northern European countries appearing at the top of the list. However, some notable differences can be found: first, more eastern European countries show high levels of serious concern; second, Spain is the only southern European country with values above the EU27 average. Greece, which was sixth in the country classification of sharing climate concern, scores very low in the list of countries very seriously worried about climate, ranking only sixth from the bottom there. Finally, many more countries show a share of concern close to the EU27 average of 19% resulting in a lower cross-country variance.

As in previous EB studies, we found a clear positive educational gradient in the proportion of people concerned about climate

Fig. 1 - Persons reporting concerns about climate change (in %) – 27 EU countries.

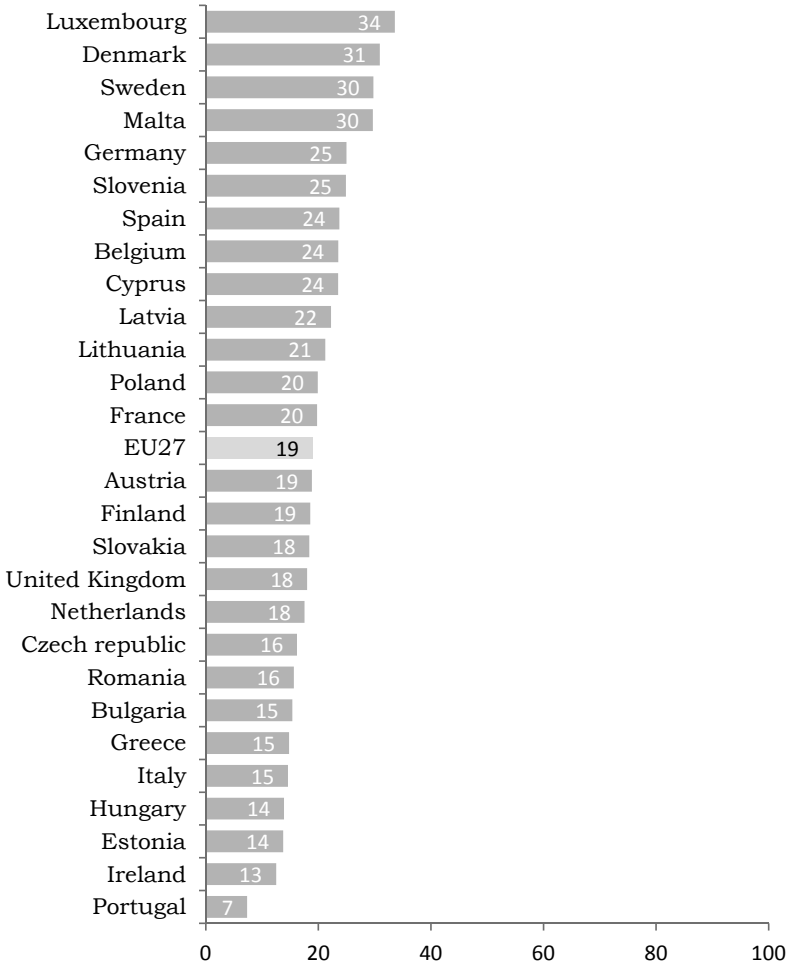
Panel a) Climate change is one of the problems.



change, with those more highly educated being more worried than those less educated. Similar gradients could be observed for the EU27 population as a whole and for each age group, with the only exception of the age group between 25 and 39 (Figure 2, panel a). A positive educational gradient, albeit of a smaller size, could be detected also in the sub-sample of people who considered climate change the major challenge of the future. Moreover, there is an increase in the size of the educational gradient, going from the

Fig. 1 - (Continued).

Panel b) Climate change is the biggest problem.

