

**Charles University
Faculty of Arts**

Department of Sociology
Sociology Programme

PhD Thesis Propositions



Iva Zvěřinová

Public Preferences for Environmental Policies and Behavioural Changes

Preference veřejnosti pro politiky a změny chování ve vztahu k životnímu prostředí

Thesis supervisor: PhDr. Jiří Vinopal, Ph.D.

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Abstract

Environmental problems, such as climate change, are generally perceived as serious issues by the public in European countries. However, people tend to assign them a low policy priority and disagree with the introduction of some policy instruments, such as carbon tax. Few people also behave in an environmentally friendly way and reduce greenhouse gas emissions. What are the preferences of the inhabitants of several European countries regarding climate mitigation policies and behavioural changes? What makes these policies more acceptable for the public? Would people from these countries be willing to accept climate mitigation policies or behaviour, and if so, under what conditions? This thesis aims to answer these questions by applying a theoretical framework that integrates attitudes and perceptions with preferences.

In the empirical part of the thesis, we analyse data from several questionnaire surveys on public responses to climate policies and climate-related behaviours in several European countries. The thesis contains four empirical studies focusing on: i. public preferences for climate mitigation policies; ii. public preferences for policy instruments to reduce GHG emissions; iii. consumers' preferences for electric vehicles; iv. consumers' preferences for more sustainable and healthier lifestyles. All the empirical studies use discrete choice experiments in order to evaluate the changes in preferences of people upon the implementation of a new policy or provision of information and to predict consumers' behaviour with respect to new goods or lifestyle changes. Furthermore, the objective is to examine the effects of attitudinal factors and sociodemographic characteristics on these preferences using a hybrid choice model, which is quite novel in sociological research.

Keywords:

public opinion, preferences, environmental policies, climate change, mitigation, environmentally significant behaviour, electric vehicles, dietary changes, discrete choice experiment

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1 AIM AND STRUCTURE OF THE THESIS

The thesis contributes to the understanding of public preferences for climate change mitigation, specifically public responses to climate policies and private-sphere behaviours. The objective is to answer to main research questions: 1) What are the preferences of the inhabitants of several European countries regarding climate mitigation policies and behavioural changes?; 2) What makes climate mitigation policies or behavioural changes more acceptable for people from the surveyed European countries? (Chapter 1).

To explain preferences for climate change mitigation, we develop a theoretical framework and apply it to the analysis of three datasets. The goal of developing a theoretical framework of public engagement in climate mitigation is to be able to account for both attitudes and preferences (Chapter 2). The framework is empirically tested on a variety of different, yet related, cases of mitigation behaviours and policies, as well as comparing the Czech Republic and other countries from the European Union (EU).

Concerning methodology (Chapter 3), the thesis tries to advance the use of stated preference methods in surveys, which overcome some measurement problems prevalent in the current research. Public responses to environmental policies are often measured as evaluations of general policy proposals or governmental actions. Citizens may agree with the general policy principle but may dislike the specific policy meant to implement the principle in practice. The method of stated preference and, specifically, Discrete Choice Experiments (DCE) allow researchers to define and vary policy specific attributes within diverse contexts, and to model respondents' preferences for these attributes and their combinations. Thus, using the combination of attitudinal constructs and stated-preference approach, the data analysed within the thesis provide more realistic results.

The results of the data analysis are presented in four empirical studies in Chapter 4. The first study identifies the difference between positive general attitudes to the EU emissions reductions targets and willingness to bear the costs of increased prices of products and services due to emission reductions in the United Kingdom (UK), Czech Republic and Poland. The objective is to detect whether the policy can be designed in a way that will be more publicly acceptable. Are the distributional impacts of climate policies a matter of concern for the public? How should the costs be distributed? Which segments of the population tend to accept greenhouse gases (GHG) emission reductions?

The second empirical study examines public preferences for policy instruments to reduce GHG emissions. It focuses on the acceptability of emissions taxes and revenue recycling options. Which GHG emissions reduction policy instruments are preferred by the public in the UK, Czech Republic, and Poland? Which segments of the population tend to accept particular policies? Would revenue recycling increase public acceptability of climate mitigation policies? What type of revenue recycling is favoured by the public?

