Endogenous green preferences*

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Abstract

Low public support often impedes stronger environmental policies, but if they are enacted, do policy preferences change? Using surveys covering 38 countries around the world, we study the dynamics of environmental policies and individual preferences over time. Exploiting within-country, across birth-cohort variation, we document that cohorts exposed to more stringent policies in the past are more supportive of environmental policies at the time of the survey, with the effect largely driven by exposure during early adulthood. This relationship suggests that a society's environmental policy attitudes evolve endogenously, with implications for normative frameworks used in welfare economics.

Keywords: Endogenous preferences; Environmental policy; Environmental preferences; Formative age; Policy support

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1 Introduction

Environmental externalities can be effectively addressed through sufficiently stringent policies. However, stringent environmental policies, like carbon taxes, have been obstructed by low public support (Douenne & Fabre, 2022). While public support naturally influences policy outcomes, it is traditionally modelled as fixed, invariant to influence from experience with policies (Stigler & Becker, 1977). But if relationships are bi-directional, i.e., public preferences influence subsequent policy outcomes and policy outcomes influence public preferences, then the resulting endogenous relationship affects the evolution of policy.[1] Understanding how green policy preferences evolve is essential, particularly in light of the increasing urgency to address environmental challenges (Dechezleprêtre et al., 2022). Recent theoretical models allow for individuals' consumption preferences to evolve endogenously, enriching the analysis on the dynamics of various environmental behaviors (Besley & Persson, 2023; Konc et al., 2021; Mattauch et al., 2022). Empirically, however, it remains an open question whether individuals' preferences for green policies evolve differently in response to exposure to stringent policies compared to more lenient ones.

If voter preferences are exogenous and information perfect, personal experience with policies would not shape an individual's views. But, alternatively, voters could update their views of the normative appropriateness of policies, once exposed to them. Using global survey data from the Integrated Value Surveys (IVS) and an internationally comparable measure of environmental policy stringency, we test this hypothesis in 38 countries over 20 years. We exploit within-country, cross-cohort variation in individual exposure to environmental policy stringency to determine whether birth cohorts exposed to more stringent environmental policies are more supportive of environmental

[1]Previous studies document that public support influences policy outcomes (List & Sturm, 2006). Theoretical and empirical analyses model how bidirectional causation between preferences and policy complicates the evolution of policies (Alesina & Giuliano, 2015; Alesina & Rodrik, 1994; Besley & Persson, 2019; Gerber & Jackson, 1993). Fuchs-Schündeln and Schündeln (2015) show that support for democracy increases with time under the system, resulting in endogenous political preferences. Acemoglu et al. (2024) find a similar result with the effect stronger in democracies that provide economic growth, peace, political stability, and public goods. Aksoy et al. (2020) find that legal same-sex relationship recognition policies improve attitudes toward sexual minorities.

policies at the time of the survey. We account for potential confounds, such as exposure to environmental and economic conditions, country-specific shocks at the time of the survey, generational variations, and country-specific age-specific factors.

We find that individual experience with more stringent environmental policies strengthens subsequent preference for them, implying endogeneity of preferences. As experience with policy reshapes norms, even societies with tepid initial support for stringent policy find themselves increasingly supportive over time. Increasing by 1 standard deviation exposure to environmental policy stringency increases by 0.18 of a standard deviation individual support for government intervention to reduce pollution. The effect is evident even on specific policy instruments. Tax stringency exposure, and in particular CO_2 and fuel tax, has a strongly positive effect on subsequent preferences for environmental taxes.

All past exposure to policy is not equal in its effect.[2] We find strong evidence that policy exposure during the formative age window of 18-25 has a large impact, in line with a growing literature.[3] Policy stringency in any other age windows does not meaningfully alter individual preferences at the time of the interview. When we compare formative age policy exposure to contemporaneous exposure at the time of the interview, we document an asymmetry of reference points (De Neve et al., 2018). Demand for government action is most pronounced among individuals who experienced a reduction in stringency since their formative age window. Finally, we document a larger effect of policy exposure conditional on poor environmental quality exposure during the formative age window (as measured by fine particulate matter and household air pollution).

Armed with the estimated effects of policy stringency exposure on environmental

[2]Studies document the high salience of environmental policies, particularly those regulating air pollution (Eshbaugh-Soha, 2006). Policies are shown to be salient in the business community (Noailly et al., 2021) and among consumers (Rivers & Schaufele, 2015).

[3]The "formative age" or "impressionable years" hypothesis, first studied in Krosnick and Alwin (1989), states that values are formed during early adulthood and do not substantially change afterward. This hypothesis has recently been tested on a variety of settings in economics (Carreri & Teso, 2023; Cotofan et al., 2024; Eichengreen et al., 2021; Eichengreen et al., 2024). Giuliano and Spilimbergo (2024) review this literature on the effect of aggregate shocks on preferences.

preferences, we produce a simple counterfactual exercise. We select three countries with historically different environmental policy levels (Brazil, US, Sweden) and produce hypothetical global preferences if birth-cohorts had been exposed to each of these policy counterfactuals. We document stark differences in public support under each counterfactual, ranging from 85% of the countries in the sample with lower green preferences than historically observed, had individuals been exposed to Brazil's history of policy stringency, to 77% of countries with higher preferences under Sweden's policy counterfactual.

Our results suggest that strong opposition to certain environmental policies may not reflect lasting preferences. Rather, how preferences evolve will depend in part on which policy outcomes are realized.[4] Though introducing more stringent policies may be seen as unacceptable, a counterfactual exercise in which stringent policy were reversed may also be unacceptable. If a society's norms can change, we would expect differences in support between an ex-ante proposal and an ex-post review of a policy.[5]

Rising interest in the co-dynamics of climate policy stringency and public support has spurred recent work on modeling endogenous preferences over consumption choices in the economics of climate change (Konc et al., 2021; Mattauch et al., 2022). Country-specific evidence suggests endogenously evolving support for green policies. In British Columbia, initially tepid support for a carbon tax policy that became law grew substantially in the subsequent years (Murray & Rivers, 2015). Vice versa, in France, after a carbon tax failed amid widespread social protest, the popularity of such policies appears to have declined further.[6] But these individual cases make it difficult to draw a comprehensive picture. To the best of our knowledge, our paper is the first

[4]Low support has been directly expressed through referenda in Washington State (Anderson et al., 2023), Switzerland (Bornstein & Lanz, 2008; Carattini et al., 2017), and California (Burkhardt & Chan, 2017; Holian & Kahn, 2015; Kahn & Matsusaka, 1997), and social protests in France (Douenne & Fabre, 2020, 2022). Carattini et al. (2018) review the barriers to public support for carbon taxes.

[5]Experience could foster comfort with policy settings that are familiar (Furnham & Boo, 2011; Tversky & Kahneman, 1974), and rules and other instruments can influence cultural norms for which individuals assign intrinsic value (Bezin, 2015; Bisin & Verdier, 2001, 2011; Schumacher, 2015).

[6]In Douenne and Fabre (2020), support in France for a carbon tax and rebate was 38% in early 2019. In Dechezleprêtre et al. (2022), 29% of French respondents supported the policy in May 2021.

cross-national attempt to study endogenous environmental preferences over policy options and estimate the causal effect of experience with policy in a quasi-experimental setting, accounting for a range of potentially important co-factors, including environmental quality levels. Endogenous support alters the predictability of the policy path over time, with implications for notions of paternalism and the moral and political economy of policy selection that we discuss in the conclusion.

2 Theoretical Motivation

Why might we expect policy and preferences to evolve endogenously? Policy exposure could change norms and the information set used by individuals. We provide theoretical motivation for our empirical work by exploring each of these mechanisms.

2.1 Norms

Traditionally, individuals' preferences over environmental policy can be represented by a conventional utility function, such that $U(\psi) = \mu(c(\psi), q(\psi))$, where c and q represent consumption and environmental quality, each a function of policy stringency $\psi \in \Psi$ (i.e., the price of polluting via a Pigouvian tax or a shadow price).

In our framework, individuals can form policy norms based on past experience, defined as ψ_R. A norm, in our context, anchors preferences toward policy settings in the past and can make individuals hesitant to deviate from the past. Deviation of the present policy ψ from the norm ψ_R can affect utility $V[\cdot]$, represented as follows:

$$
\begin{aligned}
V[\psi \mid \psi_R, \alpha, \beta, \gamma] \; = \; & \mu(c(\psi), q(\psi)) && (1)\\
& - \alpha \cdot d_1(c(\psi), c(\psi_R)) && (2)\\
& - \beta \cdot d_2(q(\psi), q(\psi_R)) && (3)\\
& - \gamma \cdot d_3(\psi, \psi_R) && (4)
\end{aligned}
$$

The first term of the utility function conveys a trade-off between utility from traditional consumption and environmental quality; lines (2)-(4) represent the consequences to utility of deviating from consumption, environmental quality and policy norms (where $\alpha, \beta, \gamma \geq 0$, and d_1, d_2, and d_3 are distance functions). An individual chooses their subjective policy stringency such that

$$\psi^* = \underset{\psi \in \Psi}{\operatorname{argmax}} \; V\left[\psi \mid \psi_R, \alpha, \beta, \gamma\right] \tag{5}$$

Changes in policy norms do not affect the traditional utility element (line 1), but exert an influence on the optimal stringency level through lines (2)-(4). When at least one of $\alpha, \beta, \gamma > 0$, the derivative of ψ^* with respect to the policy norm ψ_R is unambiguously positive under a set of reasonable conditions.[7]:

$$\frac{\partial \psi^*}{\partial \psi_R} > 0 \tag{6}$$

When the current policy level $\psi_t < \psi^*$, an individual would have stronger environmental policy preferences, expressed by more support for government involvement in reducing pollution or increases in environmental taxes.

2.2 Learning

Environmental policy exposure may also affect individual preferences through endogenous learning. Consider a policy level ψ. The value of a policy setting $V(\psi)$ represents the net benefit (or cost). For simplicity, let V(ψ) be a quadratic function, e.g., $-(\psi - b)^2$, with a unique interior optimum, $\psi^* = b$. A person choosing whether to support more or less government involvement in reducing pollution must consider whether ψ_t is above or below ψ^* without full knowledge of the function $V(\psi)$.[8] Determining this is similar

[7]For continuously differentiable distance functions, such as $(\psi - \psi_R)^2$, the implicit function theorem is sufficient to show Result (6) for any interior optimum ψ^*. For a much broader set of distance functions, Result (6) can be shown for any function that satisfies the single crossing condition with respect to ψ_R (Milgrom & Shannon, 1994).

[8]To put this another way, a person must determine $V'(\psi_t)$.

to the econometrician's task of estimating the relationship between ψ and $V(\psi)$ using only sampled observations of each. The sample of ψ is determined by knowledge from policy levels in the past, and $V(\psi)$ is observed from the environmental and economic conditions that ensue. The larger and more varied the sample in ψ, the easier to form an accurate sense of whether it is better to support or oppose a stringency proposal.

Broadly, we interpret learning as obtaining evidence about the effects of a policy setting on environmental quality, the economy, or any other welfare-relevant variable. We can expect positively endogenous green preferences if the public believes, in the absence of past evidence, that $\psi_t \geq \psi^*$, when in fact $\psi_t < \psi^*$.

Our main findings could be a result of the norms and the learning channel. We explore the relative importance of these channels empirically in Section 5.3.4.

3 Data

We use individual survey data from the Integrated Value Surveys (IVS), which harmonize the European Values Study (EVS) and the World Value Survey (WVS). These large-scale cross-national surveys gather data on socio-political, environmental attitudes, and other characteristics of individuals (Aghion et al., 2023).

We focus on two measures of environmental preferences: (i) "Government should reduce environmental pollution",[9] (ii) "Increase in taxes if used to prevent environmental pollution". For both questions, answers can be 1 ("strongly disagree"), 2 ("disagree"), 3 ("agree") and 4 ("strongly agree"). To exploit all the variation in survey responses, we use the 4-point Likert scale as the main outcome (see Appendix A.1 for details).

Our measure of environmental policy exposure comes from the OECD Environmental Policy Stringency Index (EPS), a country-specific and internationally-comparable measure. Stringency is defined as the degree to which environmental policies put an

[9]Respondents can interpret the question as asking the appropriate role of government and as support for immediate actions to reduce pollution. Each is relevant to the question of endogeneity of preferences and the implication of such endogeneity on how policy evolves. We show that the survey question is meaningful and predictive of future policy outcomes in Appendix B.

explicit or implicit price on polluting or environmentally harmful behavior (Kruse et al., 2022). The index is constructed by scoring policy stringency on a scale from zero to six and subsequently aggregating the scores into an index, where higher levels are associated with more stringent policies.

Our main variable $policy\ exposure_{bct}$ for an individual born in year b in country c interviewed in year t is defined as:

$$policy\ exposure_{bct} = \frac{1}{t-(b+18)} \sum_{\tau=b+18}^{t} policy\ stringency_{c,\tau} \tag{7}$$

An individual's $policy\ exposure_{bct}$ is the average environmental policy stringency in their country between age 18 and the year of interview. Environmental policy preferences are recorded discontinuously from 1990 to 2010. Respondents interviewed in the same year and country can have different treatment exposure because of variation in their year of birth. To test for the "formative age" hypothesis, we construct the average policy exposure when the respondent was aged 18 to 25 and other eight-year age window exposures starting from the range of the impressionable years. Since certain countries exhibit a positive trend over time, we also construct two alternative measures as a robustness test. First, before constructing the measure of exposure to policy, we de-mean each country's level of environmental policy from the annual cross-country average. This procedure accounts for policies implemented at supra-national levels which would contemporaneously make more stringent several countries (e.g., the EU Emissions Trading System). Second, we de-trend the policy stringency from a country-specific linear trend (see Appendix A.2 for details).

