Environmental and Pro-Social Norms: Evidence on Littering

Benno Torgler[*] Bruno S. Frey[†]

Clevo Wilson[‡]

[*]Queensland University of Technology, CREMA and CESifo, benno.torgler@qut.edu.au

[†]University of Zurich, CREMA and CESifo, bsfrey@iew.unizh.ch

[‡]Queensland University of Technology, clevo.wilson@qut.edu.au

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Abstract

The paper investigates the relationship between pro-social norms and its implications for improved environmental outcomes. This is an area, which has been neglected in the environmental economics literature. We provide empirical evidence to demonstrate a small but significant positive impact between perceived environmental cooperation (reduced public littering) and increased voluntary environmental morale. For this purpose we use European Values Survey (EVS) data for 30 European countries. We also demonstrate that Western European countries are more sensitive to perceived environmental cooperation than the public in Eastern Europe. Interestingly, the results also demonstrate that environmental morale is strongly correlated with several socio-economic and environmental variables. Several robustness tests are conducted to check the validity of the results.

KEYWORDS: littering, environmental morale, conditional cooperation, perceptions, pro-social behavior

1. Introduction

Does someone who believes that littering is rare in a public place exhibit higher environmental morale and act in a more environmentally conscious way? And does somebody who thinks that littering is common reduce his or her environmental morale and behavior?

Using recent data from 30 Western and Eastern European countries, this paper provides empirical support for the hypothesis that the environmental behavior of individuals is systematically influenced by the perception of others' behavior: people act in a conditionally cooperative way, in particular with respect to littering. The effect is statistically significant but overall relatively small. However, once we focus on Western European countries the effect strongly increases (twice as large). We also show that individuals in Western Europe have a high environmental morale, while it is low in Eastern European countries. The evidence provided has several policy implications. In particular, the existence of a positive relationship between the perceived environmental behavior of other people and one's own behavior can be used to bring about beneficial environmental outcomes in areas where law enforcement and market incentives fail. The attractive and cost-effective feature of the behavioral change induced by policy interventions is its voluntary nature.

An increasing number of economists have been involved in evaluating whether an individual's environmental morale and environmental motivation could help to reduce environmental degradation, or the problems of free riding associated with public goods (see Frey and Stutzer, 2008). An alternative policy sets out to 'force' people to comply by punishing offenders. This is in line with deterrence policy based on the economics-of-crime approach. Individuals are taken to maximize expected utility, taking into account the probability of detection and the degree of punishment. However, empirical and experimental findings indicate that deterrence models predict too little compliance. Moreover, the level of compliance observed cannot be explained by the amount of risk aversion involved. People are more compliant than deterrence models predict (see, for taxation, Feld and Frey, 2002, 2007; Torgler and Frey, 2007).

The literature suggests that social norms help us to explain a high degree of compliance (Andreoni, Erard and Feinstein, 1998; Torgler, 2007). In many situations, individuals do not act according to self-interest, but rather pro-socially (Meier, 2007; Frey and Meier, 2004b). Several laboratory experiments point out that behavior in public good games is driven by conditional cooperation: subjects cooperate when others cooperate and defect when other defect (for an overview, see Gächter, 2007). To our knowledge, no study investigates whether conditional cooperation is relevant in the natural environment. It thus remains uncertain whether results gained in experiments are directly transferable to contexts outside

of the lab. As far as we know, this is the first study demonstrating the relationship between perceived environmental cooperation of others and an individual's environmental morale in the field.

The paper is set out as follows. Section 2 provides a brief overview of the existing literature on social comparisons, and Section 3 presents the theoretical approach and develops our hypotheses. Section 4 presents the empirical results. In Section 5, we discuss the potential causality problems, and Section 6 concludes with a summary and discussion of the main results.

2. Overview of the literature

Many traditional models have treated public cooperation as an isolated case. However, subjects do not normally act as isolated individuals playing a game against nature. This paper emphasizes the relevance of social context in understanding the willingness of individuals to keep the environment clean. The behavior of other citizens is important to understand why people comply. Hence, theories of pro-social behavior, which take the impact of behavior or the preferences of others into account, are promising. The concept of pro-social behavior is widely practiced in daily life. For example, Vesterlund (2003) reports that charitable organizations have an incentive to ask donors who make large contributions to permit the use of their name when a donation is made. Such an announcement is likely to have a positive effect on others who have not yet made a contribution. It also helps to reduce the problem of free riding and encourages individuals to make larger contributions.

Several theories have been put forward to explain what constitutes conditional cooperation. Most papers in the literature (cf. Rabin, 1998; Falk and Fehr, 2002) explain conditional cooperation in terms of reciprocity. In an environmental context, reciprocity means, for example, that if most individuals don't throw litter in a public place, other individuals would feel obliged to do likewise. As mentioned in the introduction, several laboratory experimental studies (e.g. public good experiments) provide evidence of the existence of pro-social behavior. For example, Fischbacher, Gächter and Fehr (2001) find that 50% of the subjects were conditionally cooperative. Falk, Fischbacher and Gächter (2003) create a laboratory situation in which each subject is a member of two economically identical groups, where only the group members differ. The study observes that the same subjects contribute different amounts, depending on the behavior of others in the group. The study finds that contributions are larger when group cooperation is higher.

As an alternative to reciprocity, the concept of conformity (cf. Henrich, 2004) has been used to explain conditional cooperation. Conformity refers to the motivation of individuals to fulfill social norms (e.g. keeping the environment

clean) and, therefore, could be interpreted in some ways as acting according to society's rules. Behaving according to social norms is a kind of by-product of individuals' psychological propensity to act the way others do in society. Carpenter (2004) referring to psychologists defines conformity, as 'the tendency to copy the most prevalent behaviour in a population' which he states according to the psychology literature is 'particularly a strong and robust predictor of human behaviour'. This concept is less connected to incentives and benefits than is reciprocity. In this case, individuals would contribute, even if the good in question does not benefit anyone, as long as it is perceived that a sufficient number of individuals are contributing (Bardsley and Sausgruber, 2005). The work of Carpenter (2004) proves this point. Using an experiment he shows how conformity influences free riding.

While several early studies provide evidence of conditional cooperation within a laboratory setting, an increasing number of studies have been conducted to check the validity of such studies outside of a laboratory setting. Frey and Meier (2004a) provide field experimental evidence of conditional cooperation. They analyze students' decisions regarding contributions to two social funds administered by the University of Zurich. Their study shows that, when more individuals expect others to cooperate, they are more willing to cooperate. In another study, Frey and Meier (2004b) observe that the strongest reaction to information about the behavior of other individuals is observed in students who are uncertain whether or not to contribute to two social funds at their University. Heldt (2005) conducts a natural field experiment on conditional cooperation, in which cross-country skiers in two Swedish ski resorts are faced with the decision of whether or not to contribute to ski track funding. The results suggest that the percentage of subjects making a contribution is higher when they know that a high percentage of individuals are making a contribution. Shang and Croson (2008) conducted a field experiment at an anonymous public radio station during an on-air fundraising campaign to investigate the influence of social information on the size of an individual's contribution. The results indicate that social information does indeed influence contributions. Martin and Randal (2008) conducted a natural field experiment at an art gallery where admission was free, but a donation could be placed in a transparent box in the foyer. The results showed that visitors donate significantly more when there is already some money in the box.

The study of pro-social behavior resulting from perceived public cooperation is an area that has largely been ignored in the environmental economics and management literature, despite its potential to influence environmental outcomes. The connection between perceived environmental cooperation of other individuals and environmental morale has not been studied in the environmental economics and management literature. In contrast, studies

linking improved environmental behavior, or higher willingness to pay for environmental preservation with education, knowledge, environmental awareness and prior experience are well established in the environmental economics literature (cf. Tisdell and Wilson, 2001). The lack of studies on environmental conditional cooperation may be explained by the unavailability of quality survey data, although the concept itself may not be new to researchers in environmental economics and management. The European Value Survey provides quality survey data, covering the relevant questions that enable this study to be undertaken.

Pro-social behavior occurs voluntarily. Such behavior is not only linked with public goods but also with particular private goods. The crucial feature here is that an individual acts according to the way the majority of the public is acting, and not necessarily because he or she benefits directly from such action. Hence, any strategies to increase pro-social behavior have the potential to improve environmental and social outcomes in a cost effective manner.

In everyday life, many environmental outcomes can be improved through enhanced pro-social actions. In this paper, we demonstrate the relationship between an individual's perceptions of the public not throwing away litter in public places and an increase in the individual's willingness to protect the environment. Other areas where such behavior is useful are, for example, conserving energy and water, contributing to environmental conservation, reducing pollution, engaging in wildlife friendly gardening, becoming members of environmental organizations and volunteering. In fact, the number of environmental activities that can benefit from pro-social behavior is endless.

This study looks at the disposal of litter to examine whether individual behavior is influenced by the perception of how other people behave. Despite littering in public places being recognized as a major public health and safety hazard and diminishing the aesthetic appearance of public places (cf. Ackerman, 1997), few studies have focused on dealing with this issue. Keizer, Lindenberg and Steg (2008) explore the spreading of disorder in regards to littering. In three small field experiments they compare disorder and order conditions. The results indicate that the presence of graffiti more than doubled the number of people littering. Similarly, almost twice as much people littered when four unreturned shopping carts were standing around in disarray at a parking garage compared to a situation where the garage was clear. These results were confirmed when exploring also an offense against the national law (set off fireworks in the week before New Year's Eve). Thus, their results suggest that in case a certain norm-violation becomes more common, other norms deviances are also more frequently observable. Litter and unkempt lawns have also been linked with crime (cf. Brown et al., 2004). Existing studies examine the role that education can play in reducing public litter (cf. Taylor et al., 2007), and the instruments (e.g. taxes, fines, charges and market incentives) that can be used to minimize the problem of

public littering (cf. Fullerton and Wolverton, 2000; Ackerman, 1997; Dobbs, 1991). One study (Kinnaman and Fullerton, 1994), dealing with garbage recycling, examines why some households participate in curbside recycling programs, even in the absence of a user fee; why other households do not participate, even in the presence of a user fee; and why some households choose to litter while others do not. However, the Kinnaman and Fullerton (1994) paper deals with user fees and does not address the issue of conditional cooperation in littering behavior.

