Online Supplement

for

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Appendix A1: OLS Regression Models Predicting Perceived Seriousness of Climate Change

Country	Political Ideology	Gender	Age	Full-Time Education	Perceived Understanding	Sample Size	Adjusted R^2
Austria	.00	.08*	-.01	-.07	.15*	1000	.02
Belgium	.10*	.05	-.04	.04	.19*	1003	.06
Bulgaria	-.02	.05	.05	-.02	.31*	1000	.09
Cyprus	-.06	.08	.10*	.04	.03	504	.01
Czech Republic	.09*	.05	-.00	-.00	.07*	1014	.01
Denmark	.19*	.08*	-.02	.01	.10*	1005	.05
Estonia	-.01	.19*	-.02	-.01	.13*	1006	.04
Finland	.14*	.13*	-.08*	.17*	.21*	1004	.13
France	.07*	.00	-.04	-.01	.10*	1040	.01
Germany	.09*	.12*	.05	.05*	.08*	1534	.03
Greece	-.02	.06	.02	.06	.04	1000	.00
Hungary	-.07*	.01	.05	-.07*	.18*	1000	.03
Ireland	.07*	.05	-.09*	-.01	.19*	1004	.05
Italy	-.03	.05	.06	.01	.21*	1022	.04
Latvia	-.10*	.04	.05	.01	.07*	1008	.02
Lithuania	.05	.04	.01	.01	.19*	1021	.03
Luxembourg	-.06	.05	-.03	.01	.07	501	.00
Malta	-.03	.02	.03	-.02	.27*	500	.06
The Netherlands	.18*	.05*	.05*	.10*	.03	1041	.05
Poland	-.06	.05	-.02	-.07*	.13*	1000	.02
Portugal	.05	.04	-.04	.09*	.05	1001	.02
Romania	-.06*	.03	.07	-.03	.12*	1019	.02
Slovakia	.01	.02	.03	.03	.16*	1085	.02
Slovenia	.02	.06*	.05	-.03	.22*	1003	.05
Spain	.06	.11*	-.08*	-.02	.15*	1033	.04
Sweden	.05	.19*	-.06	.06	.18*	1007	.08
United Kingdom	.11*	.07*	-.13*	.08*	.08*	1306	.06

Notes: Entries are standardized coefficients. The post-stratification weight factor is used for the individual country samples. These models also include a dichotomous indicator of questionnaire version: "global warming" (0) versus "climate change" (1). For space reasons, we do not present a column for these coefficients. This variable only has a statistically significant effect in one country. Czech Republic respondents believe that climate change is more serious than global warming.

* $p<.05$

Appendix A2: OLS Regression Models Predicting Acceptance of Anthropogenic Climate Change Index

Country	Political Ideology	Gender	Age	Full-Time Education	Perceived Understanding	Sample Size	Adjusted R^2
Austria	.04	.06	-.01	.06	.11*	1000	.02
Belgium	.08*	.11*	-.09*	.15*	.19*	1003	.10
Bulgaria	-.05	.01	-.06*	.11*	.31*	1000	.14
Cyprus	.03	.00	.07	.27*	.11*	504	.08
Czech Republic	.01	.01	-.01	.02	.06	1014	.00
Denmark	.20*	.16*	-.06*	.06	.10*	1005	.09
Estonia	.02	.11*	-.15*	.06	.12*	1006	.05
Finland	.12*	.14*	-.12*	.16*	.28*	1004	.18
France	.10*	.03	-.02	.23*	.08*	1040	.08
Germany	.10*	.09*	.01	.11*	.11*	1534	.04
Greece	.05	.04	.05	.03	.15*	1000	.02
Hungary	-.02	.03	-.03	.01	.28*	1000	.08
Ireland	.10*	-.01	.01	.09*	.09*	1004	.02
Italy	.08*	.02	.03	-.00	-.02	1022	.00
Latvia	-.08*	.04	-.03	.10*	.14*	1008	.04
Lithuania	-.01	.05	-.12*	.08*	.19*	1021	.08
Luxembourg	-.09	.05	-.09	.07	.13*	501	.03
Malta	-.05	.04	.13*	.17*	.15*	500	.06
The Netherlands	.20*	.04	-.06*	.01	.04	1041	.05
Poland	-.01	.06*	-.03	.09*	.17*	1000	.05
Portugal	.01	.02	-.02	.11*	.05	1001	.02
Romania	-.01	-.02	-.00	.04	.12*	1019	.01
Slovakia	-.03	.05	-.00	.11*	.13*	1085	.03
Slovenia	.05	.00	-.00	.06	.17*	1003	.03
Spain	-.01	.03	-.04	.02	.20*	1033	.05
Sweden	.07*	.14*	-.09*	.13*	.21*	1007	.10
United Kingdom	.11*	.06*	-.07*	.14*	.07*	1306	.06