We use two indicators from the Environmental Performance Index (Wolf et al., 2022) to measure environmental quality. We consider PM2.5 and Household Air Pollution (HAP) measured as the number of age-standardized disability-adjusted life-years lost per 100,000 people, respectively due to exposure to fine air particulate matter smaller than 2.5 micrometers, and to household air pollution from the use of household solid fuels. We recode the measures such that higher values indicate higher quality and construct environmental quality exposure similar to policy exposure (see Appendix A.3

for details).

4 Empirical Approach

To test whether experience with policies feeds back into preferences for policies, we adopt an empirical approach that exploits within-country, across-birth-cohort variation in policy stringency, and removes confounds such as national economic, political, and environmental conditions at the time of interview. Our baseline specification is

$$Y_{ibctw} = \beta_1 policy\ exposure_{bct} + X_i'\boldsymbol{\gamma} + Z_{bct}'\boldsymbol{\delta} + \kappa_b + \mu_{ct} + \alpha_w + \theta_c \times age + \varepsilon_{ibctw} \quad (8)$$

where Y_{ibctw} is the answer to one survey question by individual i, born in year b interviewed in year t in country c in survey w. Our coefficient of interest is associated with exposure to environmental policy stringency, *policy exposure*, which varies across countries, years of birth, and years of interview. We control for a set of individual covariates X_i' at time of interview (gender; employment status; education; ten country-specific income decile dummies). Most importantly, other past experiences could be correlated with environmental policy stringency and influence environmental preferences. To capture these exposures, we control for a vector of country-cohort specific covariates Z_{bct}', including environmental quality (PM2.5 and HAP exposure) and economic conditions (average number of years in which GDP growth contracted by at least 10%).

Our specification accounts for birth-cohort κ_b, country-year of interview μ_{ct}, and survey (WVS or EVS) α_w fixed effects, as well as country-specific age trends $\theta_c \times age$. All regressions are estimated using OLS for ease of interpretation, but similar results are obtained with ordered probit and probit models. We cluster standard errors at the country-year-of-interview level. We use survey sample weights to make the data representative at the country level and limit our sample to individuals born in the same country in which they are interviewed.

Identification Strategy. There are several potential threats to the identification of a causal effect of policy exposure on environmental preferences, which would imply endogeneity of preferences. Spurious correlations may arise due to reverse causality (i.e., countries have more stringent policies because citizens have strong environmental values), or unobserved confounders, such as historic events or economic conditions, that could co-determine individuals' preferences and policy levels in place.

We exploit within-country variation at the birth-cohort level in exposure to environmental policy stringency to establish a plausibly causal impact of experience with environmental policies on green preferences. Below, we detail how our specification addresses a number of potential threats to identify such an effect.

First, age-specific factors could matter if different birth cohorts are exposed to different policies with different probabilities. The global positive trend in environmental policy stringency may suggest that younger generations are more likely to experience more stringent policies. We control for birth-year fixed effects, which account for cohort-specific attitudes so as to compare individuals within the same birth cohort.

Second, contemporaneous levels of environmental policy and quality and any other national and global economic and political conditions may drive differences in preferences. We account for any contemporaneous country-specific characteristics with country-year-of-interview fixed effects. This approach mitigates concerns that the results are driven by other structural time-varying differences between countries and strengthens the assertion that observed differences in attitudes towards environmental policies constitute a change in intrinsic preferences due to differences in the stringency of environmental policy exposure.

Third, there could be heterogeneous generational trends in environmental preferences across countries. Countries could lie on differential trends in the evolution of individual values which can lead to larger differences across generations. To rule out such a possibility, we include country-specific age trends in our specification.

Finally, we also account for the source of the survey fixed effects (WVS or EVS), to account for different sampling methodologies and other differences across the two survey sources.

The set of fixed effects ensures that the identifying variation comes from changes in exposure to environmental policy stringency across birth cohorts within a country interviewed in a given year. Although we saturate our specifications with fixed effects, there could remain confounding past exposures correlated with environmental policies, which we address by controlling for economic conditions and environmental quality.

To emphasize the role of the fixed effects, Appendix Figure C1 shows the unconditional correlation between survey answers and environmental policy stringency exposure, negative and statistically significant at the 95% level (Panel a), and the strongly positive and statistically significant relationship between the residual variation in preferences and policy exposure (Panel b). Our set of fixed effects accounts for potential confounders that change the direction of the association between preferences and policies. For instance, consider that a relatively stringent country is likely to have been relatively stringent in the past and have lower pollution levels at time of interview. Low pollution levels should predict weaker support for government action than would be expected in countries with high pollution. Including country-year-of-interview fixed effects allows us to isolate the role of variation in past policy exposure, while removing the confounding influence of variation in contemporaneous environmental quality, policy stringency, and economic conditions.

5 Results

5.1 Adulthood exposure

Table 1 reports the estimates from our baseline specification. The coefficient on environmental policy stringency exposure is positive and statistically significant, in line with the theoretical prediction. In our preferred and most conservative specification that accounts for economic recessions and environmental quality (column 5), increasing EPS exposure by 1 standard deviation (SD) increases individual support for government to reduce pollution by 0.18 SD. In other words, an increase in policy stringency from the US level (2.91) to Sweden's level (3.61) in 2019 corresponds to a 5.7% increase in the Likert support for government to reduce pollution. Our results provide suggestive evidence of endogenous green policy preferences, highlighting a bidirectional relationship between policy stringency and preferences.[10]

Types of environmental policies. The EPS is a composite index of different environmental policies. Different policy instruments can have different salience. Some policies may attract more political and media attention, others may be more noticeable in perceptions or experiences with cost burden or incidence (Huse & Koptyug, 2022; Rivers & Schaufele, 2015). Using various sub-indices of the EPS index (market-based instruments, non-market-based instruments, environmental taxes, and carbon trading schemes), we find no conclusive evidence that the effect of policy stringency on support for government to reduce pollution is solely driven by a specific sub-category of policy instruments (Appendix Figure C2).

Nevertheless, we document heterogeneous effects of environmental policies on preferences for a specific policy instrument, environmental taxes. Figure 1 displays the estimated coefficients on various dimensions of past environmental policy exposure. More stringent exposure to taxes increases support for an increase in tax to prevent pollution. A 1 SD increase in environmental tax stringency exposure is associated with a 0.12 SD increase in the support for a green tax increase. Using the same real-world comparison as before, an increase from the US environmental tax stringency level (0.25) to Sweden's level (3.75) corresponds to a 18% increase in the Likert support for increase in tax to prevent pollution. Importantly, past exposure to non-market green policies has a negative and statistically insignificant relationship with green tax preference.

Results have more pronounced statistical significance and larger magnitude for the stringency of combined carbon and diesel taxation. A 1 SD increase in exposure to these policy instruments increases subsequent tax support by around 0.17 SD. By disentangling CO2 and diesel tax exposure, the effect is mostly driven by carbon tax.

[10] As noted in Section 1, previous work documents the relatively uncontroversial of the two directional relationships: the effect of preferences on policy outcomes. We also show empirical evidence of past preferences predicting future policy outcomes in Appendix B.

Environmental tax policies are one of the most salient policy instruments (Dechezleprêtre et al., 2022; Douenne & Fabre, 2022). We document that past exposure to them affects preference formation. Thus, specific policy types appear to reflect the dynamics of positive feedback that we document at the composite EPS level. Well-documented initial skepticism about taxes (Anderson et al., 2023; Douenne & Fabre, 2020) could make tax policies especially well-suited to the positive endogeneity that arises from experience. Exposure to specific policy types (as in, policy design or mechanism) might mediate the effect of experience on preferences.[11]

Robustness. We conduct several tests to probe the robustness of our results (see Appendix C.2). We find coefficients quantitatively very similar to our baseline with alternative measures of policy stringency de-meaned from the annual cross-sectional average and de-trended from a country-specific linear trend. We examine the influence of starting age, and find that the effect becomes more robust from age 16 across all policy exposure measures. This result supports our hypothesized channel of norm formation, which requires awareness of and influence by policy stringency, and becomes likelier approaching adulthood.[12] Results are also robust to alternative fixed effects and estimation methods, using ordered probit, probit and linear probability models. In the latter exercise, increasing stringency exposure from the US level to Sweden's level in 2019 increases the probability by 5 percentage points (7.5% at the mean) of expressing that government should reduce pollution and of strongly agreeing by 9.4 p.p. (31%).

Falsification test. To mitigate concerns that the effect of environmental policy exposure on environmental preferences conflates the consequences of general social and political changes, we consider attitudinal survey questions unrelated to the environment on family relationships, societal well-being, and economic values. Using 13 alternative outcomes, we find no statistically significant effect, except for one at the 5% level,

[11] Unfortunately, the survey does not ask other questions about support for additional pollution policy types, so we cannot test, e.g., the effect of non-market policy exposure on support for them. Given the limited salience and higher costs of non-market policies, dynamics could be different.

[12] Differently than exposure to democratic institutions which are assumed to be understood by individuals as of age of six (Acemoglu et al., 2024), environmental policies and their effects are posited to be internalized from adult life (Aklin et al., 2013).

consistent with sampling variation attributable to multiple tests (see Appendix C.3).

5.2 Age windows

Individual preferences are particularly malleable during certain years of life (Severen & Van Benthem, 2022). An expanding literature documents how values, norms, and preferences can be shaped by exposure to conditions and events, most notably in early adulthood. The formative age (or impressionable years) hypothesis states that individual values are formed during a period of great mental plasticity in early adulthood between 18 and 25 years and remain unaltered afterward (Krosnick & Alwin, 1989).[13]

We construct measures of policy stringency exposure in various eight-year age windows, starting from the 18-25 window. Figure 2 reports the coefficients on each eight-year age window, with the formative age window's coefficient in red. This coefficient is the only statistically significant estimate and is comparable in magnitude to the effect of exposure from age 18 to the year of interview, suggesting no evidence of the effect getting smaller as an individual acquires more information throughout their life. A 1 SD increase in formative age exposure to environmental policy stringency is associated with 0.16 SD increase in support for government intervention to reduce pollution.

Robustness. In Appendix D.1, we probe the robustness of our results to a variety of checks, including binary versions of the outcome, alternative definitions of formative age, de-meaned and detrended exposure measures, and measuring exposure over four-year age windows. A final potential concern is that societal preferences during formative age window confound the role of stringency exposure. To allay this concern, we show that controlling for national average environmental policy preferences during the respondent's formative age does not significantly alter the effect of policy exposure

[13] Other relevant work in social psychology includes Cutler (1974) and Torney and Hess (1967). Empirical evidence of the impressionable years hypothesis has been documented for attitudes towards migrants (Cotofan et al., 2024) and democracy (Magistretti & Tabellini, 2022), confidence in political institutions and leaders (Eichengreen et al., 2024), job preferences (Cotofan et al., 2023), political preferences (Barone et al., 2022), preferences for redistribution (Carreri & Teso, 2023; Roth & Wohlfart, 2018), and trust in science (Eichengreen et al., 2021). The only paper about environmental preferences considers formative age exposure to natural disasters (Falco & Corbi, 2023).

(see Appendix D.2). By doing so, we also rule out exposure to societal beliefs correlated with policy stringency during the same age window as an important alternative explanation. This bolsters the causal interpretation of stringency exposure.

5.3 Mechanisms

5.3.1 Environmental policy direction

The importance of the impressionable years indicates that distant experiences play a role in shaping preferences today. Nevertheless, policies can vary widely over time, and a natural question arises about whether changes to higher or lower stringency than formative age levels lead to different effects on present-day preferences. Without specifically testing for this heterogeneity, one might incorrectly assume that past exposure shapes preferences symmetrically (De Neve et al., 2018).

To test for asymmetric effects, we compare formative age exposure with the contemporaneous level of policy stringency in a binary variable (Δ policy), equal to one if the contemporaneous policy is less stringent than the formative age level (i.e., "Negative"). Figure 3a displays the marginal effects of formative-age policy exposure and shows that this asymmetry exists. The effect of formative-age exposure is more pronounced among individuals interviewed when the policy environment is more lax. For two individuals in the same birth-cohort but interviewed in different years, experiencing a more lenient policy in the year of interview drives a stronger reaction to an increase in stringency exposure in terms of a support for government action against pollution.

We compare exposure during any age window to the current level of policy stringency and fail to recover a similar effect using exposure in any other age window than the formative age (Appendix E.1). This result suggests that this specific period has a prominent role as a reference point against which individuals evaluate the current state (Abel, 1990; Coppock & Green, 2016; Roth & Wohlfart, 2018).

5.3.2 Environmental quality role

We also explore whether the effect of more stringent environmental policies on individual support is conditional on environmental quality. We conjecture that more stringent policies where environmental quality is low increase the policies' salience and perceived value to individuals. This, in turn, increases lasting support for government action to reduce pollution.

We construct an indicator if PM2.5 or HAP exposure is below the sample median (i.e., worse environmental quality). Figure 3b shows the heterogeneous marginal effects of EPS exposure. The results confirm that exposure to stringent policy in predicting support for government pollution reduction is conditional on poor environmental quality. The uninteracted term of exposure to environmental quality below the median is negative and in certain cases not significant. The interacted term identifies the effect of experience of both poor conditions and more stringent policies meant to address them. The significance of this combination shows that stringent policies targeting poor environmental conditions are likelier to build lasting public support for government pollution actions (see Appendix E.2 for details).

5.3.3 Heterogeneity by socio-demographics

We summarize heterogeneous effects of policy exposure by respondents' characteristics (reported in Appendix C.4). There is no substantial heterogeneity across most characteristics (gender, employment status, income, political orientation), except for education: lower-educated individuals are more likely than higher-educated ones to have green preferences as a result of more stringent environmental policies. We also document that the effect of policy exposure is driven by individuals less interested in politics and with less confidence in the government. This may be because individuals with limited political knowledge may be more influenced by their formative experiences than those who regularly update their views. This adds evidence that policy outcomes are critical to convey societal norms. Finally, individuals who think the government should take more responsibility are more prone to support government action to reduce pollution and their support for such actions is more responsive to past policy exposure.