In addition to public policies, the adoption of technological solutions and lifestyle changes of consumers will have an important role in climate change mitigation. Transport and food are two of the three main areas responsible for 70% of the environmental impacts in most categories of household consumption (Tukker and Jansen, 2006). Thus, we analyse consumers' preferences for electric vehicles in the third study and consumers' preferences for more sustainable and healthier lifestyles in the fourth. What features of electric vehicles need to be improved? Which segments of the population show a greater preference for electric vehicles? Would people be willing to change their dietary patterns or physical activity to lead a healthier and more sustainable lifestyle, and if so, under what conditions?

The thesis ends with a discussion of the the theoretical framework, methods, and provides policy implications (Chapter 5).

2 BRIDGING DIFFERENT APPROACHES: AN INTEGRATED THEORETICAL FRAMEWORK

While economists have worked with the concept of preferences in order to determine what people value, sociologists and psychologists have used the attitude concept (Liebe et al. 2011). A theoretical framework that integrates these concepts has been proposed by McFadden (2001) and operationalised as a hybrid choice model that allowed the integration of latent variables, such as attitudes and perceptions, in choice models (Walker, Ben-Akiva, 2002). The theoretical foundation is rational choice theory. However, a hybrid choice model goes beyond the basic random utility model and it encompasses not only perceptions, but information processing and cognitive processes as well (Walker, Ben-Akiva, 2002). A hybrid latent class choice model now allows, in accordance with sociological action theories, a theory-based testing of preference segmentation by attitudes (Liebe et al., 2018).

We build upon these theoretical and methodological developments and adapt the theoretical framework to explain public preferences regarding climate mitigation. This framework allows us to segment the preferences of people for specific policies and policy characteristics according to attitudinal constructs and sociodemographic characteristics. In this thesis, we elicit the preferences using discrete choice experiments in stated preference surveys. Although there are already a few sociological empirical studies that utilize discrete choice experiments, this technique is still quite novel for most sociologists, but potentially very useful (Liebe et al., 2018).

3 METHODS AND DATA

The core of the thesis is a quantitative analysis of existing questionnaire surveys of inhabitants of several EU countries. The questionnaires combine attitudinal scales and stated preference techniques, specifically discrete choice experiments. We use individual-level data from three surveys to test our hypotheses.

The first survey examines public preferences for climate mitigation policies and policy instruments. It was carried out in the Czech Republic, the UK, and Poland. These countries have been selected based on their different political stances in the European climate policy debate and distinct national contexts for comparison. Web-based instruments were chosen to interview almost 5,500 respondents.

The second survey pertains to consumers' preferences for electric vehicles in Poland. Two specific populations were targeted: respondents who intend to buy a passenger car within the next three years and representative of the general population of Poland. The final dataset includes the answers from 2,156 respondents. We considered only those who intend to buy a car and who responded to the choice questions.

The third survey is about consumers' preferences for more sustainable and healthier lifestyles. The questionnaire survey was conducted in the Czech Republic, Latvia, Portugal, Spain, and in the UK. The five countries were selected based on their different political and socio-economic contexts for comparison. The final dataset consists in a total of 10288 observations.

All our surveys were conducted with quota sampling, data collection (online access panels except the first survey in which both computer assisted personal and web interviews were used in case of Poland and the Czech Republic), and measurement strategies. The instruments in all surveys include discrete choice experiments and questions allowing the measurement of socio-psychological and sociodemographic characteristics. All the surveys comprised three phases: qualitative pre-survey, pilot and main wave of data collection.

4 PUBLIC PREFERENCES FOR CLIMATE MITIGATION POLICIES

The first empirical study of this thesis deals with topic of public preferences for climate mitigation policies. Using discrete choice experiments, it examines the public acceptability of the EU's future climate mitigation policies by the Czechs, British, and Poles.

Public acceptability of policies is influenced by at least two types of factors and their interactions: individual characteristics and characteristics of the policy. The effects of policy characteristics are interlinked with social-psychological variables and hence the individual characteristics of the respondent (Kim, Schmöcker, Fujii, & Noland, 2013).