Notes: Entries are standardized coefficients. The post-stratification weight factor is used for the individual country samples.

* $p<.05$

Appendix A3: OLS Regression Models Predicting Beliefs about Fighting Climate Change Index

Country	Political Ideology	Gender	Age	Full-Time Education	Perceived Understanding	Sample Size	Adjusted R^2
Austria	-.01	.05	-.01	.04	-.10*	1000	.01
Belgium	.04	.07*	.03	.17*	.03	1003	.03
Bulgaria	.05	-.03	-.04	.07*	-.02	1000	.00
Cyprus	-.03	.10*	.06	.12*	-.01	504	.01
Czech Republic	-.03	-.01	.05	-.01	-.12*	1014	.02
Denmark	.23*	.07*	-.09*	-.00	.01	1005	.07
Estonia	-.00	.09*	-.03	.04	-.10*	1006	.02
Finland	.14*	.16*	-.01	.11*	.03	1004	.05
France	.09*	.01	-.00	.09*	-.07*	1040	.02
Germany	.10*	.13*	-.00	.13*	-.06*	1534	.04
Greece	.17*	.15*	.05	.05	-.05	1000	.05
Hungary	-.07*	.02	.01	.05	-.05	1000	.00
Ireland	.08*	-.02	-.02	.08*	-.18*	1004	.04
Italy	.02	.02	.06	.05	-.13*	1022	.02
Latvia	.00	.07*	.09*	.07*	-.10*	1008	.02
Lithuania	-.00	.03	.05	.07*	-.03	1021	.00
Luxembourg	.02	-.02	.03	.13*	-.14*	501	.02
Malta	.06	.09	.10*	.13*	-.21*	500	.06
The Netherlands	.23*	.10*	.01	.08*	-.04	1041	.08
Poland	-.02	.04	.03	-.03	-.12*	1000	.02
Portugal	.03	.06	-.02	.08*	-.17*	1001	.03
Romania	-.02	-.04	.02	-.03	-.12*	1019	.02
Slovakia	-.04	.01	-.04	.11*	-.21*	1085	.05
Slovenia	.09*	.06	.10*	.06	.08*	1003	.02
Spain	-.08*	.07*	-.04	-.07*	-.17*	1033	.05
Sweden	.10*	.11*	-.05	.08*	-.01	1007	.03
United Kingdom	.10*	.06*	-.06*	.08*	-.08*	1306	.03

Notes: Entries are standardized coefficients. The post-stratification weight factor is used for the individual country samples.