5.3.4 Norms and Endogenous Learning

We identify two mechanisms for endogenous green preferences, norms and endogenous learning, and ultimately find stronger evidence for norms. The learning channel would depend on somewhat strong assumptions, as shown in Section 2.2 (additional details in Appendix E.3). In essence, a required assumption is that age cohorts behave as if using different information, because directly lived experience of policy impacts is weighted more than indirectly obtained information. To produce our baseline results of positive endogeneity, an additional requirement for the learning channel is that individuals are pessimistic about the net benefits of more stringent policies, and that this systematic pessimism is absent or reduced in cohorts with direct, lived experience of policy stringency in the past, and particularly in early adulthood.

Were learning an important channel to correct otherwise pessimistic beliefs, a higher degree of policy experimentation would be predictive of support.[14] In a horse race between the first and the second moment of the policy exposure distribution, coefficients on the standard deviation, as well as its interaction with the average, suggest a modest impact of learning that, even when controlled for, leaves the relatively large effect of average exposure unaltered and suggests a robust role for norms.

6 Counterfactual policy stringency

We use our reduced-form estimates to assess the importance of the endogeneity of preferences to policy exposure in the environmental political process. We answer the following question: if individuals were exposed to another counterfactual policy level, all else equal, how would the change in policy preferences predicted by our model be? We choose as counterfactuals three countries with notable historically different

[14]A literature on learning via policy experimentation discusses the importance of varying policy in order to provide regulators and voters with necessary data to assess causal impacts (Aghion et al., 1991; Warren & Wilkening, 2012; Wieland, 2000; Zhao & Kling, 2003).

policy stringency levels: Brazil (cross-cohort average policy stringency exposure is 0.46), United States (average policy exposure 1.75, close to the cross-country average 1.74), and Sweden (average policy exposure 2.57).

We predict the counterfactual change in green preferences using the difference between the observed level of policy stringency and the counterfactual policy level in each of the three countries, and the associated coefficient on EPS (see Appendix F for details). Figure 4 shows the model-predicted shares of respondents with *strong* green preferences under each counterfactual. If individuals had past environmental policy exposure as stringent as in the US, the average support for green policies would be similar across countries (28.18 observed in the data vis-à-vis 28.11 under the US counterfactual). We observe stark differences in public support if birth cohorts were exposed to a stringency level equal to Brazil's (mean is 14.2) and equal to Sweden's (mean is 38.44). Nine countries under the Sweden counterfactual and four countries under the US counterfactual have a share of public support strictly above 50% (in red). If we simplistically assume a one-to-one mapping between stated green preferences and revealed voting preferences in a majority voting rule system, these cases indicate that countries, upon passing more stringent environmental policies, might set in motion a dynamic loop where stringent policies feed back into higher future demand for policies.

7 Conclusion

We document that support for environmental policies increases significantly when individuals have been exposed to more stringent environmental policies during their adulthood and especially during their formative age. Using data across more than thirty-five countries, we compare individuals in the same birth cohort within the same country across different points in time. We also provide evidence that higher exposure to environmental taxes increases subsequent preferences for environmental taxes, and not for other environmental policy instruments. Similarly, stringent environmental policies have no impact on non-environmental preferences. We document that our effect is stronger among cohorts exposed to a more lenient environmental policy mix in the year of the interview relative to their formative age exposure, as well as among cohorts exposed to lower environmental quality.

This paper reveals that the relationship between environmental policy and public support is bidirectional, and thus endogenous. From a public policy perspective, these results indicate that although implementing major environmental policies might be a politically difficult task, individuals will increase their support for such policies over time. The complex co-dynamics of environmental preferences and policies can make equilibrium policy stringency levels more difficult to predict. The path to an equilibrium policy level, if one exists, would likely follow a different and longer path, with important implications for societal welfare.

Endogenous environmental policy preferences have also implications for moral and political economy. Consider a social planner who determines that an unpopular, misunderstood policy will be broadly appreciated in the fullness of time. Imposing policy, even if deemed welfare-improving, in a manner that contradicts the preferences of individuals is considered paternalistic and can draw objections on ethical grounds. Our evidence that appreciation for the policy will change over time has the potential to weaken the premises underlying such objections. Inertia of policy to appropriately respond to new scientific information or material circumstances is not a reflection of deeply rooted, permanent preferences but, at least in part, a result of a dynamic policy familiarity from past experience.

Regulators and politicians who are accountable to the public over medium or long terms may opt to set policy nearer to the current optimum instead of taking a more gradual approach commonly assumed to be better tolerated by opponents to such measures. Moving faster could be more effective in eventually generating the endogenous support that we document.

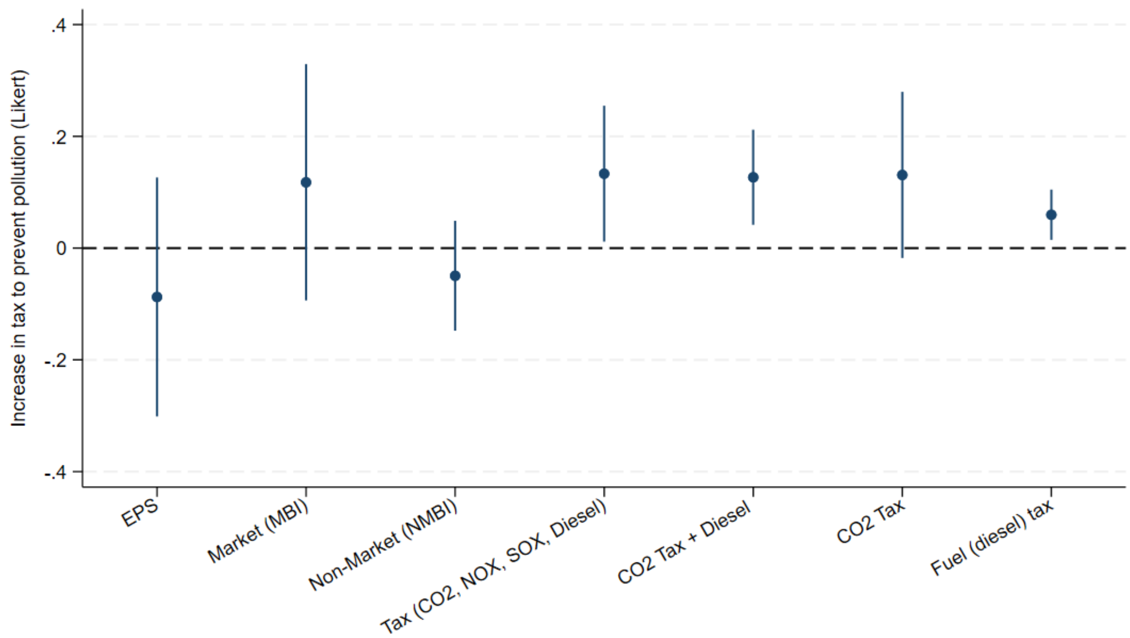
There are important avenues for future research within this area. Given the urgency of climate change, it would be valuable to study climate policy preferences, in isolation from other environmental policy, as data become available. This approach would exploit longitudinal data of public support for carbon taxes and other instruments (e.g., cap-and-trade, subsidies) to evaluate how policy preferences change after a change in climate policy stringency.

Table 1: Environmental Policy Stringency (EPS) exposure during adult years

	Government should reduce pollution (Likert)				
	(1)	(2)	(3)	(4)	(5)
Environmental Policy Stringency (EPS) exposure	0.228**	0.225**	0.219**	0.228**	0.236**
	(0.109)	(0.110)	(0.107)	(0.109)	(0.111)
Recession exposure		-0.515	-0.528	-0.534	-0.518
		(0.381)	(0.406)	(0.378)	(0.392)
PM2.5 exposure			0.0144		0.217
			(0.281)		(0.291)
HAP exposure				-0.305	-0.377
				(0.298)	(0.307)
Individual controls	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓
Mean outcome	2.909	2.909	2.909	2.909	2.909
SD Outcome	0.896	0.896	0.896	0.896	0.896
Mean EPS exposure	0.9	0.977	0.977	0.977	0.977
SD EPS exposure	0.696	0.696	0.696	0.696	0.696
N	16889	16889	16889	16889	16889
adj. R^2	0.1324	0.1324	0.1323	0.1324	0.1323

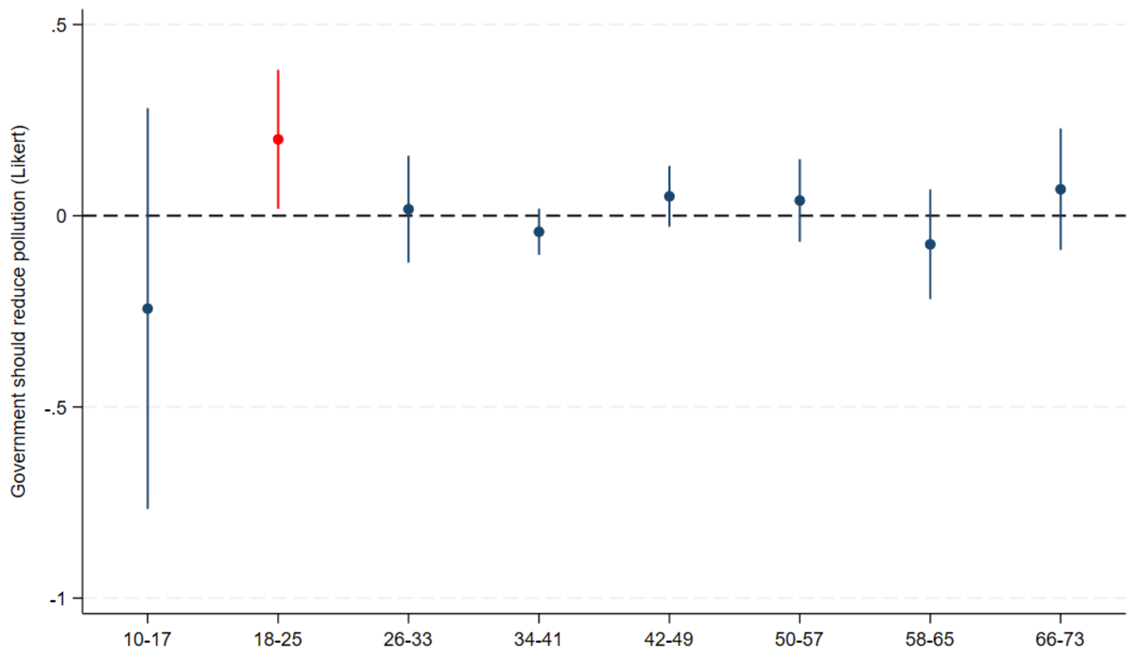
Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during her adult years the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are inverted such that higher values imply higher quality and divided by 1000 to improve readability of coefficients). All regressions also include year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year of interview. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Appendix Table C1 reports the full estimates including controls.

Figure 1: Effect of EPS sub-indices exposure in adulthood on tax increase preferences



Notes: The figure shows the coefficient associated with the average level of sub-index in the x-axis during the adulthood of an individual, using as an outcome the question "Increase in tax to prevent pollution" in the Likert scale. All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure, PM2.5 and HAP exposure. The regression also includes year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 95% confidence intervals around point estimates. Tabular results are reported in Appendix Table C9.

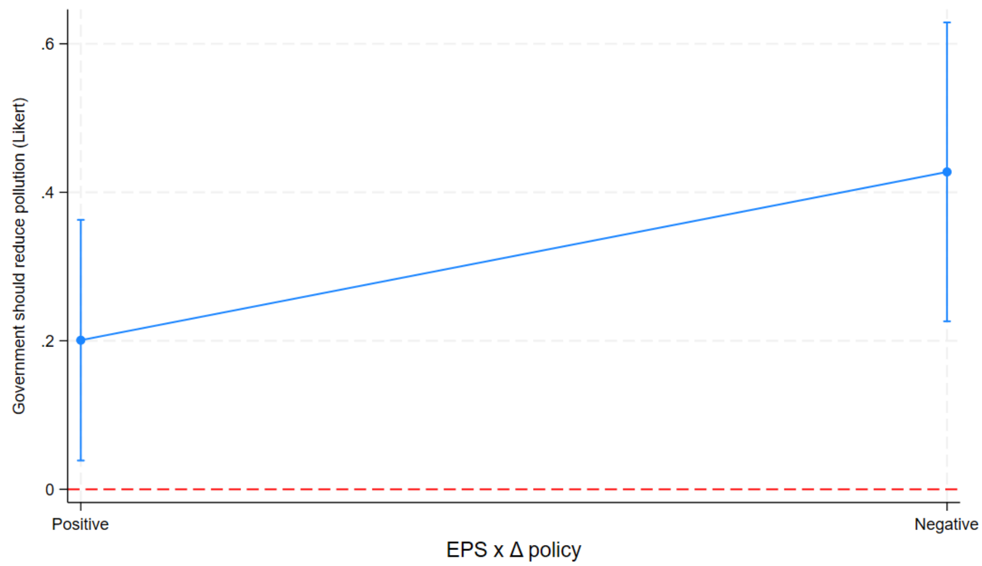
Figure 2: Effect of EPS exposure on environmental preferences by age window



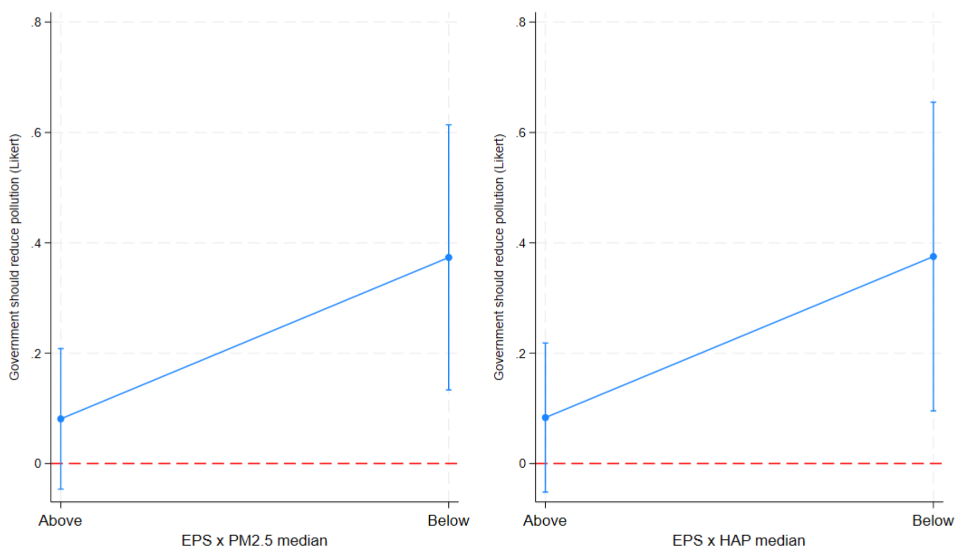
Notes: The figure plots the coefficients associated with the average level of EPS during each eight-year age window reported in the x-axis using the question "Government should reduce pollution" as outcome in Likert scale. The regression controls for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure, PM2.5 and HAP exposure. The regression also includes year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 95% confidence intervals around point estimates. Tabular results are reported in Appendix Table D1.