3. Empirical approach

3.1. Data set

Exploring the social norms as a dependent variable is not irrelevant. Prevailing social norms tend to generate increased individual cooperation in public good situations and, in some instances, in private goods as well (see, e.g., Gächter, 2007; Meier 2007). Violation of social norms can have negative consequences, such as internal sanctions (e.g. guilt, remorse) or external legal and social sanctions, such as gossip and ostracism. As Polinsky and Shavell (2000) point out, the corresponding literature focuses on the influence that social norms have on individual behavior, and their role as a substitute for, or a supplement to, formal laws. Laws themselves can influence social norms. Rege and Telle (2001) suggest that social norms may explain why many individuals don't litter public places. If littering is not acceptable in a society, a "person throwing his ice-cream-paper on the street will feel social disapproval from people observing him … many people do not litter even if they know that nobody is observing them, because littering imposes a feeling of guilt" (p. 3). Feelings of guilt or shame restrict behavior.

In contrast to experimental studies conducted on conditional cooperation, this paper uses data collected by the European Value Survey (EVS). This is a European-wide survey that is conducted to investigate social, economic, cultural and political changes. The survey also collects data on the basic values and beliefs of people throughout Europe. The first EVS survey was conducted between 1981 and 1983, the second between 1990 and 1991 and the third between 1999 and 2001, with an increasing number of countries participating over time. The methodological approach is explained in detail in the EVS (1999) source book, which provides information on response rates, the stages of sampling procedures, a translation of the questionnaire, and field work, along with measures of coding reliability, reliability of data, and data checks. All country surveys are conducted by experienced professional survey organizations, with the exception of Greece. Interviews are face-to-face and those interviewed are adult citizens aged 18 years

and older. Tilburg University coordinates the project and provides the guidelines to guarantee the use of standardized information in the surveys and to maintain the national representativeness of the data. To avoid framing biases, the questions are asked in a prescribed order. The response rates vary from country to country. However, the average response rate is around 60%.

Because the EVS asks an identical set of questions in various European countries, the survey provides a unique opportunity to examine the impact of conditional cooperation on environmental morale and preferences. This paper considers 30 representative national samples of at least 1,000 individuals in each country. The survey permits us to work with a representative set of individuals, covering a large set of countries. The data allow us to complement previous laboratory and field experiments with survey studies to demonstrate the existence of conditional cooperation in relation to environmental issues.

3.2. Dependent variable and conditional cooperation

From the EVS survey data, we have selected the willingness of individuals to keep public places free from litter as the dependent variable. The question in the survey was formulated thus:

> *In the following statement, please tell me whether you think it is never justified, always justified or somewhere in between: . . . to throw away litter in a public place.*

A ten-scale index is used for this question, with the two extreme scales being 'never justified' (value 1) and 'always justified' (value 10). This variable is identified as (a particular case of) environmental morale. The natural cut-off point is the value 1, where a high amount of respondents assert that throwing away litter in a public place is 'never justified' (68.3%). Previous studies on other justifiability variables using World Values Survey data find support for a similar cutoff point and apply a probit model in their empirical model (cf. Swamy et al., 2001). In line with this approach, our environmental morale (EM) variable takes the value 1 if the respondent says that throwing away litter in a public place is 'never justified', and zero otherwise. In addition, we compare the original scale with an ordered probit model and an OLS with standardized/beta coefficients to test the *relative* strength of a variable. We will also use an ordered probit after re-coding the ten-scale variable into a four-point scale (0, 1, 2, 3), with the value 3 assigned for "never justified". The scale numbering from 4-10 is assigned the value 0 due to lack of variance (2=2, 3=1). Such an approach is standard practice and has been used, for example, in the happiness and tax compliance literature (cf. Frey and Stutzer, 2002; Frey, 2008; Torgler, 2007). In general, it is important to go beyond the original probit model (1=never justified) since the answer to the question could be biased due to experimenter demand. It is obvious that the

"socially correct" answer would be "never justified". Such a situation arises if a large number of individuals, who think that it is justified to throw away litter in public places, state that littering is never justified. In other words, if the respondents want to give the "socially acceptable" answer they would say "1" and, if not, they would answer truthfully. In this latter case, an answer of "0" might be indicative of a much higher environmental morale than an answer of "1". Then, we would have the problem that respondents want to avoid looking bad in front of the interviewer (Bertrand and Mullainathan, 2001). It would also indicate that we would observe systematic biases rather than just random errors. We use several methods to deal with this problem. In the first instance, we try different cutoff points. We report, for example, a probit model, where we convert the values 1 and 2 to 1 (all other values = 0).[1] In addition, we also run a two-stage regression approach, where the original 0/1 model is treated as just the first stage. In the first stage, respondents decide whether or not to answer 1 ("socially correct response"). We are going to explore two cases: one in which respondents refer to littering, and one in which not only littering, but also other aspects are considered (tax evasion, bribing, claiming government benefits without being entitled to them, joyriding, lying). In the second stage, given the decision to answer something other than the socially correct response, individuals report a value from 2 to 10. In this case, the second stage regression would be used to explore the impact of conditional cooperation.[2] In addition, one can also examine the existence of cognitive problems (Bertrand and Mullainathan 2001). The experimental literature has shown that manipulations (e.g., order of the questions, exact wording or scales) can affect how people process and interpret questions. The problem arises because "respondents may make little mental effort in answering the question, such as by not attempting to recall all the relevant information or by not reading through the whole list of alternative responses" (Bertrand and Mullainathan, p. 68). To check this point, we explore the correlation between two similar questions asked in the EVS during different parts of the interview:

> *How interested would you say you are in politics?* (IP) *Very interested (value 1), somewhat interested (value 2), not very interested (value 3), not the least interested (value 4).*

> *How important is politics in your life?* (INP) *Very important (value 1), quite important (value 2), not very important (value 3), not the least important (value 4).*

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[1] The results remain robust when testing alternative cutoffs.

[2] It should be noted that, in all reported models, the original variable was recoded in such a manner that a higher value represents a lower justifiability of littering.

The correlation at the individual level is 0.614. Moreover, we also explore the correlation with the question:

> *When you get together with your friends, would you say you discuss political matters frequently (value 3), occasionally (value 2) or never (value 1)?* (DP).

The correlation between the INP and the DP is 0.451 and between the IP and the DP is 0.564. Thus, all the variables are highly correlated. Face-to-face interviews may also help to guarantee that subjects are aware of the whole list of alternative responses. The EVS has the advantage of being a wide-ranging survey covering a large number of different topics. The data for the environmental question used in this paper were only a part of the large EV survey. Hence, this further reduces the environmental *framing biases*.

The approaches discussed are relevant because empirical support for a theoretical foundation depends not only on the validity of the theory but also on the quality of the data. It is not possible to ascertain whether respondents are truthful in their answers with survey data, since truth is not observable by the interviewers (Kanazawa, 2005). To validate statements, one could explore the correlation between respondents' statements and observed behavior. However, this is only possible for specific questions (e.g., voting behavior). Using an attitudinal question, such as in our case, reduces the possibilities of conducting such a validation analysis. Nevertheless, we could explore the correlation between the EM and environmental performance/outcome at the macro (country) level. Therefore, we explore the relationship between our dependent variable and the Environmental Sustainability Index (ESI) developed by the Yale Center for Environmental Law and Policy and the Center for International Earth Science Information Network at Columbia University. The index measures the ability of nations to protect the environment over the next few decades, integrating 76 data sets tracking natural resource endowments, past and present pollution levels, environmental management efforts and the capacity of a society to improve its environmental performance covering 21 indicators of environmental sustainability (see the ESI 2005). Although the conditional cooperative question (PL) has not been covered in the World Values Survey (WVS), the EM question has been asked in the WVS. We, therefore, use the WVS to explore the correlation between justifiability of littering and the ESI.[3] The results are reported in *Figure 1*. We take the country mean values of all the waves to generate our "justifiability of ittering" variable. In this case, we don't recode the variable. In other words, higher values are correlated with a higher level of the justifiability of littering. In the ESI index, higher values are correlated with a higher level of environmental sustainability. The index ranges from 0 to 100. The highest values can be found in Scandinavian countries, such as Finland, Norway or Sweden (with a score of

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[3] We used country average values over the available waves.

more than 70). *Figure 1* shows an expected negative correlation relationship (Pearson r=-0.373) that is statistically significant at the 0.01 level. Analyzing the linear relationship in a simple regression indicates that the 'justifiability of littering' variable can explain approximately 15% of the total variance of the dependent variable (ESI). Such results indicate the usefulness of working with attitudinal questions, despite the potential survey biases.