* $p<.05$

Appendix A4: OLS Regression Models Predicting Personal Willingness to Pay to Fight Climate Change

Country	Political Ideology	Gender	Age	Full-Time Education	Perceived Understanding	Sample Size	Adjusted R^2
Austria	-.00	.04	.02	.11*	.15*	776	.04
Belgium	.05	.04	-.09*	.13*	.14*	892	.06
Bulgaria	-.04	.00	-.11*	.18*	.24*	602	.14
Cyprus	-.06	.04	-.12*	.01	.22*	362	.06
Czech Republic	-.02	-.10*	-.15*	.09*	.17*	672	.09
Denmark	.16*	-.02	-.23*	.10*	.04	879	.10
Estonia	-.11*	-.03	-.15*	.13*	.20*	715	.13
Finland	.10*	.00	-.20*	.16*	.10*	843	.11
France	.07*	-.08*	-.13*	.19*	.07*	828	.10
Germany	.06*	.01	-.02	.24*	.19*	1298	.12
Greece	-.02	-.04	-.11*	.06	.23*	866	.09
Hungary	-.01	-.01	-.12*	.14*	.16*	712	.09
Ireland	.02	-.02	-.02	.19*	.23*	580	.10
Italy	.13*	.01	.02	-.01	.35*	578	.13
Latvia	-.02	.08*	-.13*	.08*	.15*	700	.05
Lithuania	-.03	-.01	-.15*	.13*	.14*	755	.08
Luxembourg	-.03	-.01	-.04	.19*	.12*	331	.04
Malta	-.14*	.01	-.05	.16*	.21*	314	.12
The Netherlands	.11*	-.06	-.07*	.06	.10*	908	.03
Poland	.02	-.00	-.08	.16*	.16*	697	.09
Portugal	-.02	-.03	-.13*	-.08	.20*	585	.06
Romania	-.08	.02	-.06	.16*	.16*	798	.09
Slovakia	-.08*	-.01	-.15*	.15*	.15*	720	.09
Slovenia	-.00	-.04	-.11*	.09*	.17*	843	.06
Spain	.06	.04	-.12*	.13*	.25*	652	.14
Sweden	.08*	-.03	-.20*	.12*	.04	839	.06
United Kingdom	.05	-.02	-.06	.25*	.14*	1001	.11

Notes: Entries are standardized coefficients. The post-stratification weight factor is used for the individual country samples.

* $p<.05$

Appendix A5: OLS Regression Models Predicting Support for EU GHG Emission Reduction Policies Index

Country	Political Ideology	Gender	Age	Full-Time Education	Perceived Understanding	Sample Size	Adjusted R^2
Austria	-.03	.07*	.02	-.03	.06	1000	.00
Belgium	.08*	.05	-.06	.06	.04	1003	.02
Bulgaria	.05	.07*	.01	-.03	.04	1000	.00
Cyprus	.05	-.07	.04	-.05	-.00	504	.00
Czech Republic	.04	.03	.03	.03	-.12*	1014	.02
Denmark	.18*	-.02	-.04	.05	.08*	1005	.04
Estonia	-.01	.10*	-.03	.01	-.01	1006	.01
Finland	.09*	.08*	-.15*	.08*	.08*	1004	.06
France	.09*	-.07*	.03	.08*	.04	1040	.02
Germany	.10*	.05*	-.02	.01	-.03	1534	.01
Greece	.04	.04	.04	.01	.14*	1000	.02
Hungary	-.09*	.03	-.02	.04	-.02	1000	.01
Ireland	.01	-.05	.04	.16*	-.06	1004	.02
Italy	.08*	-.01	.03	-.01	.01	1022	.00
Latvia	.06	.09*	.04	.04	-.05	1008	.01
Lithuania	-.02	.04	-.05	-.02	-.09*	1021	.01
Luxembourg	.08	.05	-.03	.09	.00	501	.01
Malta	.02	.11*	.03	.02	-.07	500	.01
The Netherlands	.12*	.05	-.09*	.09*	-.00	1041	.03
Poland	-.02	.11*	.02	-.02	-.00	1000	.01
Portugal	.03	.01	-.09*	-.04	-.00	1001	.00
Romania	.05	-.04	.03	.01	-.02	1019	.00
Slovakia	.07*	.04	-.07*	.08*	.01	1085	.01
Slovenia	.03	-.01	.00	.07	.02	1003	.00
Spain	.02	.06	-.08*	.02	-.04	1033	.01
Sweden	.10*	-.03	-.08*	.15*	.13*	1007	.06
United Kingdom	.10*	.04	-.04	.08*	.04	1306	.02

Notes: Entries are standardized coefficients. The post-stratification weight factor is used for the individual country samples.