We designed a discrete choice experiment containing four attributes. The first three attributes described the policy: emissions reduction target for the European Union, distribution of costs among the European Union countries, and cost distribution among the citizens of the given country. We introduce several allocation principles to determine claimant's share in decisions following work by Young (1994). The fourth attribute was the increased monthly costs to the respondent's household, which allows us to estimate the willingness to pay (WTP) for each level of the policy attributes.

The results reveal stark differences between the countries. Citizens of the Czech Republic and the UK are generally supportive of the prospected climate policy, while the Poles prefer the status quo policy to any new policy option. The reason for different preferences among examined countries might be a different political and socioeconomic situation of the examined countries.

Regarding the preferences for burden sharing rules among the EU countries, the Czech Republic and the UK significantly prefer the distribution of policy costs based on the GHG emissions of the EU countries to linear to wealth or per-capita based rules. In contrast, Polish households are not so eager to implement emission based burden-sharing among countries.

Concerning the distribution of policy costs within a country, respondents from all surveyed countries are in favour of implementing the polluter-pays principle.

Regarding the cost allocation scheme, the 'green' class strongly preferred the cost distribution linked to emission levels in each country. The 'modest' class in the UK and in the Czech Republic shared preferences for cost distribution with the 'green' class. The 'against' classes in Poland and the UK were found to be indifferent for the cost allocation rules. Less educated respondents are more likely to be in 'against' class in each country.

Beliefs about the commitment to be made by other countries in the world to reduce their emissions adequately may affect preferences and hence willingness to pay for a given policy. Half of the Czech respondents, 44% of British respondents and 36% of Polish respondents doubt that other countries in the world will reduce their emissions adequately.

The acceptability of climate policy depends on the distribution of policy costs both among citizens of the country and among countries of the EU. There is a clear preference for distribution based on emissions in both instances in the UK and the Czech Republic, which lends support to previous conclusions about a preference for the polluter-pays principle (Carlsson et al., 2013; Dietz & Atkinson, 2010; Schleich, Dütschke, Schwirplies, & Ziegler, 2016).

5 PUBLIC PREFERENCES FOR POLICY INSTRUMENTS TO REDUCE GHG EMISSIONS

The second empirical study deals with public preferences for policy instruments to reduce GHG emissions. Respondents from the Czech Republic, Great Britain, and Poland who feel they know more about the climate change are less likely to choose the status quo (20% reduction by 2020) than 80% reduction by 2050.

Our results show that the Czechs prefer removal of harmful subsidies and subsidy provision to taxes, which is in accordance with previous studies (Carattini, Carvalho, and Fankhauser, 2017a). The preferences of the British and the Poles, however, differ significantly from preferences of Czechs. The British are strongly in favour of the emission trading system in comparison to taxes. The Poles are in favour the emissions trading system and providing bans and technological standards followed by removal of harmful subsidies.

Although carbon tax is an unpopular instrument, it is worth trying to increase its acceptability, as it is a cost-effective way to reduce greenhouse gas emissions (Baranzini, Goldemberg, Speck, 2000). One of the important reasons for the unpopularity of carbon taxes is related to public concern about regressive impacts of carbon tax (Carattini, Carvalho, and Fankhauser, 2017a). The potential regressive effects of carbon tax can be compensated through redistribution of the generated fiscal revenues. If the revenues are returned back to the population in the form of ‘carbon dividends’, carbon taxes can be even progressive (Rooney et al., 2018). However, looking at environmental policies implemented in real conditions, revenues from carbon taxes are not always recycled, but are absorbed into the government’s general budget, such as in France (Berry, 2019)

In all surveyed countries, using the revenues according to the current spending structure was seen as the least attractive, which is in accordance with the previous study by Bristow and her colleagues (2010). Revenue use in accordance with public preferences could improve public acceptability of climate mitigation policies in the Czech Republic and the UK.