Figure 1: Environmental sustainability and justifiability of littering
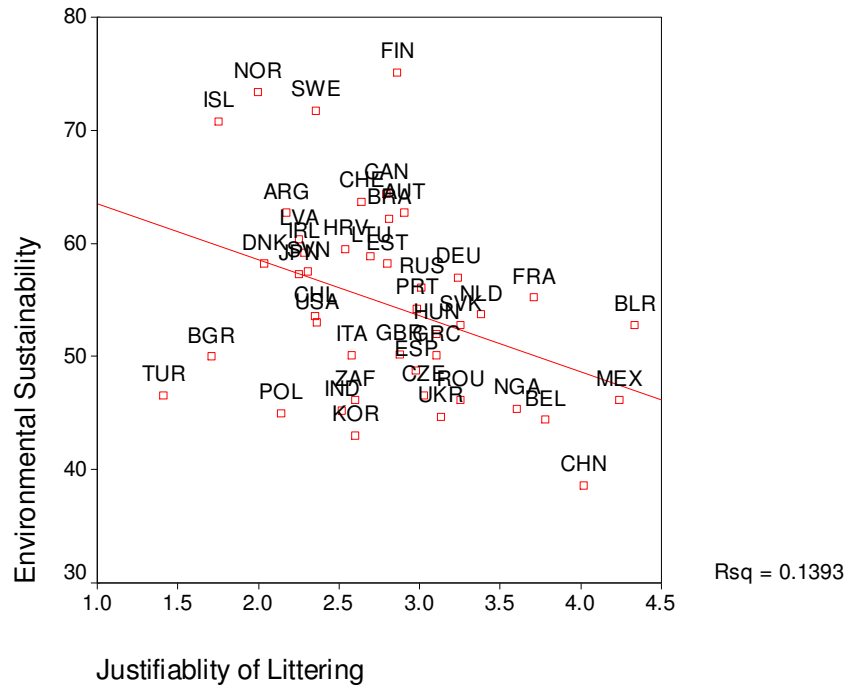
Due to discussed measurement-error problems Bertrand and Mullainathan (2001) advise against using survey answers as dependent variable. We have shown in this section how you can apply approaches that deal with such potential biases. Dealing with these issues can help to evaluate in a better manner whether or not it makes sense to use an attitudinal variable as a dependent one.

Next, we use the following question as an independent variable to investigate the impact of conditional cooperation (PL = perceived littering) on the EM.

> *According to you, how many of your compatriots do the following: Throw away litter in a public place? (4=almost all, 1=almost none)*

In general, we observe an increased interest among economists, especially behavioral and environmental economists, to use survey data. For example,

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research dealing with social capital, corruption, happiness and tax compliance explores the causes of attitudes, using other attitudinal variables as independent factors (cf. Diener and Suh, 2000; Brewer and Steenbergen, 2002; Uslaner, 2004; Brewer et al., 2004; Chang and Chu, 2006; and Torgler, 2007). In this paper, we investigate the correlation between perceived compliance and environmental morale in a multivariate analysis, controlling for other factors in order to better isolate the relationship. A specification based on multivariate analysis has the obvious advantage of presenting a more balanced view of the role of conditional cooperation by separating the effects of other exogenous variables. However, if conditional cooperation differs systematically in some other way, that also affects the willingness to cooperate, the results could be misleading.

4. Econometric results

Our multivariate analysis includes a vector of control variables. Previous research in environmental economics and social norms demonstrates the importance of considering socio-demographic and socio-economic variables along with variables, such as the level of church attendance, formal and informal education and participation in an environmental organization (cf. Torgler and Garcia-Valiñas, 2007; Torgler, 2007). In addition, we use a further variable to identify a potential conditional cooperation behavior effect, namely the individual concern for society. [4] The question measures how individuals experience their surrounding environment. We differentiate between two different regions of Europe (i.e. Western and Eastern Europe) to see whether there are any discernable differences between the two regions.[5] The rapid collapse of institutional structures in Eastern European countries during the 1990s produced a vacuum in many, if not all, of these countries. This led to large social costs, especially in terms of worsening income inequalities, increasing poverty, and poor institutional conditions resulting from uncertainty and high transaction costs. Torgler (2003) and Alm et al. (2006) show that such circumstances have had an impact on social norms. In addition, we are also using country fixed effects in several questions to control for country specific conditions. The descriptive statistics of variables used is shown in Table A2.

    Table 1 and 2 present the first results of the multivariate analysis. In these initial estimates, we exclude income. This is because the ten-point income scale in the EVS is based on national currencies, which reduces the possibility of

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[4] To what extent do you feel concerned about the living conditions of: your immediate family, people in your neighborhood, people in your region, fellow countrymen, Europeans, human beings in general, elderly people, unemployed people, immigrants, the sick and disabled? (5=very much, 1=not at all. Index=sum of all 10 questions).

[5] Table A1 in the appendix lists the Western and Eastern European countries.

comparing nations in a cross-country comparison.[6] The self-classification of the respondents' economic situation into various economic classes may be used as a proxy. However, data for this purpose has not been collected in all countries. Thus, we include economic status sequentially in the specification. This is shown in *Table 6*.

In *Table 1*, we use several models to check the robustness of results. In EQ1, we use a weighted probit model with the cutoff point 1 (1=littering is never justified, 0=everything else). To deal with the "social desirability" problem, we change the cutoff point in EQ2. The values 1 and 2 in the original scale have been coded as 1, and all other values coded as 0. The process and justification were discussed in the previous section. In Table 2 we show the results of the weighted ordered probits. EQ3, shows a weighted ordered probit, using the 10 point scale and recoding the scale in such a manner that it represents environmental morale (EM, 10=littering is never justified). In EQ4, we report the four-point weighted ordered probit model, and in EQ5, an OLS with *beta* or *standardized* regression coefficients is presented to indicate the relative importance of conditional cooperation compared to the other variables used. To measure quantitative effects in the (ordered) probit case, we calculate the marginal effects. Marginal effects indicate the change in the probability of individual having a specific level of environmental morale when the independent variable increases by one unit. For simplicity, the marginal effects in all the estimations are presented for the highest value only. Weighted estimates are conducted to make the samples correspond to the national distribution.[7] Furthermore, answers such as 'don't know' and missing values are eliminated in all estimations. This is standard procedure for work of this nature.

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[6] Income is coded on a scale from 1 to 10, and these income intervals are not fully comparable across countries.

[7] The weighting variable is provided by the EVS.

Table 1: Environmental and conditional cooperation – weighted probit result

DEP. V.: *ENVIRON. MORALE (EM)*	*Coeff.*	*z-Stat.*	*Marg. Effects*	*Coeff.*	*z-Stat.*	*Marg. Effects*
	WEIGHTED PROBIT (1)			*WEIGHTED PROBIT*[a] (2)		
PERCEIVED ENVIR. COOPERATION (PL)	-0.065***	-6.19	-0.023	-0.097***	-8.35	-0.028
CONCERN FOR SOCIETY	0.010***	9.04	0.003	0.009***	7.64	0.002
Voluntary Organization						
Environ. Organization	0.114***	3.16	0.04	0.142***	3.56	0.038
Demographic Factors						
AGE 30-39	0.099***	3.59	0.035	0.120***	4.10	0.033
AGE 40-49	0.159***	5.41	0.056	0.134***	4.25	0.037
AGE 50-59	0.219***	6.8	0.075	0.185***	5.34	0.050
AGE 60-69	0.269***	6.74	0.091	0.252***	5.82	0.066
AGE 70+	0.237***	5.01	0.08	0.214***	4.11	0.056
FEMALE	0.089***	5.03	0.032	0.102***	5.28	0.029
Formal and Informal Educ.						
EDUCATION	-0.001	-0.67	0	0.000	-0.06	0.000
POLITICAL DISCUSSION	-0.036***	-2.84	-0.013	-0.013	-0.95	-0.004
Marital Status						
WIDOWED	-0.037	-1.09	-0.013	-0.012	-0.32	-0.003
DIVORCED	-0.083***	-2.65	-0.03	-0.075**	-2.18	-0.022
SEPARATED	-0.102	-1.64	-0.037	-0.114	-1.75	-0.034
NEVER MARRIED	-0.113***	-4.55	-0.041	-0.125***	-4.74	-0.036
Employment Status						
PART TIME EMPLOYEE	-0.128***	-3.95	-0.047	-0.065*	-1.85	-0.019
SELF-EMPLOYED	0.048	1.36	0.017	0.078**	2.01	0.021
RETIRED	0.106***	3.18	0.037	0.114***	3.06	0.032
AT HOME	0.176***	5.34	0.06	0.139***	3.88	0.038
STUDENT	-0.158***	-3.89	-0.058	-0.122***	-2.84	-0.036
UNEMPLOYED	0.01	0.33	0.004	-0.027	-0.80	-0.008
OTHER	0.091	1.44	0.032	0.117*	1.75	0.032
Religiosity						
CHURCH ATTENDANCE	0.010***	3.01	0.004	0.013***	3.70	0.004
REGIONS	YES			YES		
Pseudo R2	0.024			0.026		
Number of observations	32433			32433		
Prob > chi2 / Prob > F	0.000			0.000		

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE, EASTERN EUROPE. Significance levels are:
* $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$. [a] recoding probit, ten point scale dependent variable, [c] four point scale dependent variable

Table 2: Environmental and conditional cooperation – weighted ordered probit and weighted OLS