Figure 3: Heterogeneous effects of policy exposure on environmental preferences

(a) Deviations from contemporaneous policy level

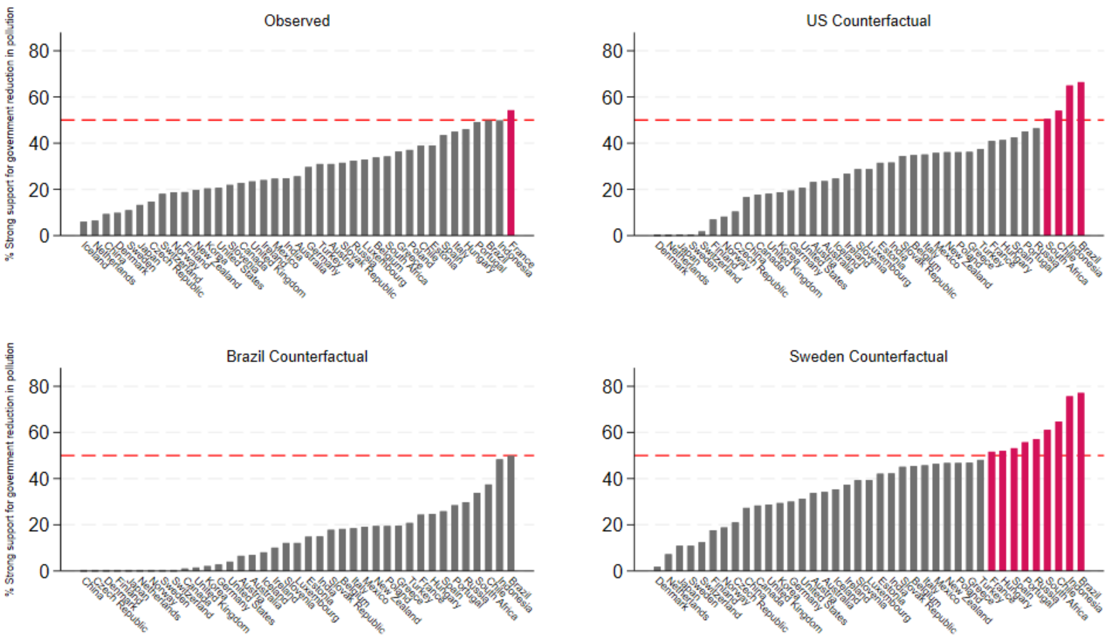


(b) Environmental quality (PM2.5 and HAP) exposure



Notes: The figures plots the marginal effect of EPS exposure in formative age on three different heterogeneity dimensions. Panel (a) interacts EPS exposure with a dummy (Δ policy) equal to one (i.e., negative) when the environmental policy stringency in the year of the interview is lower than the average stringency in the formative age. Panel (b) interacts EPS exposure with a dummy for the exposure to environmental quality measures (PM2.5 and household air pollution - HAP) is above or below the median in the sample (higher values indicate higher quality). Each regression controls for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure, PM2.5, and HAP exposure. The regression also includes the year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 95% confidence intervals around point estimates.

Figure 4: Green preferences for counterfactual policy stringency



Notes: Each histogram reports the share of respondents that strongly agree with the statement "Government should reduce pollution" observed in the country across survey waves (top-left corner histogram) and predicted using three different counterfactual policy experiments. From the top-right corner histogram clockwise, each histogram reports the model-predicted support induced by the difference between the birth-cohort exposure in policy stringency in the country and the exposure in policy stringency experienced by the same birth cohort in the US, in Sweden, and in Brazil. The red dashed line indicates the 50% and countries that are above the line are color-coded in red.

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Online Supplementary Material
"Endogenous Green Preferences"

Table of Contents

A Data Appendix

A.1 Survey Data

The data on environmental attitudes comes from the Integrated Value Surveys (IVS), which harmonize the European Values Study (EVS) and the World Value Survey (WVS). We focus on two measures of environmental preferences that are related to environmental policies and elicit individuals' agreement in a scale from 1 to 4 where responses can be "strongly disagree", "disagree", "agree" or "strongly agree". The first question asks whether "Government should reduce environmental pollution". The second question is "Can you tell me whether you with the following statement: 'I would agree to an increase in taxes if the extra money were used to prevent environmental pollution' ". We also test for robustness by constructing two binary versions equal to one if the respondent chooses either "Agree" or "Strongly agree", and zero otherwise, and a more conservative equal to one only if the respondent chooses "Strongly agree".

The IVS also contains socio-demographic information about the respondents which we use as individual controls in our estimation. In particular, all our regressions control for gender; employment status (defined using a dummy indicating whether the person is unemployed); education (measured using a three-category variable, where lower education means at most primary education, middle education corresponds to at most secondary education, upper education means at least tertiary education). We also control for income in a non-parametric way by including 10 dummies on the country-specific subjective income decile scale.

A.2 Environmental Policy Stringency

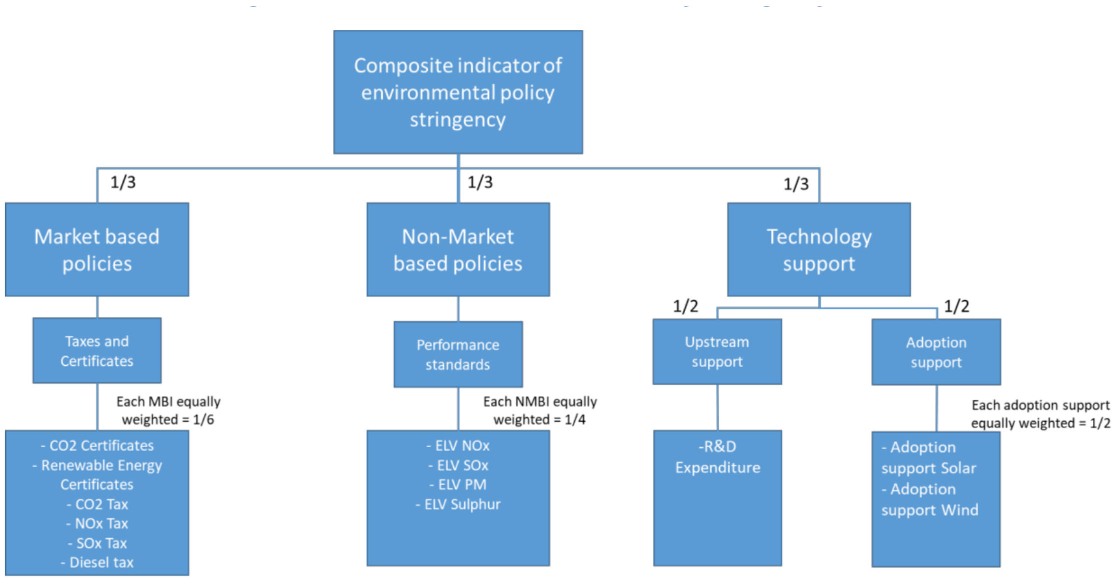
The EPS comprises three sub-indices with equal weight that, in turn, are composed of several policies. The index aggregates the scores given to each policy's stringency on a scale of zero to six. The stringency of environmental policies is measured in different units. As an example, the carbon tax is measured by the tax rate for CO2 emissions, with the raw values in national currency converted to USD/tonne CO2 for international comparison. As another example, the stringency of the fuel (diesel) tax is measured using the tax for a litre of diesel fuel used in transport for industry as a share of the pre-tax diesel price. It is computed by dividing the tax on diesel by the national pre-tax price paid by industry for diesel and the values are converted to USD/Litre.

To aggregate several policy types into a composite index of policy stringency, their stringency is measured on a common scale. For each policy instrument, the raw data is ordered from the least to the most stringent observation across the 1990-2020 period. The lowest score of zero is assigned to observations with no policy in place. The remaining scores are assigned using the distribution of observations that have the policy in place. The highest score of six is assigned to observations with values above the 90th percentile of observations that have the respective policy implemented. To assign the remaining scores, the difference between the 90th and the 10th percentile is divided into five equal bins that define the thresholds (Kruse et al., 2022).

The first sub-index is market-based instruments (MBI) that group policies that put a price on pollution. In particular, it accounts for CO2 Trading Schemes, Renewable Energy Trading Scheme, CO2 Taxes, Nitrogen Oxides (NOx) Tax, Sulphur Oxides (SOx) Tax, Fuel Tax (Diesel). The second sub-index includes Non-Market Based instruments (NMBI), entailing policies that mandate emission limits and standards: Emission Limit Value (ELV) for nitrogen oxides (NOx); ELV for sulphur oxides (SOx); ELV for Particulate Matter (PM); Sulphur content limit for diesel. The final sub-index, Technology Support (TS), entails that support innovation in clean technologies and their adoption, including Public research and development expenditure (R&D) and Renewable energy support for Solar and Wind. Each component of the sub-index has equal weight within each sub-index (i.e. MBI components have 1/6 weight, NMBI components have 1/4 weight and TS components have 1/2 weight).

We construct policy exposure as detailed in the main text in Section 3. Environmental policy preferences are recorded from 1990 to 2010, with certain gaps. Respondents interviewed in the same year and country can have different treatment exposure because of variation in their year of birth. Figure A2 shows the density distribution of

Figure A1: Construction of Environmental Policy Stringency Index

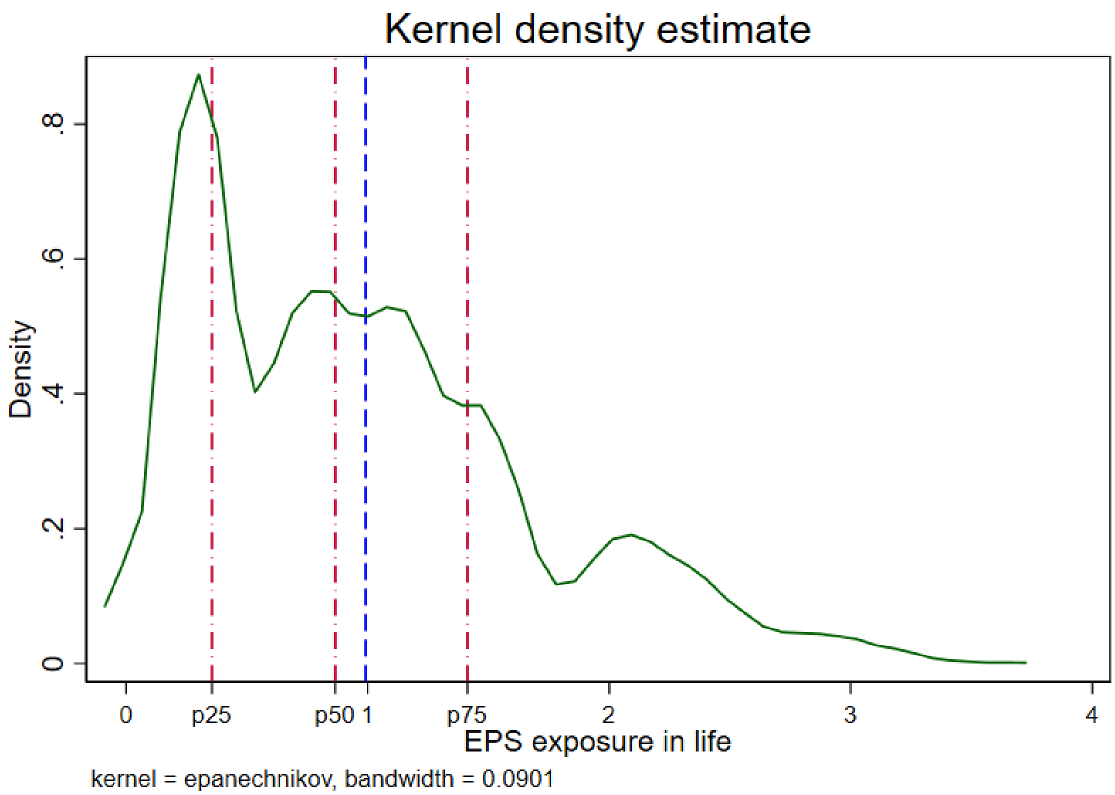


Notes: The figure shows the aggregation structure of the revised EPS index from Kruse et al. (2022).