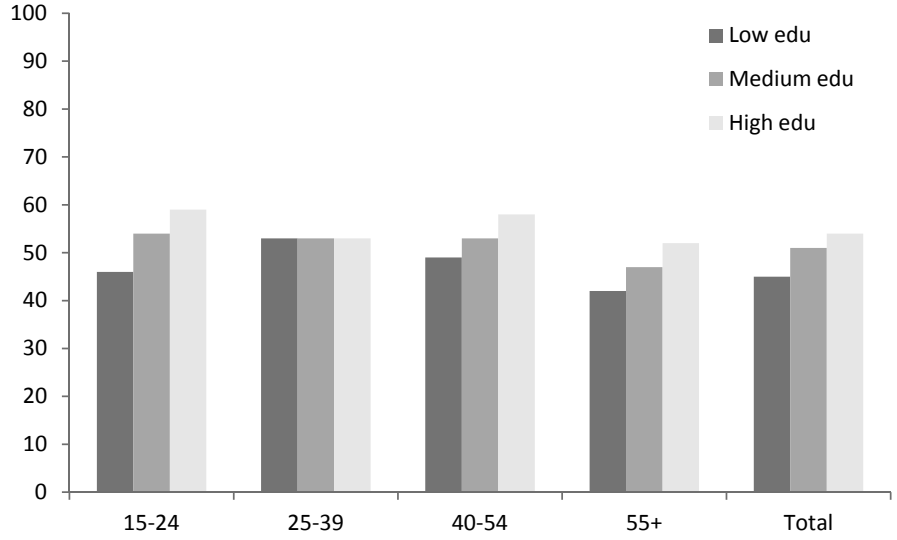


youngest to the oldest age group, while for those who were just generally concerned about climate change, educational differences were more remarkable in the youngest age group than in the oldest ones (Figure 2, panels a and b).

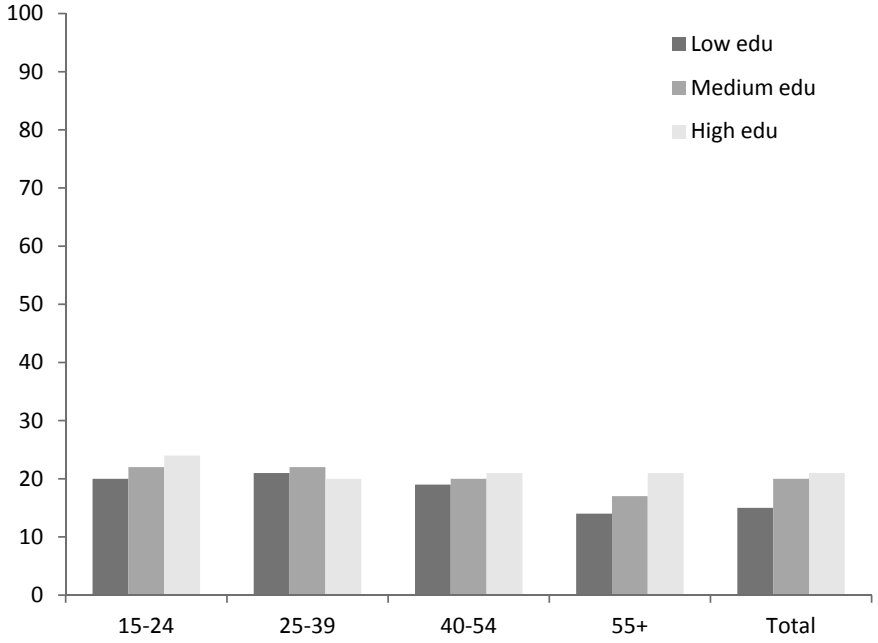
Table 1 reports the bivariate distributions of people worried about climate change by a number of socio-demographic and economic variables. The variables considered include: age, gender, marital status, educational level, employment status, level

Fig. 2 - Persons reporting concerns about climate change by age and level of education (in %) – 27 EU countries pooled together.

Panel a) climate change is one of the problems.



Panel b) Climate change is the biggest problem.



Tab. 1 - Concerns on climate change by socio-demographic variables (%).

	Climate change seen as:		
	Not a problem	One of the problems	The biggest problem
Age			
15-24	44	33	23
25-39	47	32	21
40-54	46	33	21
55+	54	29	16
Gender			
Female	49	32	19
Male	49	31	20
Marital status			
Married	49	32	19
Cohabiting	45	34	21
Single	46	32	22
Separated	56	28	16
Education			
Low	55	29	15
Medium	49	31	20
High	46	34	21
Enrolled	43	33	24
Employment status			
Employed	47	32	21
Unemployed	47	32	21
Inactive	52	30	18
Self-positioning on the social scale			
Low	54	27	18
Medium	48	31	20
High	48	33	19
Very high	56	28	16
Urbanisation			
Rural area	50	30	20
Small town	49	32	19
Large town	48	31	20
Actual number of children			
None	46	32	22
One	48	32	19
Two	50	32	19
Three or more	53	29	18
Additionally intended number of children			
None	50	31	18
One	44	33	23
Two	42	34	23
Three or more	47	31	22
Total	49	32	19