DEP. V.: *ENVIRON. MORALE (EM)*	*Coeff.*	*z-Stat.*	*Marg. Effects*	*Coeff.*	*z-Stat.*	*Marg. Effects*	*Beta*	*t-Stat.*
	WEIGHTED ORDERED PROBIT[b] (3)			*WEIGHTED ORDERED PROBIT[c]* (4)			*WEIGHTED OLS* (5)	
PERCEIVED ENVIR. COOPERATION (PL)	-0.082***	-8.00	-0.029	-0.081***	-7.92	-0.029	-0.057***	-9.38
CONCERN FOR SOCIETY	0.009***	8.91	0.003	0.009***	8.99	0.003	0.050***	8.58
Voluntary Organization								
Environ. Organization	0.120***	3.60	0.042	0.130***	3.87	0.045	0.015***	2.84
Demographic Factors								
AGE 30-39	0.104***	4.16	0.037	0.105***	4.08	0.037	0.041***	4.73
AGE 40-49	0.142***	5.21	0.050	0.143***	5.12	0.050	0.049***	5.58
AGE 50-59	0.205***	6.89	0.071	0.206***	6.79	0.071	0.064***	7.66
AGE 60-69	0.256***	6.87	0.087	0.259***	6.86	0.088	0.066***	7.24
AGE 70+	0.227***	5.06	0.077	0.228***	5.03	0.077	0.058***	6.63
FEMALE	0.092***	5.59	0.033	0.095***	5.65	0.034	0.038***	6.17
Formal and Informal Educ.								
EDUCATION	0.001	0.42	0.0002	-0.0002	-0.10	-0.0001	0.011*	1.92
POLITICAL DISCUSSION	-0.023*	-1.91	-0.008	-0.024*	-1.92	-0.009	-0.003	-0.48
Marital Status								
WIDOWED	-0.018	-0.56	-0.006	-0.025	-0.76	-0.009	-0.006	-1.16
DIVORCED	-0.084***	-2.85	-0.031	-0.079***	-2.62	-0.029	-0.020***	-3.45
SEPARATED	-0.118**	-2.07	-0.043	-0.110*	-1.90	-0.040	-0.012**	-2.00
NEVER MARRIED	-0.115***	-5.06	-0.042	-0.117***	-5.06	-0.043	-0.044***	-5.56
Employment Status								
PART TIME EMPLOYEE	-0.090***	-3.11	-0.033	-0.095***	-3.18	-0.035	-0.010*	-1.70
SELF-EMPLOYED	0.062*	1.88	0.022	0.069**	2.06	0.024	0.013**	2.33
RETIRED	0.109***	3.43	0.039	0.112***	3.48	0.039	0.030***	3.57
AT HOME	0.161***	5.12	0.056	0.160***	5.02	0.055	0.025***	4.16
STUDENT	-0.124***	-3.40	-0.045	-0.124***	-3.31	-0.045	-0.013*	-1.77
UNEMPLOYED	-0.009	-0.31	-0.003	-0.012	-0.38	-0.004	-0.011*	-1.66
OTHER	0.117**	2.12	0.041	0.108*	1.89	0.038	0.010*	1.87
Religiosity								
CHURCH ATTENDANCE	0.010***	3.17	0.004	0.011***	3.47	0.004	0.023***	4.10
REGIONS	YES			YES			YES	
Pseudo R2	0.014			0.017			0.028	
Number of observations	32433			32433			32433	
Prob > chi2 / Prob > F	0.000			0.000			0.000	

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE, EASTERN EUROPE. Significance levels are: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01. [a] recoding probit,[b] ten point scale dependent variable, [c] four point scale dependent variable.

Consistent with our main hypothesis, the estimation results in *Tables 1* and 2 indicate that the lower the perceived environmental cooperation of other persons (higher values of the variable), the lower the environmental morale. In all the regressions, the coefficient for perceived environmental cooperation (PL) is statistically significant. The marginal effects indicate that, if the perceived lack of cooperation rises by one unit, the percentage of individuals reporting the highest environmental morale falls by more than 2 percentage points. A move of PL from the minimum to the maximum leads to increase in the share of people who think that littering is not okay of around 6 percentage points. Thus, we observe a relatively small but statistically significant effect. Interestingly, EQ5 (*Table 2*) indicates the relative importance of the PL. Larger beta values are observed only for some of the age variables.

Looking at the other variables in *Tables 1* and *2*, we observe that being active in an environmental organization has a positive effect, with marginal effects being around four (4) percentage points. Moreover, concern for others is also positively correlated with environmental morale (EM). A positive correlation can also be found for church attendance.[8] In all cases, the coefficient is positively correlated with our dependent variable. This supports the argument that churches can act as social norm enforcers (cf. Torgler, 2006). We also observe a very strong age effect. This is consistent with the compliance and criminology literature (Hirschi and Gottfredson, 2000; Torgler, 2007), but not with several studies on environmental attitudes that report that age is negatively correlated with the willingness to contribute to additional environmental protection, since older people are unlikely to enjoy the long-term benefits of preserving resources (Whitehead, 1991; Carlsson and Johansson-Stenman, 2000). *Table 1* also reports gender differences, reporting a higher environmental morale among women. Zelezny et al. (2000) report that, regardless of age, women show more concern for the environment than men. In our analysis, we observe strong gender differences. On the one hand, the results show a robust relationship between information or formal education and EM. [9,10] With reference to educational issues, the literature shows that formal education has a

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[8] Apart from weddings, funerals and christenings, how often do you attend religious services? More than once a week, once a week, once a month, only on special holy days, once a year, less often, practically never or never (8=more than once a week to 1=practically never or never).

[9] Formal education is usually expressed as the extent of education or degrees a person has obtained. It can alternatively be expressed as the number of years spent in education (Blomquist and Whitehead, 1998).

[10] Formal education: At what age did you complete or will you complete your full time education, either at school or at an institution of higher education? Please exclude apprenticeships. Informal education/political discussion: When you get together with friends, would you say you discuss political matters frequently, occasionally or never (3=frequently, 2=occasionally, 1=never)?

significant positive influence on environmental willingness to contribute (Blomquist and Whitehead, 1998; Engel and Pötschke, 1998; Witzke and Urfei, 2001; Veisten et al., 2004). On the other hand, informal education is also important (Whitehead, 1991; Blomquist and Whitehead, 1998; Carlsson and Johansson-Stenman, 2000; Hidano et al., 2005). The literature argues that well-informed citizens are more aware of environmental issues and problems and have stronger environmental attitudes, because they are more knowledgeable about the possible damage (Danielson et al., 1995; Torgler and Garcia-Valiñas, 2007). However, one should note that the literature on compliance does show a clear relationship with regard to education (Torgler, 2007). Finally, marital status might influence environmental attitudes as well. It can be argued that married people are more compliant or more concerned about environmental degradation than others, especially compared to single people. They are more constrained by their social network and are often very involved with the community (Tittle, 1980). This argument also holds true when focusing on moral attitudes or, in our case, environmental morale. Overall, the estimates indicate a tendency for married people to have relatively high environmental preferences and high levels of environmental morale, although the differences are not always statistically significant.

In *Figures 2* and *3* and *Tables 3 and 4,* we explore whether the conditional cooperation effect holds for both regions, namely Western and Eastern Europe. First, we explore the conditional cooperation effect at the country level. For this purpose, we build average values for each country, using the 10 point scale (10=never justified) available for the environmental morale variable. *Figure 2* shows a relatively strong negative correlation (Pearson r=-0.460), significant at the 0.05 level. The simple linear regression shows that the PL variable can explain more than 20% of the total variance of the EM variable in Western Europe. On the other hand, the correlation between PL and EM is not statistically significant for Eastern Europe (see *Figure 3*).

**Figure 2: Perceived environmental cooperation and
environmental morale in Western Europe**

Perceived Environmental Cooperation (PL)
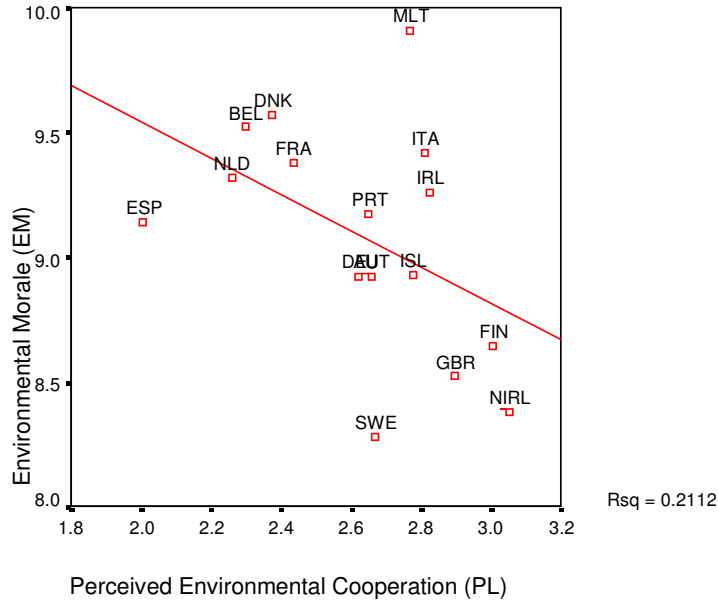
**Figure 3: Perceived environmental cooperation and
environmental morale in Eastern Europe**

Perceived Environmental Cooperation (PL)