EPS exposure in the final estimation sample. The average stringency is close to one, with the distribution right-skewed. Figure A3 shows the distribution by country. Since most countries exhibit a positive trend over time (Figure A4), we also construct two alternative measures of policy stringency. First, we de-mean each country's level of environmental policy from the annual cross-sectional average. This procedure accounts for policies implemented at supra-national levels which would contemporaneously make more stringent several countries (e.g., the EU Emissions Trading System). Second, we de-trend the policy stringency from a country-specific linear trend. Figure A5 shows the time series of the birth-cohort exposure (averaged across years of interview) for the two alternative measures of EPS exposure for each country.

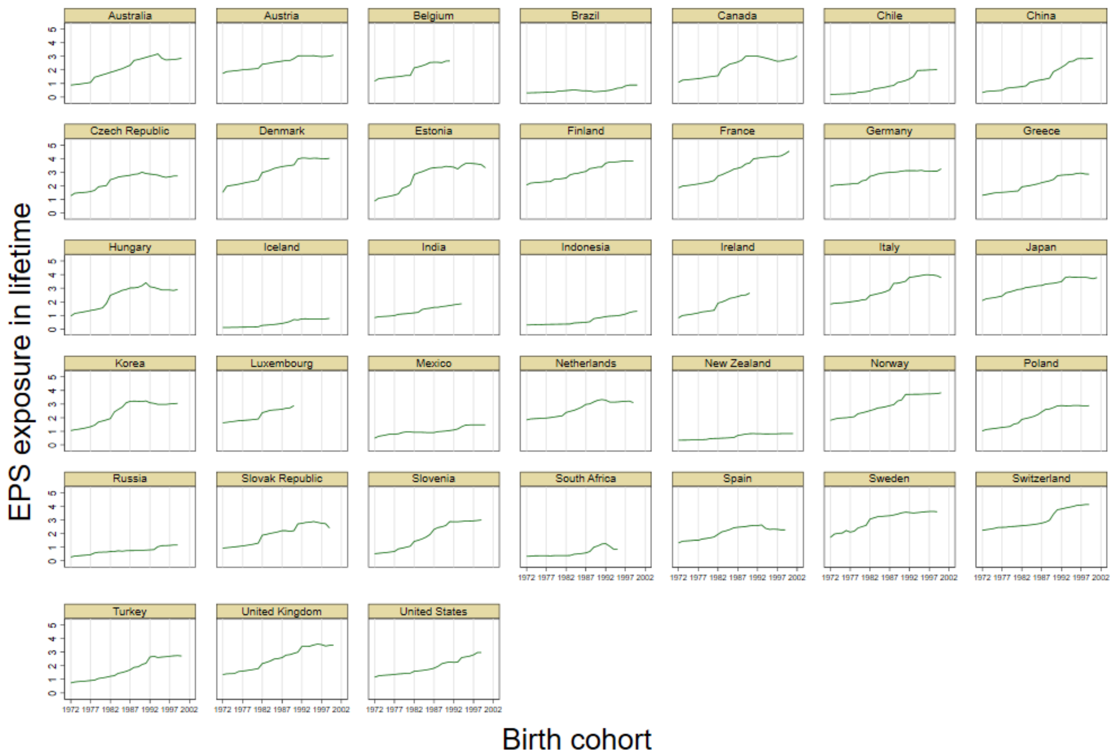
To test for the "formative age" hypothesis, we construct the average policy exposure when the respondent was aged 18 to 25. Appendix Figure A6) displays the formative age exposure for each birth cohort (averaged across years of interview). We construct the other eight-year age window exposures starting from the range of the impressionable years. For the subset of individuals who are either too young or too old, we use all available years over the 8-year formative age window. Results are robust to dropping these individuals. We also test for the robustness of the main results using alternative definitions of formative age (Table D2), alternative exposure measures that are de-meaned and de-trended (Table D3), and using four-year age windows to construct exposures in Figure D2.

Figure A2: EPS average exposure density distribution



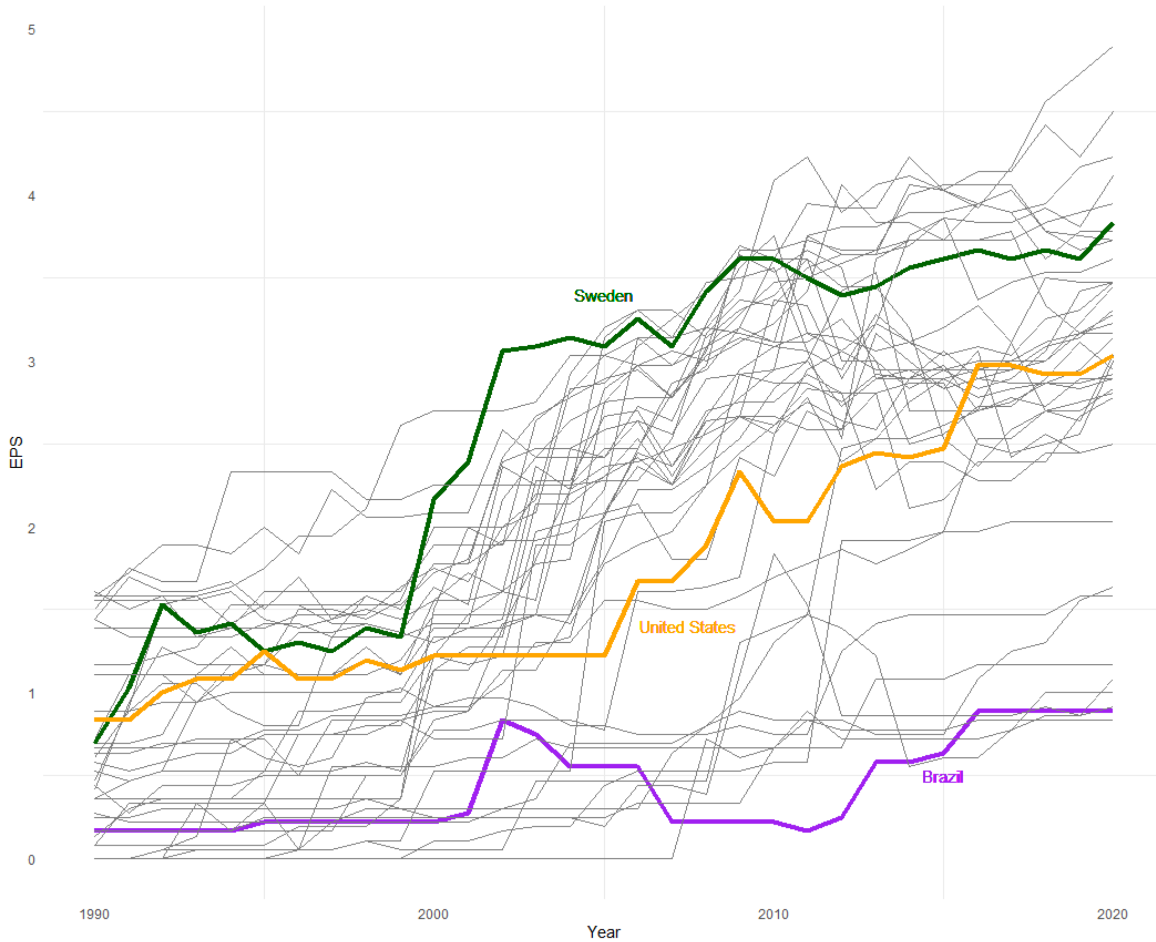
Notes: The figure shows the density distribution of EPS exposure during life in the final estimation sample, with red dot-dashed lines indicating the 25^{th}, 50^{th}, 75^{th} percentile and the blue dashed line indicating the mean.

Figure A3: Country-specific EPS exposure by birth cohort



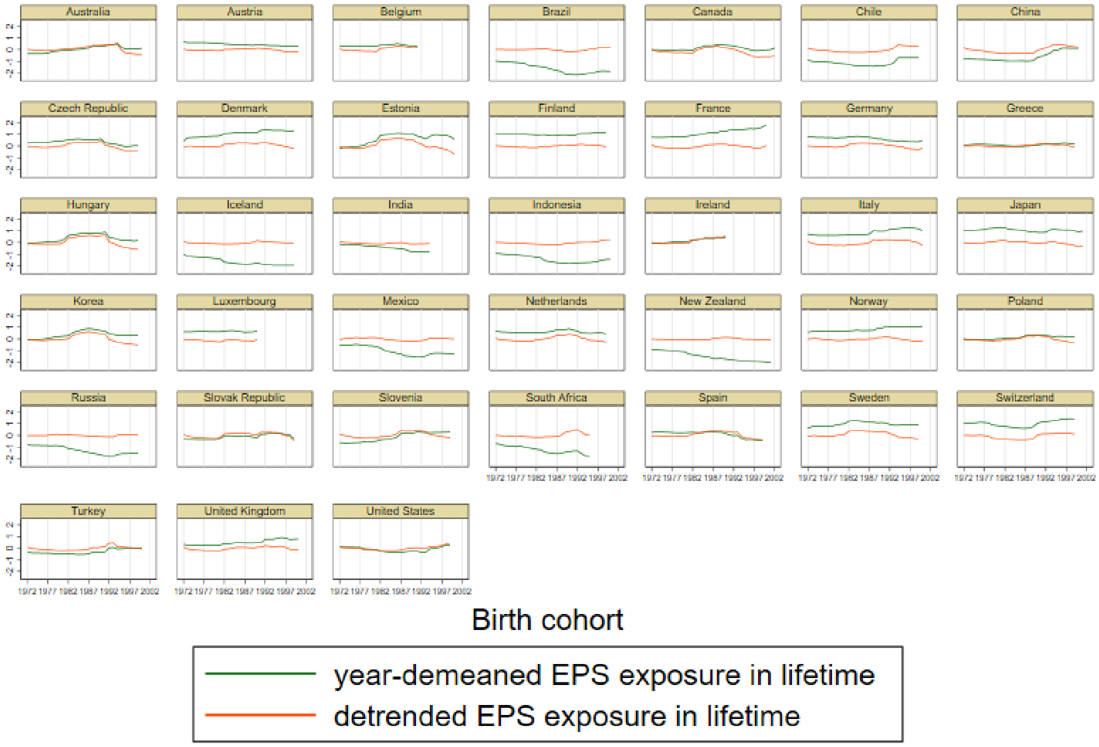
Notes: The figure shows the time series of adulthood mean EPS exposure by cohort for each country over the 30 years available.

Figure A4: Country-specific EPS time series



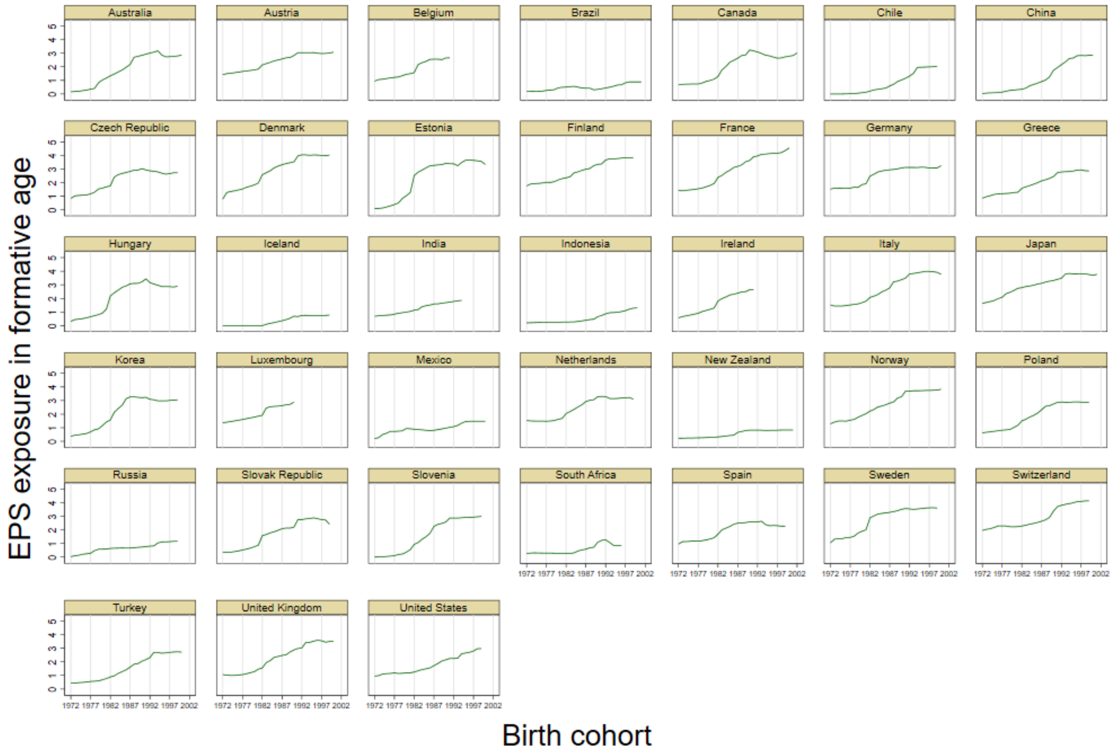
Notes: The figure shows the time series of EPS in each country over time.