of urbanisation, self-positioning on the social scale, actual and intended number of children. The variables have been coded as follows: The age of respondents is a four-category variable including the age groups 15-24, 25-39, 40-54 and 55+. The marital status takes four categories: single, married, cohabiting and separated. The last category also includes divorced respondents, while married respondents were grouped together with remarried ones. Education was measured through the following question: "*How old were you when you stopped your full-time education?*" The educational level is a three-category variable with low (for those who stopped education before age 16), medium (between 16 and 19 years) and high (20 years or above) attainment. This categorisation reflects the grouping available in the Eurobarometer data. A dummy variable indicating whether respondents were still enrolled in education is also considered. The employment status has three categories: employed, unemployed and people not in the labour market. The self-positioning on the social scale is a four-category variable with 1 corresponding to the lowest level and 4 to the highest level reported[2]. The level of urbanisation is based on people's perception of the area in which they live and takes three categories: rural area, small town and big town. Actual number of children and additionally intended number of children both take four categories: no child, one child, two children, three or more children. The first variable was measured with the question: "*Do you have children? If yes, how many?*" the second variable was measured with the question: "*How many children do you still intend to have?*" which was addressed only to people aged 15-39. As can be seen in Table 1, climate change concerns are more common among the youngest people, those cohabiting or being single, more educated or still enrolled in education, being employed, living in urban areas, either small or large towns, medium self-positioning on the social scale, being childless (or with just one child), but planning to have (more) children in the future (Table 1). These results only offer an insight on the bivariate association between each variable and the key response variable, i.e. climate change. In order to examine the effect of each variable net of the others, we performed a multilevel regression analysis in which the relationship between climate change and

[2] The original ten-point scale was re-coded into one with only four points because some cells had very few cases.

childbearing is controlled for all the socio-demographic and economic variables as well as for the cross-country variance. Results are reported in Table 2, Panel a and b. The model is a random intercept logistic regression model in which the response is a dichotomous variable equal to 1 if people indicated a "concern about climate change" and 0 otherwise (panel a), and equal to 1 if people indicated a "strong concern about climate change" and 0 otherwise (panel b). The estimates (beta coefficients) of the model shown in panel a), reveal a negative and statistically significant effect of age on concerns about climate change: the younger the people are, the more they are concerned about the environment. In addition, people better educated, i.e. with medium to high level of completed education, are more concerned about environmental issues than people with a low education level. Moreover, there is a reverse Ushaped effect of people's self-positioning along the social scale on the worries about climate, with people who see themselves very low or very high on the social scale being the least concerned. Finally, we observe a positive and statistically significant effect of 'living in town' on people's sensitivity to the climate issue. All four effects mentioned above hold also in the model which uses as response variable the respondents' perception of climate change as the biggest problem of the future rather than as just one of the problems (Table 2, Panel b). In this latter model, however, they lose their statistical significance with the only exceptions of education and level of urbanisation which are still highly and statistically significantly correlated with worries about climate change. An interesting result is revealed by the fertility-related variables included in the model of panel b): if climate change is considered the most serious concern of the future, it is also strongly and significantly correlated with both intended and actual childbearing: the larger the intended family size, the stronger the concern about climate change. The effect takes a reverse Ushape, that is, people with one or two additionally planned children are the most concerned groups. Similarly, the effect of actual family size, although positive (sensitivity to climate change is lower among childless people), is not linear but inversely U-shaped, with the category of those with exactly two children (the category chosen as reference in the models) being most concerned about climate. It is worth to be noted that childless people are the group most sensitive to environmental-related

Tab. 2 - Random intercept logistic regression models on people's concern about climate change.

Panel a) Climate change considered to be one of the problems.