* $p<.05$

Appendix B: Multi-Level Modeling with Random Intercepts

We use a hierarchical linear or multi-level regression model to estimate individual- and national-level effects simultaneously (Raudenbush and Bryk 2002; Snijders and Bosker 2011). The data are organized hierarchically, with individuals (level one) nested in nations (level two). We use individual and national level data from 25 EU nations. Individual-level data are from the Eurobarometer 69.2 survey fielded in 2008. From this dataset, we include five individual-level predictors: political ideology, gender, age, full-time education, and perceived understanding. We include four national-level predictors gathered from the World Bank (http://data.worldbank.org/indicator). Three measures are from 2007, while the *pump price for gasoline* is from 2008 given inavailability of data for 2007; this one-year lagged value is typical in cross-national research. These four measures include the natural log of *GDP per capita* (current US$), the natural log of *CO2 emissions per capita* (metric tons), the natural log of the *percentage of total energy consumption from fossil fuels*, and the *pump price for gasoline* (US$ per liter). *Former communist country* is a dummy variable (former communist country=1).

We include the five individual characteristics described in the main text in the level-one component of the MLM and the five national characteristics described above in the level-two component. Preliminary analyses (not shown) reveal that the within-country differences are larger than the between-country differences. We estimate random intercept models where national-level variables affect the random intercept terms for each of the five outcome measures of ACC views. These random intercept models highlight country variation in citizens'views of climate change and introduce country characteristics to explain why differences may be present across nations, net of effects of individual-level variables.

The level one equation for the multi-level model for climate change views is:

$$Y_{ij}=\beta_{0j}+ \beta_{1j} \text{POLITICAL IDEOLOGY} + \beta_{2j} \text{GENDER}+ \beta_{3j} \text{AGE} + \beta_{4j} \text{EDUCATION} + \beta_{5j} \text{UNDERSTANDING} + r_{ij}$$

where Y_{ij} is the value on the *acceptance of anthropogenic climate change index* for person *i* in country *j*. Random coefficient models, completed as preliminary analyses (not shown but described below), indicate which individual-level variables vary across countries for each of the five measures of ACC views, thus serving as an important step in model building in multi-level analyses (Raudenbush and Bryk 2002). For the *acceptance of anthropogenic climate change index*, all five level-one individual variables vary across countries and are therefore estimated as random (i.e., allowed to vary across countries); for *perceived seriousness of climate change*, ideology, gender, and understanding are allowed to vary randomly, while age and education are fixed; for the *beliefs about fighting climate change index*, all five variables are allowed to vary; for *personal willingness to pay to fight climate change*, three level-one variables are estimated as random (gender and ideology are fixed); and for the *support for EU greenhouse gas emission reduction policies index*, four of the five variables are modeled as random, while perceived understanding is treated as fixed. Specifications of the country-level models for the random intercept models (shown here for the *acceptance of anthropogenic climate change index*) are:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \text{FORMER COMMUNIST} + \gamma_{02} \text{GDP} + \gamma_{03} \text{CO2 EMISSIONS} + \gamma_{04} \text{ENERGY} + \gamma_{05} \text{GAS PRICE} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + u_{2j}$$
.

.
.
$\beta_{6j} = \gamma_{60} + u_{6j}$

Where i=1,2,3,…N_{ij} (N_{ij}=25,150) and j=1,2,3,….J (J=25).

Individual-level independent variables ideology, education, age, and understanding are grand mean centered, which is recommended to hold constant compositional differences in individual characteristics (Raudenbush and Bryk 2002).