Figure A5: Country-specific relative EPS exposure in adult life by birth cohort



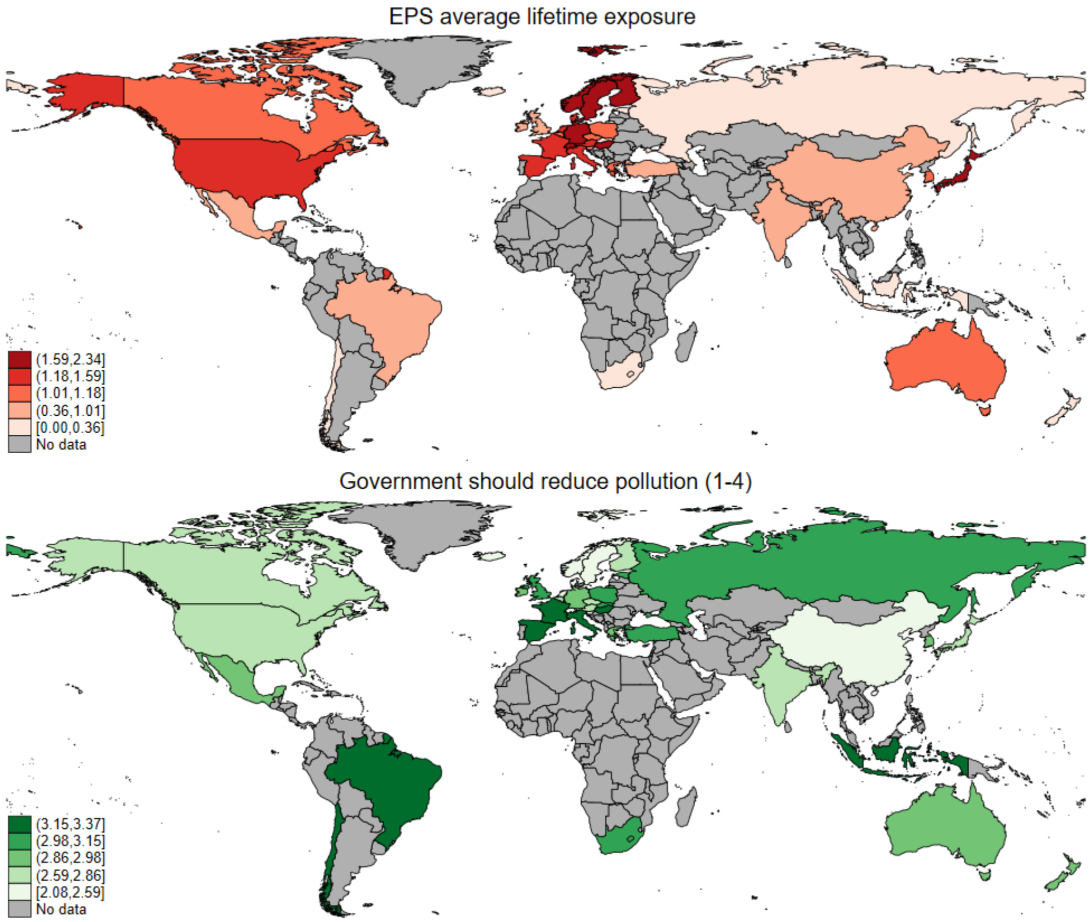
Notes: The figure shows the time series of adulthood mean year-demeaned (in green) and detrended (in red) EPS exposure by cohort for each country over the 30 years available.

Figure A6: EPS exposure in formative age (18-25) by country across birth cohorts



Notes: The figure shows the average EPS exposure across birth cohorts in each country in the IVS sample. Since EPS data are available from 1990 onwards, the oldest birth cohort is those who were born in 1972.

Figure A7: Country pooled average of EPS average exposure across cohorts in baseline sample



Notes: The world map shows the pooled country mean in the final estimation sample of EPS average exposure.

A.3 Environmental Quality

We measure environmental quality using the Environmental Performance Index (EPI) (Wolf et al., 2022), a comprehensive index of global sustainability which combines 40 performance indicators categorized into 11 issues to assess the performance in environmental quality issues. These issues encompass climate change performance, environmental health, and ecosystem vitality, offering a comprehensive overview of a nation's environmental policies and practices. The indicators serve as benchmarks, measuring how closely countries align with established environmental targets and providing insight into areas for improvement to advance sustainability efforts worldwide.

The EPI employs a diverse set of indicators across various issue categories to assess environmental performance comprehensively. The issue categories include climate change mitigation, air quality, sanitation and drinking water, heavy metals, waste management, biodiversity and habitat, ecosystem service, For instance, in the climate change category, indicators such as projected greenhouse gas emissions in 2050, GHG emissions per capita, and CO2 growth rate are evaluated, with each indicator weighted according to its significance. In the environmental health category (HLT), air quality indicators including PM2.5 exposure and household solid fuels are given substantial weight, reflecting the critical importance of addressing air pollution for public health.

The EPI utilizes a weighted scoring system to reflect the relative importance of each issue category and indicator. For example, in the climate change category, mitigation efforts (CCH) hold the highest weight (36.3%), with indicators such as projected GHG emissions and CO2 growth rate receiving significant emphasis. In contrast, household air pollution (HAD) and PM2.5 exposure (PM2.5 or PMD) are weighted at 38% and 47%, respectively, within the air quality subcategory of environmental health (HLT), underscoring their significance in assessing environmental health risks.

In our empirical analysis, we focus on two of the most salient indicators of environmental quality and that can be directly related to air pollution issues as in the World Value Survey questions. We consider household air pollution from solid fuels (HAP) and ambient particulate matter pollution (PMD). HAP is measured by the number of age-standardized disability-adjusted life-years lost per 100,000 persons due to exposure to household air pollution from solid fuels. Similarly, PMD exposure is quantified by the number of age-standardized disability-adjusted life-years lost per 100,000 persons due to exposure to fine particulate matter smaller than 2.5 micrometers (). These indicators provide crucial insights into the health impacts of air pollution, informing environmental health policies and interventions. Throughout the empirical analysis, we construct a measure of environmental quality exposure such that higher values indicate higher quality.

A.4 Descriptive Statistics

Table A1 reports the descriptive statistics for the main variables in the final baseline estimation sample. Environmental Quality exposure measures are expressed in terms of the average number of age-standardized disability-adjusted life-years lost per 100,000 people, and in the estimation sample the measures of environmental quality are transformed for ease of interpretation such that higher values are associated with better environmental conditions (and rescaled as a measure of number of life-years lost per 100 million people). Recession exposure takes value one if the national GDP growth rate dropped by at least 10% during the adult years of the individual (Barro & Ursúa, 2008). We use GDP data from the World Bank - World Development Indicators to compute GDP growth.

Table A1: Summary statistics

	N	mean	SD	min	max
Government should reduce environmental pollution	16889	2.909	0.896	1	4
Environmental Policy Stringency Exposure					
EPS	16889	0.977	0.696	0	3.639
Market (MBI)	16889	0.696	0.547	0	4
Non-Market (NMBI)	16889	1.568	1.219	0	5.250
Tax (CO2, NOX, SOX, Diesel)	16889	1.001	0.771	0	4
CO2 Tax + Diesel Tax	16889	1.718	1.168	0	5.038
CO2 (Tax/Cap-and-Trade)	16889	0.238	0.655	0	5
CO2 (Tax/Cap-and-Trade) + Diesel Tax	16889	1.179	0.810	0	4.667
Fuel (Diesel) Tax	16889	3.060	1.862	0	6
Environmental Quality Exposure					
PM2.5	16889	1184.094	679.706	148.837	2302.446
HAP	16889	847.243	1419.208	0.429	7043.224
Recession exposure	16889	0.010	0.037	0.000	0.286
Number of countries	38				

Notes: Summary statistics are computed using the final estimation sample and observations are weighted by survey weights.

B Environmental preferences and subsequent policies

One of our primary results is the positive effect of past policy exposure on subsequent environmental preferences. This result, when combined with evidence of the effect of preferences on subsequent policy, can be interpreted as a case of positive endogeneity of environmental preferences, which has been previously documented in the case of democratic values and institutions (Acemoglu et al., 2024; Besley & Persson, 2019; Fuchs-Schündeln & Schündeln, 2015).

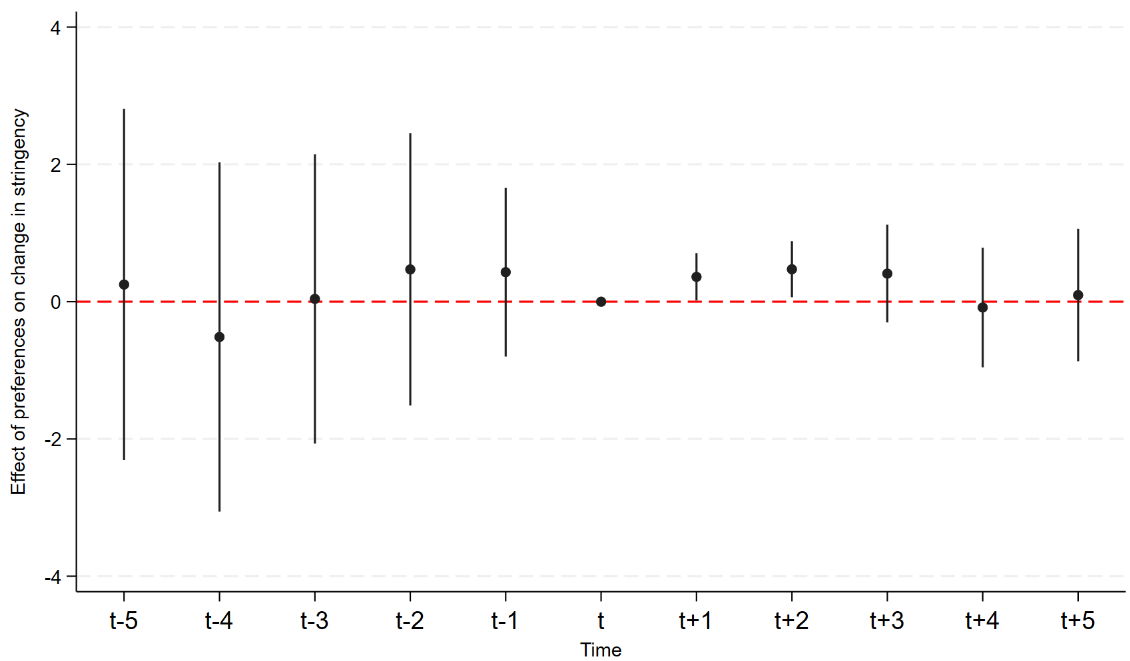
We confirm the effect of preferences on policy outcomes in our setting, the relatively uncontroversial of the bidirectional relationship that we study in our paper. This exercises also has the added benefit of confirming that our survey measures of environmental preferences are meaningfully related to economically relevant policy outcomes. We test for the association between them at the country level. We regress the change in EPS in country c in year t on the weighted-average environmental preferences at the country level recorded at time t, estimating the following equation

$$\begin{aligned}(EPS_{c\tau} - EPS_{ct}) =& \beta_\tau preferences_{ct} + \alpha_c + \mu_t + \varepsilon_{ct} \\ & \forall \tau \in \{-5, -4, .., -1, 1, ..5\}\end{aligned} \tag{B.9}$$

In doing so, for each regression we estimate using Equation (B.9), we obtain a coefficient β_τ to see if our main survey question predicts policy levels in the near future. Figure B1 plots the β_τ's coefficients obtained. We find that our primary survey measure of environmental policy preferences significantly predicts subsequent changes to environmental stringency for up to two years following the year of survey t. As a placebo test, we also estimate the association between preferences and past policy deviations from contemporaneous policy levels (for $\tau < 0$). Reassuringly, there is no statistically significant relationship between the survey measure and changes to policy stringency levels in any of the five prior years to the survey.

This exercise allays concerns on the relevance of our environmental preferences and policy measures. Moreover, these results do not affect the internal validity of our approach for two main reasons. First, we consider simultaneous changes between preferences on policy deviations. Our baseline empirical approach focuses on changes in past policy exposure and the effect on subsequent long-lasting policy preferences measured at the time of the survey. Second, to the extent that past policy preferences may still be a confound to the effect of past policy stringency on subsequent preferences, our results are robust to controlling for aggregate country-level preferences during each individual's formative age, as reported in Table D4.

Figure B1: Event-study of environmental survey preferences on changes in policy stringency levels



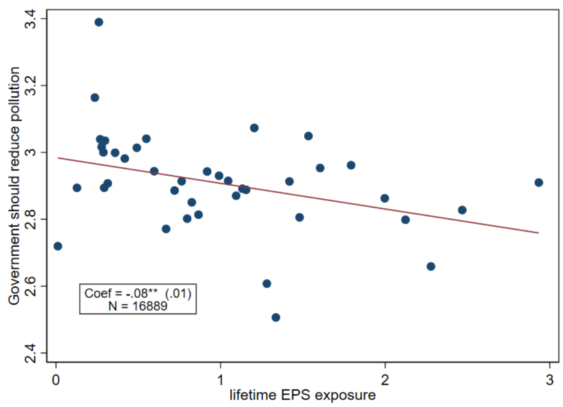
Notes: The figure reports the coefficients associated with environmental preferences on changes in environmental policy stringency. Each coefficient is obtained from a regression of environmental preferences on a lag/lead of changes in policy stringency with respect to the level of policy stringency contemporaneous to the year of the survey. Environmental preferences are measured as the country-average level of agreement with the question "Government should reduce pollution" on a scale from 1 to 4. The regression also controls for country and year fixed effects. Bins represent the 95% confidence intervals.