16
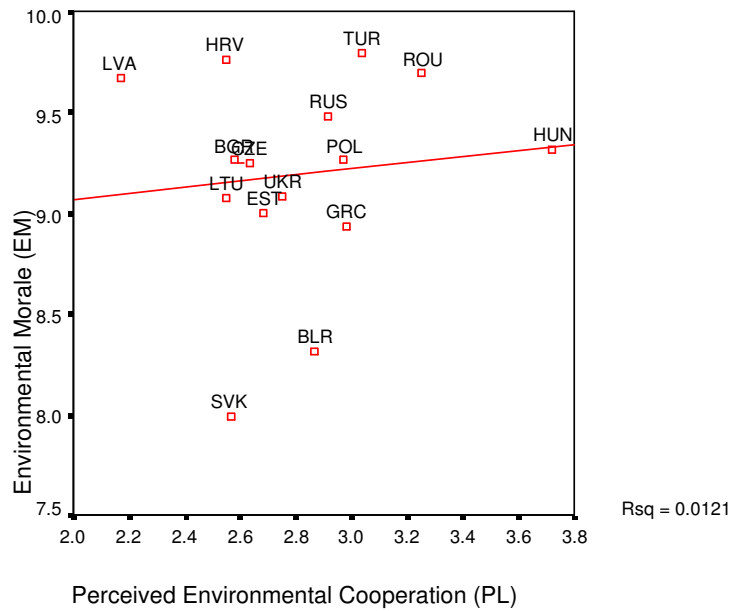
Table 3: Regional differences – Western Europe

| DEP. VARIABLE: | WESTERN EUROPE | | | | |
	Coeff.	z-Stat.	Marg. Effects	Beta	t-Stat.
	WEIGHTED PROBIT			WEIGHTED OLS	
ENVIRONMENTAL MORALE (EM)		(6)			(7)
PERCEIVED ENVIRON. COOPERATION (PL)	-0.174***	-10.51	-0.050	-0.102***	-12.01
CONCERN FORSOCIETY	0.014***	8.47	0.004	0.081***	10.15
Voluntary Organization					
Environ. Organization	0.220***	4.72	0.059	0.023***	3.27
Demographic Factors					
AGE 30-39	0.143***	3.47	0.040	0.045***	3.80
AGE 40-49	0.163***	3.58	0.045	0.055***	4.53
AGE 50-59	0.161***	3.33	0.044	0.063***	5.29
AGE 60-69	0.275***	4.66	0.073	0.072***	5.71
AGE 70+	0.266***	3.68	0.070	0.066***	5.25
FEMALE	0.116***	4.21	0.033	0.039***	4.46
Formal and Informal Educ.					
EDUCATION	-0.007***	-2.70	-0.002	-0.012	-1.51
POLITICAL DISCUSSION	-0.028	-1.42	-0.008	-0.015*	-1.88
Marital Status					
WIDOWED	-0.017	-0.31	-0.005	-0.004	-0.50
DIVORCED	-0.047	-0.94	-0.014	-0.016*	-1.97
SEPARATED	-0.123	-1.53	-0.037	-0.012	-1.49
NEVER MARRIED	-0.031	-0.88	-0.009	-0.016	-1.53
Employment Status					
PART TIME EMPLOYEE	-0.056	-1.16	-0.016	-0.005	-0.61
SELF-EMPLOYED	0.082	1.64	0.023	0.013*	1.74
RETIRED	0.131**	2.57	0.036	0.030**	2.53
AT HOME	0.029	0.63	0.008	0.001	0.13
STUDENT	-0.079	-1.32	-0.024	-0.009	-0.90
UNEMPLOYED	-0.040	-0.77	-0.012	-0.016*	-1.80
OTHER	0.082	0.92	0.023	0.009	1.28
Religiosity					
CHURCH ATTENDANCE	0.026***	5.24	0.008	0.048***	6.18
Pseudo R2	0.036			0.041	
Number of observations	17415			17415	
Prob > chi2 / Prob > F	0.000			0.000	

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE. Significance levels are: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01. Probit = recoded version (see EQ2, Table 1), OLS = ten point scale dependent variable.

Table 4: Regional differences – Eastern Europe

	EASTERN EUROPE				
	Coeff.	z-Stat.	Marg. Effects	Beta	t-Stat.
DEP. VARIABLE:	WEIGHTED PROBIT			WEIGHTED OLS	
ENVIRONMENTAL MORALE (EM)	(8)			(9)	
PERCEIVED ENVIRON. COOPERATION (PL)	-0.015	-0.88	-0.004	-0.008	-0.93
CONCERN FORSOCIETY	0.003**	2.10	0.001	0.016*	1.92
Voluntary Organization					
Environ. Organization	-0.008	-0.10	-0.002	0.007	0.98
Demographic Factors					
AGE 30-39	0.101**	2.36	0.027	0.036***	2.92
AGE 40-49	0.115**	2.55	0.031	0.043***	3.34
AGE 50-59	0.245***	4.70	0.063	0.068***	5.78
AGE 60-69	0.255***	3.81	0.065	0.062***	4.66
AGE 70+	0.163*	2.08	0.042	0.048***	3.87
FEMALE	0.103***	3.75	0.029	0.044***	4.87
Formal and Informal Educ.					
EDUCATION	0.010***	3.73	0.003	0.042***	5.81
POLITICAL DISCUSSION	0.005	0.25	0.001	0.012	1.43
Marital Status					
WIDOWED	0.015	0.28	0.004	-0.005	-0.64
DIVORCED	-0.086*	-1.77	-0.025	-0.021**	-2.47
SEPARATED	-0.045	-0.40	-0.013	-0.007	-0.85
NEVER MARRIED	-0.227***	-5.55	-0.066	-0.073***	-5.78
Employment Status					
PART TIME EMPLOYEE	-0.087	-1.64	-0.025	-0.016*	-1.84
SELF-EMPLOYED	0.068	1.10	0.018	0.011	1.36
RETIRED	0.088	1.54	0.024	0.028**	2.25
AT HOME	0.314***	5.26	0.077	0.052***	6.62
STUDENT	-0.138**	-2.23	- 0.040	-0.013	-1.11
UNEMPLOYED	0.004	0.08	0.001	-0.002	-0.19
OTHER	0.169	1.63	0.043	0.011	1.37
Religiosity					
CHURCH ATTENDANCE	-0.0004	-0.08	-0.0001	-0.004	-0.45
Pseudo R2				0.027	
Number of observations				15018	
Prob > chi2 / Prob > F	0.000			0.000	

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE. Significance levels are: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$.
 Probit = recoded version (see EQ2, Table 1), OLS = ten point scale dependent variable.

It is interesting to note that a study in Australia has found that littering is more commonplace in regional and rural areas (see Beverage Industry Environment Council, 2001). One reason for this could be that, in areas with low incomes, littering is taken for granted and most individuals do not find littering to be a problem. Hence, such an attitude has very little or no impact on morale. A similar result is observable at the individual level (see *Tables 3* and *4)*. EQ6 and EQ7 in *Table 3* focus on Western Europe, and EQ8 and EQ9 on Eastern Europe (*Table 4*). Here, too, we observe a similar picture. The coefficient PL is statistically significant in Western Europe, but not in Eastern Europe. The marginal effects for the PL in Western Europe are comparable to age and the environmental organization variable. The OLS estimates even report the largest beta coefficients for the PL for Western Europe. Interestingly, we also observe other regional differences in *Tables 3* and *4*. Religiosity (in our case church attendance) only matters for Western Europe. This shows that environmental social norm enforcement through churches is not observable in Eastern Europe. One reason might be that that communist countries tried to eradicate organized religion in most East European countries over a long period of time, regarding it as "competitive with the Communist quasi-religion" (Barro and McCleary, 2002, p.13). Moreover, participation in an environmental organization is only important for Western Europe. This could partly be explained by the lack of environmental organizations in most East European countries, especially during the communist regime. On the other hand, formal education is positively correlated with the EM for Eastern Europe, but not for Western Europe. This result could be because, for individuals in Western countries, other forms of education and informal information matter more than formal education for the development of an EM.

In *Tables 5 and 6* we conduct several robustness tests using the same two models. Rather than using a dummy variable to differentiate between Western and Eastern Europe, we consider country fixed effects in all four reported regressions (EQ10-EQ13). In EQ12 and EQ13 (Table 6), we also add income proxies. Several studies show that the economic situation of an individual is an important aspect (Whitehead, 1991; Stevens et al., 1994; Blomquist and Whitehead, 1998; Popp, 2001; Witzke and Urfei, 2001; Bulte et al., 2005; Dupont, 2004; Veisten et al., 2004; Hidano et al., 2005). These studies show a positive relationship between income and a preference to contribute to environmental causes. On the one hand, our study points to a non-linear relationship, reporting the highest environmental morale for the middle class, but without being statistically significant in EQ13. On the other hand, the PL variable is statistically significant in all 4 cases. Compared to the previous tables, we observe that the marginal effects decrease, but the beta coefficients in EQ11

and EQ13 (*Tables 5* and *6*) show that the relative importance of the PL has not changed.

   We conduct further robustness tests to deal with a potential "social desirability" bias. This is shown in Tables A3 and A4. We run a two-stage approach regression (see EQ14 to 17 in Tables A3 and A4) where the previous estimations were just the first stage. Initially, respondents decide whether or not to answer that littering is never justified ("socially correct response"). In a second stage, if they decide to answer something other than the socially correct response, individuals report a value from 2 to 10 (EQ 14 and 15 in Table A3). Furthermore, we use an alternative restriction by focusing on several justifiability variables on compliance, namely: cheating on tax if you have the chance, claiming state benefits to which you are not entitled, taking and driving away a car belonging to someone else (joy riding), lying in your own interest, and accepting a bribe in the course of your duties (see EQ16 and 17 in Table A4). If people provide the "socially desirable" answer, we would predict a similar answer with regard to other variables that measure social norms. The data indicates that in 26% of the cases, individuals report that none of these actions are ever justified. In *Tables A3 and A4,* we report the findings with regional (EQ14 and 16) and country fixed effects (EQ15 and 17). Looking at *Tables A3 and A4,* we can also see that PL matters.

5. Causality

Causality remains an issue, because one's own attitudes may lead to the expectation that others behave in the same way. [11] However, results from 'strategy method' experiments conducted by Fischbacher et al. (2001) and Fischbacher and Gächter (2006) suggest that causality goes from *beliefs about others' cheating* to one's *own behavior* rather than vice versa. Nevertheless, we will 1) conduct Durbin-Wu-Hausman tests for endogeneity in IV estimation, 2) run several 2SLS estimations with three different instruments, and 3) try to filter out a PL bias by correcting for the possibility that individuals base their beliefs on how others behave or act.