Earmarking revenues for environmental measures would increase public acceptability (as found also by Sælen and Kallbekken, 2011; Carattini, Carvalho, and Fankhauser, 2017a), albeit only in the Czech Republic. The large differences among countries prevent us from making a general recommendation regarding the public acceptability of revenue use. While the British would support using the revenues for public services (such as public health or education) and reducing public debt, Czechs prefer environmental projects, public services and reducing current taxes the most. In Poland, the preferences for instruments that generate additional budget revenues were the weakest. Furthermore, the Poles dislike using revenues according to current allocation and increasing spending on environmental protection.

The Czechs who think they know more about the climate change are also willing to pay more for emission reduction policies, which incorporate using permits as instruments and in favour of spending the recycled revenues on research and development.

The British who claim they are more knowledgeable about the climate change have stronger preferences for the removal of harmful subsidies and spending the revenues on environmental protection. Those who are more aware of the negative climate change impacts are also more than average in favour of removal of harmful subsidies and even less likely to choose the status quo (corresponds to findings by Steg, Dreijerink, and Abrahamse, 2005; Harring and Jagers, 2013), but in terms of revenue recycling they prefer research and development, social problems, public services, and public debt.

Special attention should be paid to the communication of climate change policy design to the Polish public, as the Poles are, contrary to the Czechs and the British, on average not

willing to financially contribute to a stricter GHG reduction policy. Moreover, the Poles' awareness of climate change impacts seems to be different from the awareness of inhabitants of the other countries. The Poles' awareness can be interpreted as not only dis-concerns for the climate change effects, but also a measure of misunderstanding of its effects or scepticism. This can be seen through the positive association with the belief that it is more likely that climate changes can lead to savings on healthcare (interestingly, not on heating), increased food production or new opportunities for business. The sceptics' choices of the status quo (20% reduction by 2020), however, do not seem to significantly differ from the other respondents.

6 CONSUMERS' PREFERENCES FOR ELECTRIC VEHICLES

In recent years, stated preference methods have been used to study preferences for alternative fuel vehicles, particularly in the USA, Canada, Asia, and Western Europe (see Liao et al. 2017 for a comprehensive review). However, when this study was published (Ščasný, M., Zvěřinová, I., & Czajkowski, M., 2018), there were no studies available for Eastern Europe, which differs from the West with respect to the development of the alternative fuel vehicles market, economic conditions, and culture.

Thus, the third empirical study examines consumers' preferences for electric vehicles. Specifically, we analyse preferences of Polish consumers who intend to buy a passenger car for several specific attributes of electric driven passenger vehicles, specifically hybrid, plug-in hybrid, and battery electric vehicles.

Even under a public program that would enable slow-mode charging in places where respondents usually park, Polish car buyers prefer electric driven vehicles significantly less than conventional vehicles. However, decreasing the purchase price and operating costs, developing technologies that increase the driving range, and decreasing charging time can all serve to strengthen preferences for electric vehicles. In addition, the deployment of charging infrastructure can encourage the spread of battery electric vehicles in particular.

Recharging time and the availability of charging stations are currently the most influential barriers to increasing the market share of plug-in electric vehicles. Preferences for electric driven vehicles increase sharply when the availability of fast-mode recharging improves from a low level to a medium level or even to a high level.

The results of the mixed logit models indicate that consumer preferences for electric driven vehicles and their characteristics are highly diverse. We find that respondents' location is an important driver of their preferences towards electric vehicles. Consumers living in rural areas appear significantly more sensitive to the charging time of a plug-in hybrid and operating cost.

Based on our findings, we propose several ways to promote greater uptake of electric vehicles in Poland. First, installation of battery charging infrastructure and increasing the visibility of charging stations need to be supported. Second, from the consumer perspective, support for research and development should focus on improving driving range and battery charging. Third, alternative mobility options for "long journeys", e.g. public transport, various forms of car sharing or pooling systems, and deployment of autonomous driving need to be promoted.

7 CONSUMERS' PREFERENCES FOR MORE SUSTAINABLE AND HEALTHIER LIFESTYLES

The fourth empirical study tackles consumer's preferences for sustainable and healthier lifestyles. Current diets of inhabitants of the EU often contain a large number of animal products, highly processed foods and little fruit and vegetables. This type of diet has large negative health and environmental impacts. The aim of this part is to examine ways to promote transition to healthy and sustainable lifestyles.