C Adulthood Exposure

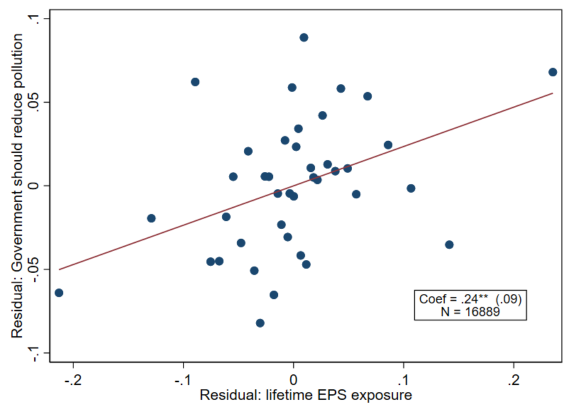
C.1 Additional results

Figure C1: Binned scatter plot of environmental preferences and EPS exposure

(a) Partial correlation

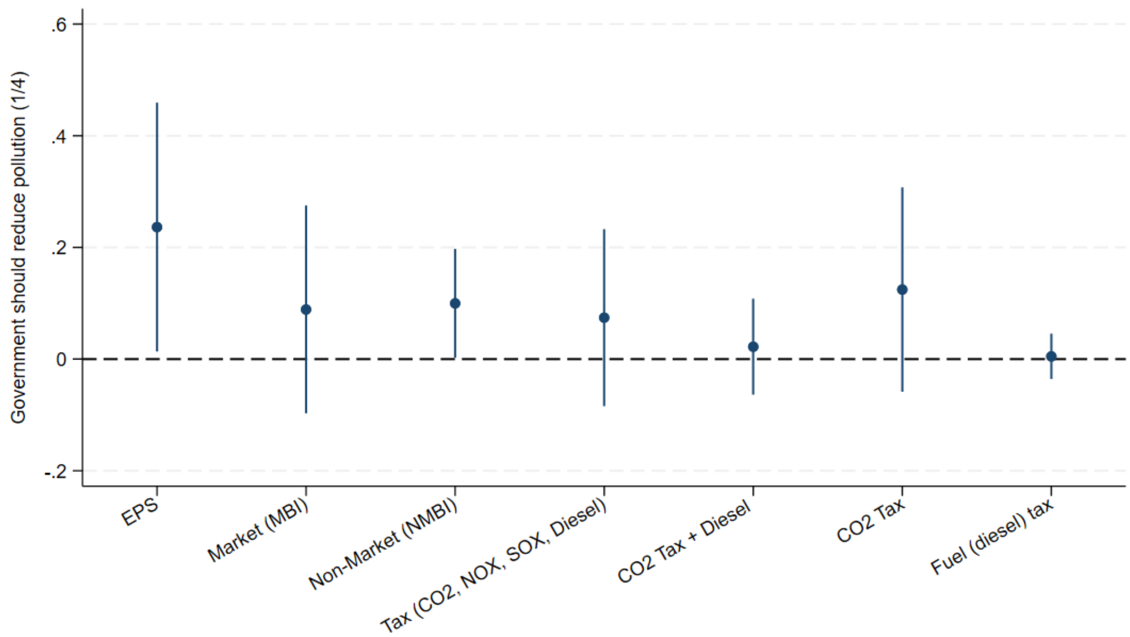


(b) Residualized partial correlation



Notes: The baseline estimation sample is split into 40 equal-sized bins. Panel (a) shows the raw partial correlation of each mean of that bin between EPS exposure and the government's role in reducing pollution. In Panel (b) each data point shows the mean residual of that bin after controlling for year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted by the survey weights.

Figure C2: Effect of EPS sub-indices exposure in adulthood on government's role to reduce pollution



Notes: The figure shows the coefficient associated with the average level of sub-index in the x-axis during the adulthood of an individual, using as outcome the question "Government should reduce pollution" in the Likert scale. All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure, PM2.5 and HAP exposure. The regression also includes year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 95% confidence intervals around point estimates. Tabular results are reported in Appendix Table C8.

Table C1: Environmental Policy Stringency (EPS) exposure during adult life (with controls' estimates)

	Government should reduce pollution (Likert)				
	(1)	(2)	(3)	(4)	(5)
Environmental Policy Stringency (EPS) exposure	0.228**	0.225**	0.219**	0.228**	0.236**
	(0.109)	(0.110)	(0.107)	(0.109)	(0.111)
Recession exposure		-0.515	-0.528	-0.534	-0.518
		(0.381)	(0.406)	(0.378)	(0.392)
PM2.5 exposure			0.314*		0.354**
			(0.186)		(0.173)
HAP exposure				-0.198***	-0.221**
				(0.0713)	(0.0905)
Male	0.0268	0.0267	0.0267	0.0269	0.0269
	(0.0183)	(0.0183)	(0.0183)	(0.0183)	(0.0183)
Education: Reference category: Lower education					
Middle	-0.0716**	-0.0718**	-0.0718**	-0.0718**	-0.0718**
	(0.0307)	(0.0307)	(0.0307)	(0.0307)	(0.0307)
Upper	-0.243***	-0.243***	-0.243***	-0.243***	-0.243***
	(0.0433)	(0.0433)	(0.0433)	(0.0433)	(0.0433)
Unemployed	0.0660***	0.0661***	0.0660***	0.0656***	0.0656***
	(0.0221)	(0.0221)	(0.0221)	(0.0221)	(0.0221)
Income deciles: Reference category: Bottom decile					
2nd	-0.00528	-0.00519	-0.00521	-0.00526	-0.00524
	(0.0361)	(0.0362)	(0.0362)	(0.0363)	(0.0363)
3rd	-0.0444	-0.0443	-0.0443	-0.0441	-0.0441
	(0.0391)	(0.0391)	(0.0391)	(0.0392)	(0.0392)
4th	-0.0779**	-0.0779**	-0.0779**	-0.0776**	-0.0775**
	(0.0339)	(0.0338)	(0.0339)	(0.0339)	(0.0339)
5th	-0.0277	-0.0281	-0.0281	-0.0279	-0.0278
	(0.0321)	(0.0321)	(0.0321)	(0.0322)	(0.0322)
6th	-0.0415	-0.0418	-0.0418	-0.0414	-0.0414
	(0.0392)	(0.0392)	(0.0392)	(0.0393)	(0.0393)
7th	-0.0853**	-0.0857**	-0.0857**	-0.0854**	-0.0853**
	(0.0401)	(0.0400)	(0.0400)	(0.0401)	(0.0401)
8th	-0.0671*	-0.0671*	-0.0671*	-0.0668*	-0.0667*
	(0.0385)	(0.0385)	(0.0385)	(0.0386)	(0.0386)
9th	-0.151***	-0.152***	-0.152***	-0.152***	-0.152***
	(0.0553)	(0.0553)	(0.0553)	(0.0554)	(0.0554)
10th	-0.0983*	-0.0990*	-0.0991*	-0.0987*	-0.0985*
	(0.0555)	(0.0555)	(0.0554)	(0.0555)	(0.0555)
Survey FE	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓
Mean outcome	2.909	2.909	2.909	2.909	2.909
SD Outcome	0.896	0.896	0.896	0.896	0.896
N	16889	16889	16889	16889	16889
adj. R^2	0.132	0.132	0.132	0.132	0.132

Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during the formative age the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are inverted such that higher values imply higher quality and divided by 1000 to improve readability of coefficients). All regressions also include year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

C.2 Robustness

We find coefficients quantitatively very similar to our baseline with alternative measures of policy stringency de-meaned from the annual cross-sectional average and de-trended from a country-specific linear trend (Appendix Table C2). We examine the influence of starting age, and find that the effect becomes more robust from age 16 across all policy exposure measures, including demeaned and detrended (Appendix Table C3). This result supports our hypothesized channel of norm formation, which requires awareness of and influence by policy stringency, and becomes likelier approaching adulthood.[15]

We also adopt alternative estimation methods, using ordered probit (Appendix Table C4), probit and linear probability models for binary outcomes (Appendix Tables C5 and C6). Results remain quantitatively comparable. In the latter exercise, increasing stringency exposure from the US level to Sweden's level in 2019 increases the probability by 5 percentage points (7.5% at the mean) of expressing that government should reduce pollution and of strongly agreeing by 9.4 p.p. (31%). Results are also robust to alternative fixed effects (Appendix Table C7) and to "leave-one-country-out" (Appendix Figure C3).

[15]Differently than exposure to democratic institutions which are assumed to be understood by individuals as of age of six (Acemoglu et al., 2024), environmental policies and their effects are posited to be internalized from adult life (Aklin et al., 2013).

Table C2: EPS exposure with relative measure (starting from 18 years)

	Government should reduce pollution (Likert)			
	(1)	(2)	(3)	(4)
Panel A: Year-demeaned relative exposure				
EPS average exposure	0.190*	0.182*	0.190*	0.194*
	(0.109)	(0.106)	(0.107)	(0.109)
Panel B: Country-detrended exposure				
EPS average exposure	0.220*	0.214**	0.224**	0.231**
	(0.110)	(0.107)	(0.109)	(0.111)
Recession exposure	✓	✓	✓	✓
PM2.5 exposure		✓		✓
HAP exposure			✓	✓
Individual controls	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓

Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are divided by 1000 to improve readability of coefficients). All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C3: EPS exposure in adult life with different starting ages

	Government should reduce pollution			
	(1)	(2)	(3)	(4)
Panel A: Baseline exposure measure				
EPS average exposure	0.226	0.367	0.345*	0.398***
	(0.349)	(0.240)	(0.185)	(0.140)
Panel B: Year-demeaned relative exposure				
EPS average exposure	0.263	0.467**	0.331*	0.400**
	(0.324)	(0.224)	(0.187)	(0.152)
Panel C: Country-detrended exposure				
EPS average exposure	0.201	0.353	0.335*	0.390***
	(0.351)	(0.241)	(0.184)	(0.141)
Starting age	14 years	15 years	16 years	17 years
Recession exposure	✓	✓	✓	✓
EQ exposure	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓
N	11730	13129	14449	15605

Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are divided by 1000 to improve readability of coefficients). All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C4: Ordered Probit: EPS average exposure during adulthood

	Government should reduce pollution (Likert)			
	(1)	(2)	(3)	(4)
Environmental Policy Stringency (EPS) exposure	0.129*	0.130*	0.130*	0.355**
	(0.0703)	(0.0704)	(0.0676)	(0.157)
Recession exposure	0.00229	-0.00384	-0.0186	-0.00549
	(0.0565)	(0.0574)	(0.0557)	(0.0514)
PM2.5 exposure		-0.0838		0.564**
		(0.158)		(0.275)
HAP exposure			0.201***	-0.203**
			(0.0494)	(0.0942)
Individual controls	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓
Mean Outcome	2.923	2.923	2.923	2.923
SD Outcome	0.90	0.90	0.90	0.90
N	16889	16889	16889	16889

Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are divided by 1000 to improve readability of coefficients). All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C5: Environmental Policy Stringency (EPS) exposure with binary outcomes. Probit estimates.

	Government should reduce pollution			
	(1)	(2)	(3)	(4)
Panel A: Agree & Strongly Agree				
EPS exposure	0.265*	0.191	0.275*	0.221
	(0.145)	(0.141)	(0.141)	(0.143)
Recession exposure	0.000541	-0.0105	-0.00919	-0.0142
	(0.0666)	(0.0728)	(0.0684)	(0.0720)
PM2.5 exposure		-1.186**		-0.824
		(0.579)		(0.536)
HAP exposure			-0.983*	-0.714
			(0.524)	(0.530)
EPS Marginal effect	0.095*	0.068	0.098**	0.079
	(0.052)	(0.050)	(0.050)	(0.050)
Mean outcome	0.67	0.67	0.67	0.67
SD Outcome	0.47	0.47	0.47	0.47
Panel B: Strongly Agree				
EPS exposure	0.368**	0.434**	0.366**	0.447**
	(0.181)	(0.182)	(0.184)	(0.190)
Recession exposure	-0.0316	-0.0227	-0.0303	-0.0227
	(0.0635)	(0.0602)	(0.0621)	(0.0609)
PM2.5 exposure		0.990**		1.143*
		(0.504)		(0.647)
HAP exposure			0.213	-0.238
			(0.452)	(0.470)
EPS Marginal effect	0.125**	0.147**	0.124**	0.152**
	(0.061)	(0.062)	(0.062)	(0.065)
Mean outcome	0.30	0.30	0.30	0.30
SD Outcome	0.46	0.46	0.46	0.46
N	16889	16889	16889	16889

Notes: All regressions are estimated using a Probit model and control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are divided by 1000 to improve readability of coefficients). All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C6: Environmental Policy Stringency (EPS) exposure with binary outcomes. OLS estimates.

	Government should reduce pollution			
	(1)	(2)	(3)	(4)
Panel A: Agree & Strongly Agree				
Environmental Policy Stringency (EPS) exposure	0.0862*	0.0634	0.0895**	0.0718
	(0.0441)	(0.0431)	(0.0429)	(0.0438)
Recession exposure	0.00137	-0.00180	-0.000247	-0.00203
	(0.0202)	(0.0219)	(0.0206)	(0.0217)
PM2.5 exposure		-0.355*		-0.259
		(0.178)		(0.173)
HAP exposure			-0.265*	-0.179
			(0.154)	(0.158)
Mean outcome	0.67	0.67	0.67	0.67
SD Outcome	0.47	0.47	0.47	0.47
Panel B: Strongly Agree				
Environmental Policy Stringency (EPS) exposure	0.113*	0.132**	0.112*	0.134**
	(0.0573)	(0.0577)	(0.0584)	(0.0596)
Recession exposure	-0.00756	-0.00490	-0.00708	-0.00493
	(0.0217)	(0.0208)	(0.0213)	(0.0209)
PM2.5 exposure		0.298*		0.310
		(0.174)		(0.193)
HAP exposure			0.0797	-0.0232
			(0.151)	(0.142)
Mean outcome	0.30	0.30	0.30	0.30
SD Outcome	0.46	0.46	0.46	0.46
N	16889	16889	16889	16889

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are divided by 1000 to improve readability of coefficients). All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C7: Environmental Policy Stringency (EPS) exposure and environmental preferences. Alternative specifications.