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[11] The EVS has the disadvantage that it is not a panel survey. A survey that follows individuals over time would help us to study the dynamics of adjustment more deeply. The question referring to conditional cooperation was only asked in the last EVS of 1999 through 2001. Longitudinal data would help us to reduce problems caused by unobserved individual heterogeneity.

Table 5: Robustness tests

DEP. VARIABLE: ENVIRONMENTAL MORALE (EM)	Coeff.	z-Stat.	Marg. Effects	Beta	t-Stat.
	WEIGHTED PROBIT			WEIGHTED OLS	
	(10)			(11)	
PERCEIVED ENVIRON. COOPERATION (PL)	-0.102**	-7.86	-0.027	-0.059**	-8.30
CONCERN FORSOCIETY	0.016**	11.99	0.004	0.084**	12.64
Voluntary Organization					
Environ. Organization	0.119**	2.72	0.030	0.011*	1.93
Demographic Factors					
AGE 30-39	0.114**	3.72	0.029	0.031**	3.70
AGE 40-49	0.124***	3.75	0.032	0.035**	4.00
AGE 50-59	0.207**	5.74	0.051	0.055**	6.68
AGE 60-69	0.307**	6.77	0.073	0.068**	7.65
AGE 70+	0.304**	5.57	0.072	0.061**	6.85
FEMALE	0.147**	7.35	0.039	0.052**	7.87
Formal and Informal Educ.					
EDUCATION	0.004**	2.08	0.001	0.022**	3.70
POLITICAL DISCUSSION	0.014	0.93	0.004	0.008	1.28
Income					
UPPER CLASS					
MIDDLE CLASS					
Marital Status					
WIDOWED	-0.023	-0.58	-0.006	-0.003	-0.53
DIVORCED	-0.049	-1.35	-0.013	-0.011*	-1.80
SEPARATED	-0.134*	-1.96	-0.038	-0.013**	-2.20
NEVER MARRIED	-0.155**	-5.54	-0.043	-0.049**	-6.00
Employment Status					
PART TIME EMPLOYEE	-0.031	-0.87	-0.008	-0.007	-1.09
SELF-EMPLOYED	0.033	0.81	0.009	0.005	0.89
RETIRED	0.072*	1.86	0.019	0.016*	1.85
AT HOME	-0.014	-0.36	-0.004	-0.006	-0.90
STUDENT	-0.156**	-3.52	-0.044	-0.028**	-3.35
UNEMPLOYED	-0.032	-0.91	-0.009	-0.007	-1.09
OTHER	0.086	1.26	0.022	0.010*	1.90
Religiosity					
CHURCH ATTENDANCE	-0.002	-0.54	-0.001	-0.001	-0.21
COUNTRY FIXED EFFECTS	YES			YES	
Pseudo R2	0.098			0.109	
Number of observations	32433			32433	
Prob > chi2 / Prob > F	0.000			0.000	

Notes: The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE, LOWEST CLASS, EASTERN EUROPE. Significance levels are: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$. Probit = recoded version (see EQ2, Table 1), OLS = ten point scale dependent variable.

Table 6: Robustness tests

	Coeff.	z-Stat.	Marg. Effects	Beta	t-Stat.
DEP. VARIABLE: *ENVIRONMENTAL MORALE (EM)*	*WEIGHTED PROBIT*			*WEIGHTED OLS*	
	(12)			(13)	
PERCEIVED ENVIRON. COOPERATION (PL)	-0.112***	-6.05	-0.029	-0.062***	-6.15
CONCERN FORSOCIETY	0.015***	7.89	0.004	0.087***	9.36
Voluntary Organization					
Environ. Organization	0.087	1.41	0.022	0.005	0.57
Demographic Factors					
AGE 30-39	0.124***	2.85	0.031	0.032***	2.65
AGE 40-49	0.110**	2.30	0.028	0.033***	2.66
AGE 50-59	0.181***	3.55	0.045	0.055***	4.84
AGE 60-69	0.250***	3.95	0.060	0.066***	5.31
AGE 70+	0.185**	2.43	0.045	0.043***	3.42
FEMALE	0.108***	3.76	0.028	0.035***	3.78
Formal and Informal Educ.					
EDUCATION	0.000	0.05	0.000	0.013	1.36
POLITICAL DISCUSSION	-0.071*	-1.70	-0.019	-0.017*	-1.87
Income					
UPPER CLASS	-0.056*	-1.84	-0.015	-0.013	-1.42
MIDDLE CLASS	0.038*	1.77	0.010	0.014	1.62
Marital Status					
WIDOWED	-0.006	-0.11	-0.002	0.002	0.21
DIVORCED	-0.067	-1.24	-0.018	-0.015*	-1.70
SEPARATED	-0.347***	-3.58	-0.104	-0.024***	-2.67
NEVER MARRIED	-0.142***	-3.48	-0.038	-0.040***	-3.63
Employment Status					
PART TIME EMPLOYEE	0.023	0.41	0.006	0.006	0.63
SELF-EMPLOYED	0.058	1.00	0.015	0.005	0.61
RETIRED	0.122**	2.32	0.031	0.028**	2.41
AT HOME	0.006	0.11	0.002	-0.002	-0.26
STUDENT	-0.051	-0.75	-0.013	-0.022*	-1.85
UNEMPLOYED	-0.014	-0.27	-0.004	-0.009	-1.09
OTHER	0.056	0.62	0.014	0.007	0.96
Religiosity					
CHURCH ATTENDANCE	-0.003	-0.59	-0.001	0.002	0.24
COUNTRY FIXED EFFECTS	YES			YES	
Pseudo R2	0.112			0.127	
Number of observations	16987			16987	
Prob > chi2 / Prob > F	0.000			0.000	

Notes: The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE, LOWEST CLASS, EASTERN EUROPE. Significance levels are: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$. Probit = recoded version (see EQ2, Table 1), OLS = ten point scale dependent variable.

Tables 7 and 8 report the results of three two-stage least squares (2SLS) estimations, together with their first stage regressions. For instruments, equation 18 uses 'individual interest in friends', equation 19 uses 'index of perceived honesty' , and equation 20 uses 'trusting others'.[12,13, 14] We are going to add the second two instruments sequentially into the specification. A stronger preference and awareness for interactions besides one's own behavior may trigger conditional cooperation. As a proxy, we use the variable interest in friends. We observe a low correlation between this instrument and the residual (r=0.04), which indicates that such a variable affects PL, but not EM. Moreover, an overall perceived impression of the compliance with regard to more serious legal offenses (e.g., tax evasion), should also affect how people perceive the way others behave in other areas, such as littering (e.g., areas where deviations from law are less enforced and punished). We build an index of perceived honesty, and observe a high correlation with PL (r=0.5) and a low correlation with the equation's disturbance process (r=0.03), which supports the requirements of a good instrument. Moreover, having a higher trust in others or in society may enhance comparisons and individual interest to take the perception of others' behavior into account. Interestingly, we observe practically no correlation with the residual (r=0.0074). In *Tables 7 and 8,* we provide several tests that explore the relevance of our instruments. The results show that the instruments and the F-tests for instrument exclusion set in the first-stage regression are statistically significant. We then conduct the Anderson's likelihood-ratio test. A failure to reject the null hypothesis would call the identification status of the estimated equation into question (Baum, 2006). *Tables 7 and 8* show that we can reject the null hypothesis that our specified instruments are redundant. We also conduct a Durbin-WU-Hausman test for endogeneity in the three IV estimations. The null hypothesis in *Tables 7 and 8,* which indicate that the OLS is an appropriate estimation technique, cannot, in most cases, be rejected. In other words, the C test statistics suggest that we cannot reject exogeneity of our PL variable. Now, looking at our 2SLS results, we observe that the PL is statistically significant in all three estimations. This supports previous results.

Tables A5 and A6 use yet another approach to deal with a potential endogeneity problem. It filters out a possible bias in the conditional cooperative effort. A causality problem may arise because an individual's willingness to

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[12] Please say how important each of the following is in your life … friends and acquaintances (4=very important, 1=not the least important).

[13] Index covering the sum of the following questions: *According to you (on a scale from 1 to 4), how many of your compatriots: (1) Pay cash for services to avoid taxes? (2) Go over the speed limit in built-up areas?*

[14] Generally speaking, would you say that most people can be trusted or that you can't be too careful in your dealings with people? (1=most people can be trusted, 0=can't be too careful).

cooperate (low justifiability of littering) could lead to the expectation that others would also behave in the same way. Thus, individuals with a higher EM have a lower perception of others not cooperating or contributing (lower PL). To deal with this possibility, we first calculate the average EM for each country. In the second stage, we calculate the average PL cooperation in each country for individuals having the highest EM value.[15] Next, we construct the difference between the two average values. These values may measure a particular bias in PL due to the level of environmental morale (e.g., high EM). The obtained variable (bias) is then added to the individual values of the group with the highest EM. As a consequence, the PL values between the group with higher and lower EM are brought closer together, depending on the PL level in each country. *Tables A5 and A6* present the results for the filtered PL variable, using regional (EQ 21) and country (EQ 22) fixed effects. Furthermore, we observe that the previous results remain robust.