	Betas	St errors	P-value
Age (Ref. 55 and above)			
15-24	0.11	0.08	0.15
25-39	**0.09**	0.05	0.06
40-54	**0.14**	0.04	0.00
Gender (Ref. Female)			
Male	-0.04	0.03	0.14
Marital status (ref. Married)			
Single	0.02	0.05	0.69
Cohabiting	-0.01	0.05	0.90
Separated	-0.06	0.04	0.13
Education (Ref. Low education)			
Medium level	**0.19**	0.04	0.00
High level	**0.29**	0.04	0.00
Enrolled in education	**0.46**	0.09	0.00
Employment (Ref. Employed)			
Unemployed	0.00	0.05	1.00
Inactive	**-0.17**	0.04	0.00
Self-positioning in the social scale (ref. Medium)			
Very low	**-0.19**	0.05	0.00
Very high	**-0.26**	0.08	0.00
Urbanization (ref. Rural)			
Small town	**0.08**	0.03	0.02
Large town	0.04	0.03	0.21
Actual number of children (ref. Two children)			
No child	-0.07	0.05	0.15
One child	-0.04	0.04	0.28
Three or more children	-0.06	0.04	0.11
Intended number of children (ref. No additional child)			
One child	0.05	0.06	0.41
Two children	0.09	0.06	0.11
Three or more children	-0.04	0.08	0.62
Constant	0.10	0.09	0.29
Country level variance	**0.18**		
Y==1 13665 (57%)			
Level-one units	24176		
Level-two units	27		

Tab. 2 - (Continued).

Panel b) Climate change considered to be the biggest problem.

	Betas	St errors	P-value
Age (Ref. 55 and above)			
15-24	0.03	0.10	0.75
25-39	-0.02	0.06	0.73
40-54	0.02	0.05	0.66
Gender (Ref. Female)			
Male	0.01	0.03	0.75
Marital status (ref. Married)			
Single	0.07	0.06	0.26
Cohabiting	0.01	0.06	0.84
Separated	-0.02	0.05	0.73
Education (Ref. Low education)			
Medium level	**0.26**	0.05	0.00
High level	**0.29**	0.06	0.00
Enrolled in education	**0.49**	0.11	0.00
Employment (Ref. Employed)			
Unemployed	0.02	0.07	0.81
Inactive	**-0.10**	0.05	0.03
Self-positioning in the social scale			
Very low	**-0.11**	0.06	0.07
Very high	-0.15	0.10	0.12
Urbanization (ref. Rural)			
Small town	0.02	0.04	0.67
Large town	0.01	0.04	0.94
Actual number of children (ref. Two children)			
No child	**-0.11**	0.06	0.07
One child	-0.02	0.05	0.73
Three or more children	-0.07	0.05	0.16
Intended number of children (ref. No additional child)			
One child	0.10	0.07	0.16
Two children	**0.14**	0.07	0.04
Three or more children	-0.03	0.10	0.78
Constant	1.56	0.12	0.00
Country level variance	**0.15**		
Y==1 5225 (22%)			
Level-one units	24176		
Level-two units	27		

Note. Statistically significant coefficients are in bold. The shares of people worried or very worried about climate differ from those given in Table 1 because of different sample size due to missing values in any of the explanatory variables considered.

issues in the bivariate analysis but the least sensitive in the multivariate analysis (the related coefficient is statistically significant at 10% level). This piece of evidence suggests that the positive bivariate correlation is actually spurious, i.e. driven by any of the socio-demographic factors included in the regression models. A look at the other covariates included in the model suggests that concerns about climate are more common among men, single or cohabiting, while they are less common among people separated or divorced, unemployed, or not active in the labour market. These variables, however, do not hold statistically significant effects, with the only exception of being inactive in the labour market. The variance at country level is statistically significant in both models, supporting the choice to use two-level regression models with individuals nested in countries. Furthermore, a decrease in the level of cross-country variance going from the model of panel a) to the one of panel b) points out that the differences across countries are smaller if climate change is considered to be the biggest problem of the future rather than just one of the problems.

6. Concluding remarks

In this study, we have reviewed the research on people's opinions on climate change focusing on Europe. Results based on the EB 2011 survey clearly show a widespread sensitivity of Europeans to the topic related to environment: more than half of all EU citizens perceived the predicted climate change as problematic. In addition, also using the 2011 EB survey data, we investigated the link between people's worries about a future climate change and a number of socio-economic and demographic individuals' characteristics. We found a strong and significant effect of education, i.e. compared to people with a low education level the more educated ones are also more concerned about environmental issues. This implies that increasing the level of education in the population could result in a more effective spreading of environmental awareness.