Appendix Table A1 includes coefficients and standard errors from MLMs for all five ACC views. These models answer the question of why some countries have higher mean levels of ACC views than others, taking into account country-level factors affecting each of the intercepts. Results show minimal effects for national-level factors in explaining differing mean levels of ACC views for four of the five measures. CO2 emissions are negatively related to the *beliefs about fighting climate change index* and the *support for EU greenhouse gas emissions reduction policies index*. The pump price for gasoline is positively related to the *acceptance of anthropogenic climate change index* and negatively related to *perceived seriousness of climate change.* The model for *personal willingness to pay to fight climate change* has three significant country-level effects. Status as a former communist country, GDP per capita, and pump price for gasoline are each positively related to *personal willingness to pay to fight climate change*. Introduction of these national-level factors does not account for variability in countries' mean levels of either the *acceptance of anthropogenic climate change index* or *perceived seriousness of climate change*. Country characteristics do account for 6.5%, 10%, and 32.5% of variability in countries' mean levels of the *support for EU greenhouse gas emission reduction policies index*, the *beliefs about fighting climate change index*, and *personal willingness to pay to fight climate change*, respectively.

References

Raudenbush S, Bryk A (2002) *Hierarchical linear models: applications and data analysis methods* (Sage, Thousand Oaks, CA).

Snijders T, Bosker R (2011) *Multilevel analysis: an introduction to basic and advanced multilevel modeling* (Sage, Thousand Oaks, CA).

Table B1: Multi-Level Models Predicting Climate Change Views in 25 EU Countries

	Acceptance of Anthropogenic Climate Change Index	**Perceived Seriousness of Climate Change**	**Beliefs about Fighting Climate Change Index**	**Personal Willingness to Pay to Fight Climate Change**	**Support for EU Greenhouse Gas Emissions Reduction Policies Index**
Individual-Level Predictors					
Intercept	2.777***	7.742***	2.701***	1.177***	2.015***
	(0.047)	(0.156)	(0.019)	(0.109)	(0.024)
Political ideology	0.015**	0.042*	0.009**	0.016	0.014***
	(0.005)	(0.016)	(0.003)	(0.011)	(0.004)
Gender	0.065***	0.269***	0.033***	-0.017	0.029**
	(0.012)	(0.041)	(0.007)	(0.020)	(0.009)
Age	-0.002***	-0.001	-0.000	-0.009***	-0.008**
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
Full-time education	0.021***	0.014	0.007***	0.076***	0.006**
	(0.003)	(0.010)	(0.002)	(0.007)	(0.002)
Perceived understanding	0.129**	0.392***	-0.037***	0.334***	0.006
	(0.014)	(0.037)	(0.007)	(0.025)	(0.007)
Nation-Level Predictors					
Former Communist country	0.083	-0.124	0.027	0.436*	-0.077
	(0.065)	(0.289)	(0.033)	(0.179)	(0.045)
GDP per capita (LN)	0.055	-0.053	0.024	0.467*	0.063
	(0.060)	(0.182)	(0.025)	(0.167)	(0.032)
CO_2 emissions per capita (LN)	-0.043	0.303	-0.084**	-0.265	-0.157***
	(0.075)	(0.192)	(0.029)	(0.156)	(0.040)
% of energy consumption from fossil fuels (LN)	-0.000	-0.00008**	0.000	0.000	0.000
	(0.000)	(0.00004)	(0.000)	(0.000)	(0.000)
Pump price for gasoline	0.312**	-1.099*	0.011	0.429*	0.004
	(0.107)	(0.452)	(0.057)	(0.250)	(0.086)
Variance Components					
Individual-level variance	.380	3.859	.118	1.959	.254
Country-level variance	.023	.295	.005	.080	.012
Bayesian information criterion	47,389.645	105,607.331	17,896.256	65,588.417	37,183.174
N_i (individuals)	25,150	25,150	25,150	18,613	25,150
N_j (nations)	25	25	25	25	25

Notes: Entries are coefficients. Standard errors in parentheses. * p<.05 ** p<.01 *** p<.001