6. Conclusions

This paper investigates whether perceived environmental cooperation of the public is an important determinant of explaining an individual's environmental morale. We hypothesize that an individual's behavior is likely to be influenced by his or her perception of the behavior of other individuals. Our attention was focused on littering. If an individual believes that throwing away litter in a public place is common, then the environmental morale of the individual decreases. In contrast, if an individual believes others to be compliant, then the environmental morale increases. Using recent European Value Survey data for Western and Eastern European countries, we provided empirical support for this conditional cooperation hypothesis. The effect was statistically significant but overall that very large. The strongest effect was observable for Western European countries. To our knowledge, this is the first study of this nature demonstrating the positive relationship between perceived environmental cooperation of others and an individual's environmental morale. The results remain robust, using a large number of specifications and conducting several robustness tests. We also address issues relating to potential causality and data limitation issues.

Conditional cooperation in general suggests two (long run) equilibria. Zero cooperation occurs if a large number of people are littering and thus act in a non-cooperative way. On the other hand, nearly full cooperation could occur if a large number of people are not littering. Our results indicate that individuals in

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[15] Value 1, stressing that throwing away litter in a public place is never justifiable.

Table 7: Instrumental approach

DEP. V.: ENVIRONMENTAL MORALE (EM)	Coeff.	t-Stat.	Coeff.	t-Stat.	Coeff.	t-Stat.	Coeff.	t-Stat.
	WEIGHTED 2SLS		FIRST STAGE REGRESSION		WEIGHTED 2SLS		FIRST STAGE REGRESSION	
	(18)				(19)			
PERCEIVED ENVIRON. COOPERATION (PL)	-0.081**	-2.36			-0.083**	-2.42		
CONCERN FORSOCIETY	0.018***	12.19	0.0003	0.54	0.018***	12.01	0.0001	0.20
Voluntary Organization								
Environ. Organization	0.080*	1.84	0.030	1.51	0.078*	1.79	0.030	1.50
Demographic Factors								
AGE 30-39	0.121***	3.40	-0.052***	-3.51	0.122***	3.43	-0.050***	-3.38
AGE 40-49	0.144***	3.84	-0.064***	-4.14	0.150***	4.00	-0.061***	-3.93
AGE 50-59	0.238***	6.14	-0.038**	-2.28	0.242***	6.23	-0.035**	-2.11
AGE 60-69	0.344***	7.69	-0.046**	-2.29	0.350***	7.85	-0.046**	-2.26
AGE 70+	0.340***	6.36	-0.051**	-2.12	0.344***	6.45	-0.049**	-2.03
FEMALE	0.167***	7.56	0.064***	6.91	0.166***	7.47	0.062***	6.75
Formal and Informal Educ.								
EDUCATION	0.007***	3.49	0.000	-0.10	0.007***	3.41	0.000	-0.08
POLITICAL DISCUSSION	0.017	1.05	0.002	0.31	0.019	1.15	0.002	0.34
Marital Status								
WIDOWED	-0.025	-0.72	-0.011	-0.64	-0.022	-0.62	-0.010	-0.63
DIVORCED	-0.072*	-1.78	0.002	0.15	-0.069*	-1.72	0.002	0.10
SEPARATED	-0.180**	-2.19	0.041	1.26	-0.162**	-1.99	0.042	1.27
NEVER MARRIED	-0.190***	-5.96	0.023*	1.71	-0.185***	-5.80	0.022	1.62
Employment Status								
PART TIME EMPLOYEE	-0.019	-0.47	-0.013	-0.78	-0.020	-0.48	-0.013	-0.76
SELF-EMPLOYED	0.042	0.97	-0.016	-0.91	0.038	0.87	-0.013	-0.73
RETIRED	0.071**	1.98	0.015	0.92	0.069*	1.93	0.016	0.98
AT HOME	-0.030	-0.80	0.001	0.07	-0.025	-0.67	0.002	0.10
STUDENT	-0.210***	-3.35	0.082***	3.52	-0.213***	-3.39	0.081***	3.48
UNEMPLOYED	-0.050	-1.18	-0.002	-0.12	-0.046	-1.09	0.001	0.07
OTHER	0.106	1.64	0.013	0.41	0.104	1.60	0.015	0.46
Religiosity								
CHURCH ATTENDANCE	0.001	0.22	-0.006***	-2.95	0.001	0.18	-0.006***	-3.00
COUNTRY FIXED EFF.	YES		YES		YES		YES	
Instruments:								
Index perceived honesty			0.288***	69.62			0.288***	69.58
Interest in friends							0.010*	1.67
Trusting others								
Test of excluded instruments			4846***				2427***	
Identification/IV relevance test (Anderson LR statistics)	6238***				6226***			
Durbin-Wu-Hausman tests: C stat.	2.594				2.780*			
Centered R2	0.112				0.112			
Number of observations	29853				29733			
Prob > F	0.000				0.000			

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE. Significance levels are: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$.

Table 8: Instrumental approach

	Coeff.	t-Stat.	Coeff.	t-Stat.
DEP. V.: ENVIRONMENTAL MORALE (EM)	*WEIGHTED 2SLS*		*FIRST STAGE REGRESSION*	
		(20)		
PERCEIVED ENVIRON. COOPERATION (PL)	-0.074**	-2.13		
CONCERN FORSOCIETY	0.018***	11.91	0.0002	0.38
Voluntary Organization				
Environ. Organization	0.060	1.33	0.034*	1.67
Demographic Factors				
AGE 30-39	0.127***	3.51	-0.048***	-3.17
AGE 40-49	0.153***	4.03	-0.057***	-3.58
AGE 50-59	0.249***	6.35	-0.031*	-1.82
AGE 60-69	0.344***	7.61	-0.046**	-2.23
AGE 70+	0.354***	6.57	-0.047*	-1.94
FEMALE	0.166***	7.39	0.062***	6.62
Formal and Informal Educ.				
EDUCATION	0.007***	3.36	0.000	0.11
POLITICAL DISCUSSION	0.015	0.91	0.003	0.42
Marital Status				
WIDOWED	-0.018	-0.51	-0.009	-0.55
DIVORCED	-0.070*	-1.73	0.003	0.21
SEPARATED	-0.150*	-1.83	0.038	1.13
NEVER MARRIED	-0.182***	-5.62	0.022*	1.65
Employment Status				
PART TIME EMPLOYEE	-0.029	-0.69	-0.012	-0.68
SELF-EMPLOYED	0.038	0.87	-0.010	-0.53
RETIRED	0.065*	1.79	0.019	1.14
AT HOME	-0.029	-0.77	0.002	0.10
STUDENT	-0.225***	-3.46	0.078***	3.27
UNEMPLOYED	-0.048	-1.12	0.001	0.03
OTHER	0.119*	1.82	0.027	0.81
Religiosity				
CHURCH ATTENDANCE	0.001	0.19	-0.006***	-3.13
COUNTRY FIXED EFF.	YES		YES	
Instruments:				
Index perceived honesty			0.287***	67.69
Interest in friends			0.011*	1.72
Trusting others			-0.031***	-3.30
Test of excluded instruments			1548***	
Identification/IV relevance test (Anderson LR statistics)	5973***			
Durbin-Wu-Hausman tests:				
C stat. (exogeneity/orthogonality of suspect instruments	2.088			
Centered R2	0.112			
Number of observations	28770			
Prob > F	0.000			

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE. Significance levels are: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$.

Western countries have high environmental morale, while it is low in Eastern European countries. A critical mass of cooperative individuals is required to induce a positive dynamic process of conditional cooperation. On the other hand, a society, which has many non-compliant individuals, will exhibit weaker social norms. Policies should take into account such path-dependent processes within a society. The closer we are to the threshold or tipping point, the easier it is to influence the dynamic conditional cooperative processes. However, identifying such a tipping point is not without problems. One possibility is to change the underlying institutional conditions (see, Friedman et al. 2002). Institutional improvements can provide shocks to a new equilibrium (Bird et al. 2006) and increases the chance of moving beyond the threshold point to induce positive conditional cooperative dynamics.

Understanding what shapes environmental morale needs to be investigated further. A good understanding of the interactions between environmental morale and perceived environmental cooperation, and the factors strengthening these relationships, has the potential to bring about better environmental outcomes.

Appendix

Table A1: Countries

Western European Countries	Eastern European Countries
Germany	Belarus
Austria	Bulgaria
Belgium	Croatia
Denmark	Czech Republic
Finland	Estonia
France	Greece
Great Britain	Hungary
Iceland	Latvia
Ireland	Lithuania
Italy	Poland
Malta	Romania
Netherlands	Russia
North Ireland	Slovak Republic
Portugal	Ukraine
Spain	
Sweden	

Table A2: Descriptive statistics

VARIABLES	Obs	Mean	Std. Dev.	Min	Max
ENVIRONMENTAL MORALE (EM)	40674	0.683	0.465	0	1
PERCEIVED ENVIRONMENTAL COOPERATION (PL)	37437	0.710	0.777	1	4
INDEX CONCERN FOR SOCIETY	38540	34.864	7.727	11	55
ENVIRON. ORGANIZATION	41125	0.049	0.216	0	1
AGE 30-39	40963	0.197	0.398	0	1
AGE 40-49	40963	0.191	0.393	0	1
AGE 50-59	40963	0.150	0.357	0	1
AGE 60-69	40963	0.135	0.342	0	1
AGE 70+	40963	0.102	0.302	0	1
FEMALE	41114	0.540	0.498	0	1
EDUCATION	39840	18.712	5.125	5	74
POLITICAL DISCUSSION	40713	1.886	0.654	1	3
UPPER CLASS	21335	0.136	0.343	0	1
MIDDLE CLASS	21335	0.338	0.473	0	1
WIDOWED	39861	0.097	0.295	0	1
DIVORCED	39861	0.070	0.256	0	1
SEPARATED	39861	0.016	0.124	0	1
NEVER MARRIED	39861	0.228	0.420	0	1
PART TIME EMPLOYEE	40919	0.068	0.252	0	1
SELF-EMPLOYED	40919	0.052	0.222	0	1
UNEMPLOYED	40919	0.229	0.420	0	1
AT HOME	40919	0.095	0.293	0	1
STUDENT	40919	0.061	0.240	0	1
RETIRED	40919	0.073	0.261	0	1
OTHER	40919	0.018	0.131	0	1
CHURCH ATTENDANCE	40762	3.871	2.456	1	8
INSTRUMENTS					
INTEREST IN FRIENDS	40885	3.289	0.690	1	4
INDEX PERCEIVED HONESTY	34478	5.429	1.162	2	8
TRUSTING OTHERS	39505	0.296	0.457	0	1