Our survey results document current unsustainable unhealthy physical inactivity and unhealthy dietary choices. We found that most respondents prefer to keep eating meat, even though we informed them that plant-based eating is recognised not only as nutritionally sufficient but also contributes to reducing the risk of many chronic illnesses, and that the recommended number of portions of meat per week is a maximum of five.

The cost of the lifestyle program is the key factor of people's choice. The lower cost, the higher the likelihood of choosing the healthier lifestyle. The effect of price change below and above the cost of the current lifestyle is asymmetric in some countries.

Several studies have demonstrated that self-affirmation interventions improve education, health, and relationship outcomes and that the positive effects can last for months and years (Cohen & Sherman, 2014). Hence, we hypothesize that self-affirmation can mitigate negative responses when challenging respondents' current diets by providing information on the health risks of dietary choices.

Indeed, results of our data analysis show that the self-affirmation treatment and providing additional information on environmental impacts both enhance respondent's likelihood of changing their lifestyle, but this effect is not systematic across countries and attributes. Health risk reduction significantly increases the probability of accepting a new alternative lifestyle in all countries.

8 CONCLUSIONS AND DISCUSSION

Citizens may support policies or even adapt their values to those embodied by policies, institutions, and overall governmental discourse (Hoff-Elmari, Bardi, Matti, & Östman, 2014; Svallfors, 2010). However, they may also oppose or reject some policies, which may reduce policy feasibility and result in not proposing or implementing effective policies or their failure (see for example Crowley, 2017). For example, introduction of carbon-energy taxation failed several times, such as carbon taxation in France in 2010. Although it was subsequently launched, the controversies related to carbon tax in France continued and escalated in 2019. The “yellow vest” movement forced Macron’s government to place a six-month moratorium on a diesel tax that was supposed to enter into force in January 2019.

Although climate change is generally perceived as an important issue by the public in European countries (Capstick, Whitmarsh, Poortinga, Pidgeon, & Upham, 2015), people sometimes assign a low policy priority to this issue (Leiserowitz, 2006). Even if climate policy is supported in principle, it can face opposition or rejection by the public once translated into specific policy instruments and proposals that would directly affect citizens’ behaviours and daily routines, the so called “principle-implementation gap” (see Krosnick & MacInnis, 2013).

For these reasons, we investigated factors influencing willingness to accept climate mitigation policies and behavioural changes. We focused on three types of changes: i) public acceptability of climate mitigation policies, ii) adoption of electric vehicles, iii) lifestyle changes focused on diet and physical activity to be not only more sustainable but also to be healthier. In the last chapter, we discuss several policy implications of our findings.

Public acceptability of policies in the UK, the Czech Republic and Poland to reach the EU’s GHG emission reduction targets may be raised by: taking into account distributional consequences, especially introducing the distribution of costs based on the emissions of the EU Member States and of people (implementing the polluter-pays principle); using the policy instruments preferred by citizens of a given country; removal of harmful subsidies and subsidy provision for the Czech Republic; the emissions permit system for the UK and Poland; providing bans and technological standards, harmful subsidy removal for Poland; earmarking the revenues for public services (such as public health or education) and reducing public debt in the UK, for environmental projects, public services and reducing current taxes in the Czech Republic; creating a public communication campaign that would try to strengthen familiarity and self-confidence of knowledge about the climate change consequences and mitigation options.

Regarding adoption of electric vehicles in Poland, we propose that decreasing the purchase price and operating costs, developing technologies that increase the driving range, and decreasing charging time can all serve to strengthen preferences for electric vehicles. In addition, the deployment of a charging infrastructure can encourage the spread of battery electric vehicles in particular. These results correspond to conclusions of a recent comprehensive review (Cansino, Sánchez-Braza, & Sanz-Díaz, 2018), which found that the most important government measures to promote electric cars are taxes and support for the construction of charging stations, accompanied by subsidies for the purchase of electric vehicles, research and development, according to a recent comprehensive review. From perspective of the Polish consumers, support for research and development should focus on improving driving range and battery charging. Alternative mobility options for “long

journeys”, e.g. public transport, various forms of car sharing or pooling systems, and deployment of autonomous driving need to be promoted.

