Is Our House on Fire? Analysis and Prediction of European Attitudes towards Climate Change.

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Object

Nowadays, climate change is one of the substantial issues and challenges that is continuing to grow in intensity and complexity. Understanding the individual environmental attitudes is fundamental to promote citizen engagement in pro-environmental behavior and support green development. Scholars have identified several factors that shape pro-environmental behaviour: sociodemographic, individual, and contextual dimensions. For example, being young, well educated, wealthy, and liberal (sociodemographic dimension) positively influences eco-friendly action. In addition, people who perceive themselves with a green identity and who have a high climate change risk perception (individual dimension) are more likely to behave eco-sustainably with the intention to mitigate and fight the environmental problem. Finally, the country of origin of the citizens and the shared cultural schemas (contextual dimension) could shape pro-environmental behaviour. These cultural schemas control the rules of thinking and, combined with cultural values, may interact with eco-friendly actions However, the literature review suggests that there is a value-action gap. High levels of worry do not always lead to environmental behavior. Sometimes, worried citizens do not perform any pro-environmental behaviours, or unworried citizens act ecologically.

Case of Study

The study focuses on the prediction and classification of the self-reported behaviour (binary outcome: 1=yes-action, 0=no-action) of European citizens. The Special Eurobarometer 91.3 dataset is adopted in order to have an EU representative sample (N=21978), entitled "Climate Change". The dependent variable is pro-environmental behaviour, while the explanatory ones chosen from the survey are climate change risk perception, political orientation, marital status, education, gender, age, residence, social class, and country. Besides, some items about climate change are selected. The questions

deal with different aspects of climate change, such as actors (companies or citizens) who would benefit from the phenomenon being fought and what kinds of strategies (use of renewable energy, improving energy-efficient or reducing greenhouse gas) governments should adopt. By adopting these questions, different types of cultural schemas and self-green identity are built. The primary broader aim is to understand what factors shape pro-environmental behavior. Additionally, the research study aims to better understand the relationship between climate change risk perception and pro-environmental behaviour by investigating more about the value-action gap. Therefore, the second part of the analysis pursues to examine the factors that determine the actions of worried and unworried citizens separately.

Analysis

Before starting the predictions, Correlational Class Analysis (CCA) and Partitioning Around Medoids (PAM) clustering are performed to identify some citizens' profiles. CCA finds some shared cultural schemas among citizens. A cultural schema can control the rules of thinking and interpretation of climate change. PAM clustering partitions citizens into clusters according to similar attitudes toward climate change, which we call green identity. For these algorithms, only variables about climate change issues are adopted. The new created classes are introduced in the final prediction models. Logistic Regression, Decision Tree, Random Forest, and Gradient Boosting are the chosen classifiers. We have decided to use different methods since we want to compare the results obtained and, we want to find an optimal model that best predicts the behavior. Random Forest yields the best results in terms of predictive accuracy (0.69) and macro-F1 (0.65). Climate change risk perception is one of the main important factors in shaping pro-environmental behaviour in all non-parametric models. A high level of individual climate change risk perception positively influences and predicts pro-environmental behaviour. Another relevant factor that shapes pro-environmental behaviour is the extreme green identity. Individuals who have some powerful green values and who share the importance of fighting climate change are more likely to behave ecologically. Finally, some sociodemographic variables: age and high-education are important predictors. The relationship between age and pro-environmental behaviour is not adequately clear in the analysis. In all age groups (except senior citizens), there is a high percentage of individuals who perform some pro-environmental behaviors. Concerning education, the relationship is more comprehensible: higher education has a positive effect on pro-environmental behaviour. Some new interesting findings: living in Eastern countries has a negative effect on pro-environmental behaviour. In the second part of the analysis, we divide the dataset into two subsets: one with only the observations of individuals who have a high-risk perception level (n=19072); and the other one with only the observations of those who have a low-risk perception level (n=2906). Afterwards, we fit these four classifiers separately. The explanatory variables are the same as with the traditional model, but risk perception is excluded. The best model with the subset of worried citizens is Gradient Boosting (accuracy=0.66 and macro-F1=0.64). For this subset, the important variables remain the same as in the previous model. Extreme green identity and higher education have a positive effect on pro-environmental behaviour. Differently from the unworried citizens' subset, the best model is Random Forest (accuracy 0.64 and macro-F1 0.63). In this case, the youngest unworried adults (15-30 years old) and the individuals with a moderate green identity are very likely not behaving ecologically. Lastly, another finding opposite to the sociological literature is made: the unworried adults (30-60 years old) are more likely to behave ecologically than the younger individuals.

Conclusion

The contribution of the dissertation is to find some strategies for promoting citizens' engagement in pro-environmental behaviour. Public policy should encourage education or information about climate change to increase risk perception and to create an extreme green identity. All these factors lead to an active engagement of European citizens. A limitation concerns data availability and the impossibility to insert all explanatory variables (especially those relating to contextual factors). Institutional, economic, and socio-cultural factors are not completely examined. Future research could create a model with all the dimensions' factors, joining different datasets. Lastly, predictions of the behaviour could be divided according to the country to examine strategies at a national level to promote pro-environmental behaviour.