Another important finding of this study is the statistically significant and positive association between reproductive intentions and behaviours on the one hand, and worrying about the possible

consequences of climate change on the other. This outcome confirms earlier findings on a positive relationship between reproductive preferences and pessimistic views about climate change (De Rose, Testa, 2013). It seems to suggest that most people start to think about the challenge related to climate change when they have are planning to have (or already have) children, probably because they want to pass a healthy and enjoyable environment on to the future, i.e. to their children's generation.

There is not sufficient information in the EB 2011 survey on whether people correctly understand the causes and consequences of climate change, but we could speculate on the basis of our empirical analysis that they no longer see it as something far removed from their daily life or from their 'domestic' issues, as earlier studies have shown. Perhaps this change in the perception of the climate issue is related to the severity, and temporal proximity, of the environmental change. In the past few decades, the topic has been featured prominently in the media because of events like extreme temperatures and floods occurring frequently in several European countries.

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Riassunto: In tutto il mondo sta crescendo la sensibilità sui temi del cambiamento climatico e delle sue conseguenze. È ampiamente riconosciuto che le cause del fenomeno sono in gran parte antropogeniche e legate al peggioramento delle condizioni ambientali. La dimensione dell'impatto sulla popolazione e sulla vita degli individui dipende dalla loro vulnerabilità e, positivamente, dalla loro capacità di resistenza e di contrastare le tendenze in atto. L'uomo, infatti, è in grado di intervenire scegliendo le misure più adeguate. A livello di comunità, è possibile sviluppare nuove tecnologie che consentano di raggiungere elevati standard economici riducendo i rischi per l'ambiente. A livello individuale, le persone più spaventate dai pericoli legati al cambiamento climatico adottano comportamenti più responsabili. Perciò, una questione importante è capire se e quanto le persone siano consapevoli del peggioramento in atto nelle condizioni ambientali del Pianeta e delle sue conseguenze.

In questo lavoro, esaminiamo la diffusione nella popolazione della preoccupazione per il cambiamento climatico in 27 paesi dell'Unione Europea. Utilizzando i dati dell'indagine Eurobarometer 2011 ed adottando un modello di regressione logistica multilivello, abbiamo trovato un grado elevato di eterogeneità nei livelli di consapevolezza tra i diversi paesi e anche, all'interno dei paesi, tra categorie diverse di individui. In particolare, le persone più istruite e quelle che hanno responsabilità familiari o hanno deciso di avere figli in futuro sono quelle più preoccupate dei rischi associati al cambiamento climatico.

Résumé: Partout dans le monde il y a une prise de conscience croissante sur les questions du changement climatique et ses conséquences. Il est largement reconnu que les causes de ce phénomène sont en grande partie d'origine anthropique et liées à la détérioration des conditions environnementales. L'impact sur la population et sur la vie des individus dépend de leur vulnérabilité et, positivement, par leur endurance et par leur capacité de faire face aux tendances existantes. L'homme, en effet, est en mesure d'intervenir en choisissant les mesures les plus appropriées à mettre en œuvre. Au niveau communautaire, il est possible de développer des nouvelles technologies qui permettent d'atteindre des niveaux économiques élevés en réduisant les risques pour l'environnement. Au niveau individuel, les individus plus effrayés par les dangers du changement climatique adoptent un comportement plus responsable. Par conséquent, une question importante est de savoir si et combien de personne sont conscientes de la détérioration continue des conditions environnementales de la planète et de ses conséquences.

Dans cet article, nous examinons la diffusion dans la population d'un certain niveau d'inquiétude lié au changement climatique dans les 27 pays de l'UE. Utilisant des données de l'enquête Eurobaromètre 2011 et adoptant un modèle de régression logistique multiniveaux, nous avons trouvé un haut degré d'hétérogénéité dans les niveaux de sensibilisation entre les différents pays et aussi au sein des pays, entre les différentes catégories de personnes. En particulier, les personne avec un niveau d'éducation élevés et celles qui ont des responsabilités familiales ou qui ont décidé d'avoir des enfants prochainement sont les plus préoccupés par les risques associés au changement climatique.