Table A3: Two-stage approach reporting second stage regressions

Second Stage Regression	Coeff.	t-Stat.	Coeff.	t-Stat.
DEP. VARIABLE:	*WEIGHTED OLS*		*WEIGHTED OLS*	
ENVIRONMENTAL MORALE (EM)	(14)		(15)	
	First stage: Decision whether to give socially correct response (littering)			
PERCEIVED ENVIRON. COOPERATION (PL)	-0.120***	-10.35	-0.119	-10.19
CONCERN FOR SOCIETY	0.010***	8.75	0.010***	8.24
Voluntary Organization				
Environ. Organization	0.109***	2.67	0.097**	2.37
Demographic Factors				
AGE 30-39	0.162***	5.13	0.161***	5.04
AGE 40-49	0.199***	5.97	0.197***	5.84
AGE 50-59	0.284***	7.88	0.288***	7.93
AGE 60-69	0.308***	6.94	0.310***	6.93
AGE 70+	0.317***	6.23	0.325***	6.30
FEMALE	0.124***	6.33	0.114***	5.78
Formal and Informal Educ.				
EDUCATION	0.003*	1.80	0.003	1.49
POLITICAL DISCUSSION	-0.007	-0.48	-0.006	-0.42
Marital Status				
WIDOWED	-0.036	-1.00	-0.032	-0.88
DIVORCED	-0.127***	-3.57	-0.124***	-3.43
SEPARATED	-0.152**	-2.16	-0.172**	-2.42
NEVER MARRIED	-0.170***	-6.03	-0.164***	-5.77
Employment Status				
PART TIME EMPLOYEE	-0.064*	-1.75	-0.041	-1.10
SELF-EMPLOYED	0.091***	2.28	0.088**	2.19
RETIRED	0.116***	3.26	0.117***	3.24
AT HOME	0.138***	3.92	0.153***	4.31
STUDENT	-0.097**	-2.09	-0.096**	-2.03
UNEMPLOYED	-0.066*	-1.84	-0.049	-1.34
OTHER	0.122*	1.81	0.159**	2.33
Religiosity				
CHURCH ATTENDANCE	0.015***	3.99	0.015***	3.92
REGIONAL FIXED EFFECT	YES			
COUNTRY FIXED EFFECT			YES	
R2	0.028		0.028	
Prob > F	0.000		0.000	

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL TIME EMPLOYEE, EASTERN EUROPE. Significance levels are: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$.

Table A4: Two-stage approach reporting second stag regressions

Second Stage Regression	Coeff.	t-Stat.	Coeff.	t-Stat.
DEP. VARIABLE:	*WEIGHTED OLS*		*WEIGHTED OLS*	
ENVIRONMENTAL MORALE (EM)	(16)		(17)	
	First stage: Decision whether to give socially correct response (littering, tax evasion, bribing, claiming government benefits without being entitled to them, joyriding, lying)			
PERCEIVED ENVIRON. COOPERATION (PL)	-0.120***	-9.96	-0.121***	-9.96
CONCERN FOR SOCIETY	0.018***	14.64	0.018***	14.11
Voluntary Organization				
Environ. Organization	0.058	1.40	0.052	1.24
Demographic Factors				
AGE 30-39	0.135***	4.44	0.133***	4.32
AGE 40-49	0.166***	5.18	0.162***	4.99
AGE 50-59	0.278***	8.01	0.279***	7.98
AGE 60-69	0.332***	7.75	0.337***	7.79
AGE 70+	0.376***	7.64	0.379***	7.61
FEMALE	0.165***	8.70	0.157***	8.21
Formal and Informal Educ.				
EDUCATION	0.007***	3.89	0.007***	3.86
POLITICAL DISCUSSION	0.020	1.45	0.022	1.54
Marital Status				
WIDOWED	-0.034	-0.98	-0.035	-1.00
DIVORCED	-0.081**	-2.34	-0.074**	-2.13
SEPARATED	-0.123*	-1.82	-0.143**	-2.08
NEVER MARRIED	-0.183***	-6.66	-0.183***	-6.59
Employment Status				
PART TIME EMPLOYEE	-0.035	-0.99	-0.015	-0.41
SELF-EMPLOYED	0.038	0.98	0.035	0.89
RETIRED	0.062*	1.78	0.061*	1.74
AT HOME	-0.051	-1.47	-0.038	-1.10
STUDENT	-0.150***	-3.34	-0.149***	-3.28
UNEMPLOYED	-0.072**	-2.08	-0.057	-1.63
OTHER	0.080	1.24	0.123*	1.87
Religiosity				
CHURCH ATTENDANCE	-0.001	-0.13	-0.002	-0.48
REGIONAL FIXED EFFECT	YES			
COUNTRY FIXED EFFECT			YES	
R2	0.104		0.104	
Prob > F	0.000		0.000	

Notes: Robust standard errors. The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE, EASTERN EUROPE. Significance levels are: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$.

Table A5: Filtered perceived environmental cooperation (EL)

WEIGHTED PROBIT	Coeff.	z-Stat.	Marg. Effects
DEPENDENT V.: ENVIRONMENTAL MORALE (EM)	(21)		
FILTERED PERCEIVED ENVIRON. COOPERATION (PL)	-0.043***	-4.10	-0.015
CONCERN FOR SOCIETY	0.010***	9.05	0.003
Voluntary Organization			
Environ. Organization	0.116***	3.21	0.040
Demographic Factors			
AGE 30-39	0.101***	3.67	0.036
AGE 40-49	0.162***	5.50	0.056
AGE 50-59	0.222***	6.90	0.076
AGE 60-69	0.274***	6.85	0.093
AGE 70+	0.242***	5.12	0.082
FEMALE	0.088***	5.00	0.032
Formal and Informal Educ.			
EDUCATION	-0.001	-0.67	0.000
POLITICAL DISCUSSION	-0.036***	-2.81	-0.013
Marital Status			
WIDOWED	-0.037	-1.08	-0.013
DIVORCED	-0.083***	-2.65	-0.030
SEPARATED	-0.102*	-1.65	-0.037
NEVER MARRIED	-0.113***	-4.58	-0.041
Employment Status			
PART TIME EMPLOYEE	-0.128***	-3.96	-0.047
SELF-EMPLOYED	0.048	1.34	0.017
RETIRED	0.104***	3.14	0.037
AT HOME	0.175***	5.33	0.060
STUDENT	-0.159***	-3.92	-0.059
UNEMPLOYED	0.011	0.36	0.004
OTHER	0.092	1.45	0.032
Religiosity			
CHURCH ATTENDANCE	0.010***	2.97	0.004
REGION	YES		
COUNTRY			
Pseudo R2	0.023		
Number of observations	32433		
Prob > chi2	0.000		

Notes: The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE, LOWEST CLASS, EASTERN EUROPE. Probit = original version (see EQ1, Table 1). Significance levels are: * 0.05 < p < 0.10, ** 0.01< p <0.05,*** p < 0.01.

Table A6: Filtered perceived environmental cooperation (EL)

WEIGHTED PROBIT	Coeff.	z-Stat.	Marg. Effects
DEPENDENT V.: ENVIRONMENTAL MORALE (EM)	(22)		
FILTERED PERCEIVED ENVIRON. COOPERATION (PL)	-0.030**	-2.53	-0.010
CONCERN FOR SOCIETY	0.017***	13.94	0.006
Voluntary Organization			
Environ. Organization	0.103***	2.64	0.035
Demographic Factors			
AGE 30-39	0.096***	3.36	0.033
AGE 40-49	0.157***	5.13	0.053
AGE 50-59	0.245***	7.37	0.081
AGE 60-69	0.323***	7.81	0.105
AGE 70+	0.326***	6.65	0.105
FEMALE	0.140***	7.65	0.049
Formal and Informal Educ.			
EDUCATION	0.002	1.15	0.001
POLITICAL DISCUSSION	-0.006	-0.44	-0.002
Marital Status			
WIDOWED	-0.046	-1.30	-0.016
DIVORCED	-0.053	-1.62	-0.019
SEPARATED	-0.136**	-2.10	-0.049
NEVER MARRIED	-0.138***	-5.30	-0.049
Employment Status			
PART TIME EMPLOYEE	-0.096***	-2.90	-0.034
SELF-EMPLOYED	0.008	0.22	0.003
RETIRED	0.066*	1.93	0.023
AT HOME	0.013	0.38	0.005
STUDENT	-0.184***	-4.36	-0.067
UNEMPLOYED	-0.008	-0.23	-0.003
OTHER	0.061	0.97	0.021
Religiosity			
CHURCH ATTENDANCE	-0.008**	-2.06	-0.003
REGION			
COUNTRY	YES		
Pseudo R2	0.095		
Number of observations	30691		
Prob > chi2	0.000		

Notes: The reference group consists of AGE<30, MALE, MARRIED, FULL-TIME EMPLOYEE, LOWES CLASS, EASTERN EUROPE. Probit = original version (see EQ1, Table 1). Significance levels are: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01.

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