Another important behavioural change that would mitigate climate change could be dietary changes (Oonincx & Boer, 2012). However, our research aimed to provide insight into acceptability of dietary changes that would be not only more sustainable but healthier as well. Based on our results from the UK, the Czech Republic, Latvia, Portugal, and Spain, policies that would subsidise fruit, vegetables and pulses, and impose a sugar tax (or keep the existing sugar tax, in case of the UK and Portugal), complemented by information on health risks, would promote healthier and more sustainable diets, while being publicly acceptable. There is a good evidence from plenty of other studies that soft drink taxes and healthy food subsidies are most effective in triggering consumption change (for systematic reviews see Andreyeva, Long, & Brownell, 2010; Thow, Downs, & Jan, 2014).

However, we need to acknowledge some limitations of the stated preference approaches that we use in the empirical studies. First, we present a contingent scenario using stated preference methods to analyse choices in hypothetical situations. The hypothetical nature of the stated preference approaches may lead to “hypothetical bias”.

Second, since we analyse cross-sectional data from stated preference surveys, we can’t analyse the effects of real time variant changes on actual real behaviour or actual referenda votes. From a socio-psychological perspective, the willingness-to-pay measure may be viewed as a behavioural intention rather than behaviour itself (Ajzen, 1991). Acknowledging this parallel, when we conclude that people are willing to change a specific behaviour (for example to increase their consumption of fruit and vegetables) or accept a mitigation policy under specific conditions, we need to take into account that they might still fail to realize their intention.

ABOUT THE AUTHOR

IVA ZVĚŘINOVÁ

• POSITIONS

- (2008–Present) Research fellow at the Charles University Environment Center
- (2016–Present) External research fellow at the Economics Institute of the Czech Academy of Sciences, CERGE-EI
- (2014–2016) Project researcher at the Industrial Economics, Cambridge, USA
- (3–9/2007) Research assistant at the Institute of Sociology of the Academy of Sciences of the Czech Republic
- (2006–2007) Head of Library of Sociology, Faculty of Arts, Charles University

• TEACHING

- (2009–present) Environmental Sociology, Department of Sociology, Faculty of Arts, Charles University
- (2010) Introduction to Environmental Sociology, Department of Social and Cultural Ecology, Faculty of Humanities, Charles University

• EDUCATION

- (2011–present) PhD in Sociology, Faculty of Arts, Charles University, Czech Republic
- (2004–2011) Master in Sociology, Faculty of Arts, Charles University, Czech Republic

• TRAINING

- (Aug 2014) Groningen Energy Summer School 2014 Smart Grids from a Global Perspective: bridging old and new energy systems, University of Groningen, Netherlands
- (May 2012) Course on 'Stated preference methods - state of the art modeling', SLU, the Swedish University, Sweden
- (2007/2008) Ludwig-Maximilians-Universität München, Department of sociology, Germany

• RESEARCH PROJECTS (involved in last 5 years)

- INter-sectoral Health Environment Research for InnovaTions (Horizon 2020, 2016-2019)
- Frontiers in Energy Efficiency Economics and Modelling (Czech Science Foundation, EXPRO-excellence in basic research, 2019–2023)
- Improving predictive validity of valuation methods by application of an integrative theory of behaviour (Czech Science Foundation, 2015-2017)
- Systematic user support of electromobility development (TA ČR, 2016-2017)
- Support of information exchange and education about the impact of climate change and adaptation measures on national and regional level (European Environmental Agency, 2015-2016)
- The economics of climate change adaptation (EC FP7, 2013-2016)
- Choosing Efficient Combinations of Policy Instruments for Low-carbon development and Innovation to Achieve Europe's 2050 climate targets (EC FP7, 2012–2015)
- Health Valuation Study of Socio-Economic Benefits Improving Fertility and Birth Outcomes (Health Canada, 2014-2015)
- Stated-preference study to examine the economic value of benefits of avoiding selected adverse human health outcomes due to exposure to chemicals in the European Union (European Chemistry Agency, 2012-2013)
- Public health impacts in urban environments of greenhouse gas emissions reduction strategies (EC FP7, 2011–2014)

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