	Government should reduce pollution (Likert)				
	(1)	(2)	(3)	(4)	(5)
Environmental Policy Stringency (EPS) exposure	0.227**	0.181**	0.175**	0.127**	0.124**
	(0.108)	(0.0898)	(0.0860)	(0.0527)	(0.0521)
Recession	✓	✓	✓	✓	✓
EQ controls	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓
Age FE		✓		✓	
Continent × Age FE			✓		✓
Continent-age linear trends				✓	✓
Mean Outcome	2.909	2.909	2.909	2.909	2.909
SD Outcome	0.896	0.896	0.896	0.896	0.896
N	16889	16889	16889	16889	16889
adj. R^2	0.132	0.133	0.134	0.132	0.133

Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure and PM2.5 and HAP exposure. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C8: Exposure to EPS sub-indices during adulthood on government intervention preferences

	Government should reduce pollution (Likert)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Policy exposure	0.236**	0.0889	0.0998**	0.0742	0.125	0.00492	0.00889
	(0.111)	(0.0930)	(0.0487)	(0.0791)	(0.0914)	(0.0202)	(0.0650)
Policy	EPS	Market	Non-Market	Tax	CO2+Diesel	CO2	Diesel
Recession exposure	✓	✓	✓	✓	✓	✓	✓
Environmental Quality exposure	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓	✓
Mean Outcome	2.909	2.909	2.909	2.909	2.909	2.909	2.909
SD Outcome	0.896	0.896	0.896	0.896	0.896	0.896	0.896
Mean Exposure	0.977	0.696	1.568	1.001	1.718	0.377	3.060
SD Exposure	0.696	0.547	1.219	0.771	1.168	1.202	1.862
N	16889	16889	16889	16889	16889	16889	16889
adj. R^2	0.132	0.132	0.132	0.132	0.132	0.132	0.132

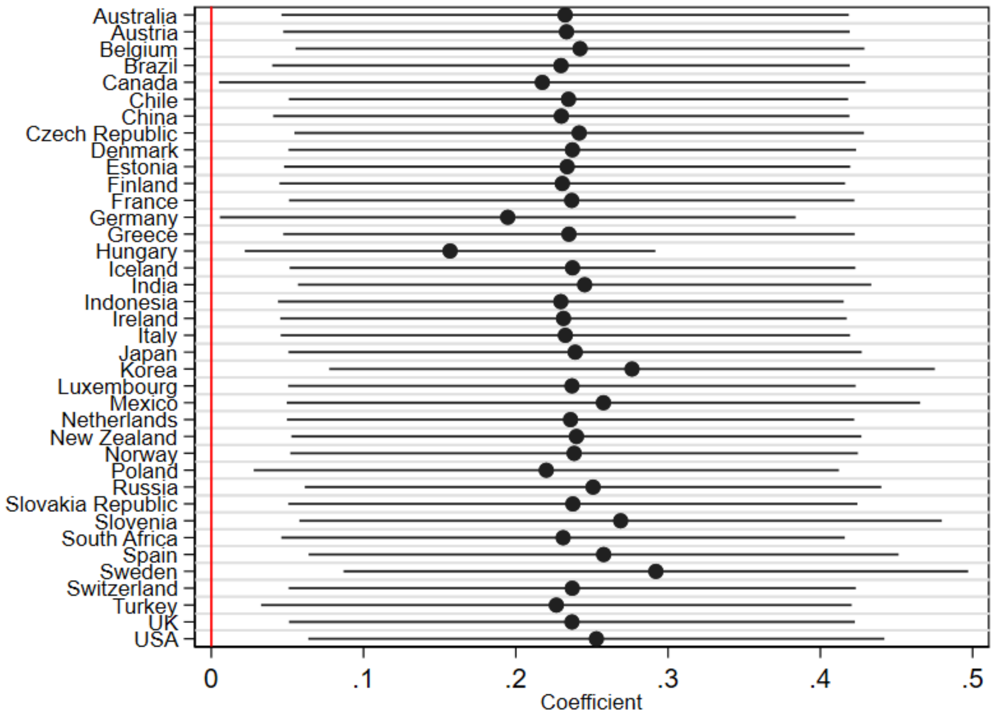
Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. Environmental Quality exposure are PM2.5 and HAP exposure, respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C9: Exposure to EPS sub-indices during adulthood on tax increase preferences

	Increase in tax if used to prevent pollution						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Likert							
Policy exposure	-0.0875	0.118	-0.0495	0.133**	0.127***	0.131*	0.0596**
	(0.107)	(0.106)	(0.0494)	(0.0611)	(0.0428)	(0.0747)	(0.0226)
Mean Outcome	2.587	2.587	2.587	2.587	2.587	2.587	2.587
SD Outcome	0.859	0.859	0.859	0.859	0.859	0.859	0.859
Panel B: Binary (Agree & Strongly Agree)							
Policy exposure	-0.0474	0.0968**	-0.0274	0.0828**	0.0794***	0.0904**	0.0368***
	(0.0520)	(0.0482)	(0.0247)	(0.0325)	(0.0237)	(0.0388)	(0.0129)
Mean Outcome	0.581	0.581	0.581	0.581	0.581	0.581	0.581
SD Outcome	0.493	0.493	0.493	0.493	0.493	0.493	0.493
Panel C: Binary (Strongly Agree)							
Policy exposure	-0.00174	-0.0139	0.00483	0.0136	0.0282	0.0111	0.0144
	(0.0342)	(0.0453)	(0.0154)	(0.0278)	(0.0187)	(0.0387)	(0.00995)
Mean Outcome	0.133	0.133	0.133	0.133	0.133	0.133	0.133
SD Outcome	0.339	0.339	0.339	0.339	0.339	0.339	0.339
Policy	EPS	Market	Non-Market	Tax	CO2+Diesel	CO2	Diesel
Recession exposure	✓	✓	✓	✓	✓	✓	✓
Environmental Quality exposure	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓	✓
Mean Exposure	0.914	0.671	1.443	0.971	1.683	0.374	2.991
SD Exposure	0.689	0.545	1.206	0.776	1.202	1.217	1.918
N	20480	20480	20480	20480	20480	20480	20480
adj. R^2	0.090	0.090	0.090	0.090	0.090	0.090	0.090

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. Environmental Quality exposure are PM2.5 and HAP exposure, respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure C3: EPS exposure - leave-one-country-out



Notes: We plot the marginal effect of EPS exposure in adulthood in 38 different regressions where we exclude each time a different country as reported in the y-axis. The regression controls for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure, PM2.5 and HAP exposure. The regression also includes year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 90% confidence intervals around point estimates.

C.3 Falsification Test

We conduct a falsification test to ensure that the effect of environmental policy exposure does not simply conflate changes in broader social and political attitudes and only affects environmental preferences. We use 13 alternative outcomes (detailed in Table C10) and regress each of these on our main measure of environmental policy stringency. In Table C11, we find no effect that is statistically distinguishable from zero, except for one at the 5% level, consistent with sampling variation attributable to multiple tests. This result allays concerns on general social and political changes conflating changes in environmental preferences.[16]

[16]We also note that another ideal placebo exercise would test the cross-cohort parallel trends underlying assumption (Acemoglu et al., 2024) by regressing pre-birth "exposure" to environmental policy stringency. Unfortunately, the short time series of EPS data starting in 1990 does not allow us to characterize pre-birth exposure in our estimation sample

Table C10: Description of other values used as outcomes in the falsification exercise

Variable	Description	Categories
A025	Respect and love for parents	1 = Respect if earned 2 = Neither 3 = Always respect
A026	Parents responsibilities to their children	1 = Parents have a life of their own and should not be asked to sacrifice their own well-being for the sake of their children 2 = Neither 3 = Parents' duty is to do their best for their children even at the expense of their own well-being
A048	Abortion when woman not married	0 = Disapprove 1 = Approve
A049	Abortion if not wanting more children	0 = Disapprove 1 = Approve
A165	Most people can be trusted	0 = Can´t be too careful 1 = Most people can be trusted
C001	Jobs scarce: Men should have more right to a job than women	1 = Disagree 2 = Neither 3 = Agree
C002	Jobs scarce: Employers should give priority to (nation) people than immigrants	1 = Disagree 2 = Neither 3 = Agree
C036	To develop talents you need to have a job	1 = Strongly agree 2 = Agree 3 = Neither agree nor disagree 4 = Disagree 5 = Strongly disagree
C037	Humiliating to receive money without having to work for it	1 = Strongly agree 2 = Agree 3 = Neither agree nor disagree 4 = Disagree 5 = Strongly disagree
C038	People who don´t work turn lazy	1 = Strongly agree 2 = Agree 3 = Neither agree nor disagree 4 = Disagree 5 = Strongly disagree
C039	Work is a duty towards society	1 = Strongly agree 2 = Agree 3 = Neither agree nor disagree 4 = Disagree 5 = Strongly disagree
D018	Child needs a home with father and mother	0 = Tend to disagree 1 = Tend to agree
E124	Respect for individual human rights nowadays	1 = There is a lot of respect for individual human rights 2 = There is some respect 3 = There is not much respect 4 = There is no respect at all

Table C11: Placebo test using other outcomes

	(1) A025	(2) A026	(3) A048	(4) A049	(5) A165	(6) C001	(7) C002	(8) C036	(9) C037	(10) C038	(11) C039	(12) D018	(13) E124
EPS exposure	0.0853	0.0505	0.0839	0.0173	-0.000162	0.0495**	0.0356	-0.0455	0.0602	-0.0216	0.000166	-0.0112	-0.0283
	(0.107)	(0.0977)	(0.0805)	(0.0712)	(0.0169)	(0.0249)	(0.0342)	(0.0545)	(0.0621)	(0.0588)	(0.0407)	(0.0273)	(0.0273)
Recession exposure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EQ exposure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mean Outcome	2.404	2.451	0.569	0.550	0.325	1.616	2.332	2.204	2.714	2.384	2.368	0.797	2.294
SD Outcome	0.915	0.851	0.495	0.497	0.468	0.841	0.864	1.093	1.194	1.143	1.048	0.402	0.821
N	21602	21803	12514	12744	69889	71638	71332	38440	38276	50954	50862	31194	44904
adj. R^2	0.158	0.083	0.129	0.137	0.187	0.276	0.169	0.127	0.088	0.108	0.070	0.157	0.160

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also include year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

C.4 Heterogeneity

Table C12: Environmental Policy Stringency and Individual Preferences for Government Intervention: Heterogeneous Effects

	Government should reduce pollution (Likert)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EPS exposure	0.263**	0.276**	0.326***	0.274**	0.277**	0.225**	0.210**
	(0.114)	(0.116)	(0.118)	(0.115)	(0.116)	(0.104)	(0.103)
Uninteracted Term 1	0.00127	0.0625**	-0.0387	0.0859	-0.0775	0.0567	-0.0883
	(0.0310)	(0.0303)	(0.0479)	(0.0647)	(0.0761)	(0.0443)	(0.0765)
Uninteracted Term 2			-0.110*				
			(0.0634)				
Interaction Term 1	0.0260	0.00406	-0.0380	0.0111	-0.0201	0.00451	0.0968
	(0.0249)	(0.0325)	(0.0362)	(0.0384)	(0.0611)	(0.0456)	(0.0597)
Interaction Term 2			-0.138***				
			(0.0467)				
Interaction Term	Male (=1)	Unemployed (=1)	Education (Middle=1; Upper=2)	Poor (=1)	Rich (=1)	Left-wing (=1)	Right-wing (=1)
Recession exposure controls	✓	✓	✓	✓	✓	✓	✓
EQ exposure controls	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓	✓
Mean Outcome	2.922	2.922	2.922	2.922	2.922	2.915	2.915
SD Outcome	0.900	0.900	0.900	0.900	0.900	0.900	0.900
N	16889	16889	16889	16889	16889	13719	13719
adj. R^2	0.132	0.132	0.133	0.132	0.132	0.121	0.121

Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are inverted such that higher values imply higher quality). Poor is a dummy variable equal to one if individuals report belonging to the first two lowest deciles of the income scale, and zero otherwise. Rich is a dummy variable equal to one if individuals report belonging to the first two highest deciles of the income scale, and zero otherwise. Left-wing is a dummy variable equal to one if individuals report belonging to the first two steps in a ten-point political scale that goes from one (Left) to ten (Right). Right-wing is a dummy variable equal to one if individuals report belonging to the last two steps in a ten-point political scale that goes from one (Left) to ten (Right). All regressions also include year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C13: Environmental Policy Stringency and Individual Preferences for Government Action: Heterogeneous Effects

	Government should reduce pollution (Likert)			
	(1)	(2)	(3)	(4)
EPS exposure	-0.0126	-0.00539	0.197*	0.220*
	(0.0852)	(0.113)	(0.113)	(0.112)
Interest in politics				
Somewhat interested	0.0204			
	(0.0519)			
Not very interested	0.0486			
	(0.0522)			
Not at all interested	0.0312			
	(0.0494)			
Somewhat interested× EPS exposure	0.0788*			
	(0.0398)			
Not very interested × EPS exposure	0.121**			
	(0.0465)			
Not at all interested× EPS exposure	0.220***			
	(0.0533)			
Confidence: The Government (Baseline: A great deal)				
Quite a lot		0.0440		
		(0.0653)		
Not very much		0.0201		
		(0.0724)		
None at all		0.0270		
		(0.0815)		
Quite a lot × EPS exposure		0.0208		
		(0.0605)		
Not very much × EPS exposure		0.0610		
		(0.0780)		
None at all × EPS exposure		0.187**		
		(0.0761)		
Government vs People Responsibility				
Government responsibility			0.0722**	
			(0.0347)	
Government responsibility × EPS exposure			0.0674**	
			(0.0323)	
People responsibility				-0.0529
				(0.0620)
People responsibility × EPS exposure				0.0586
				(0.0501)
Recession exposure	✓	✓	✓	✓
EQ exposure	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓
Mean Outcome	2.926	2.950	2.922	2.922
SD Outcome	0.896	0.892	0.900	0.900
N	15414	12102	16646	16646
adj. R^2	0.132	0.120	0.136	0.132

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. All regressions control for survey, country-year of interview, year of birth FE. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

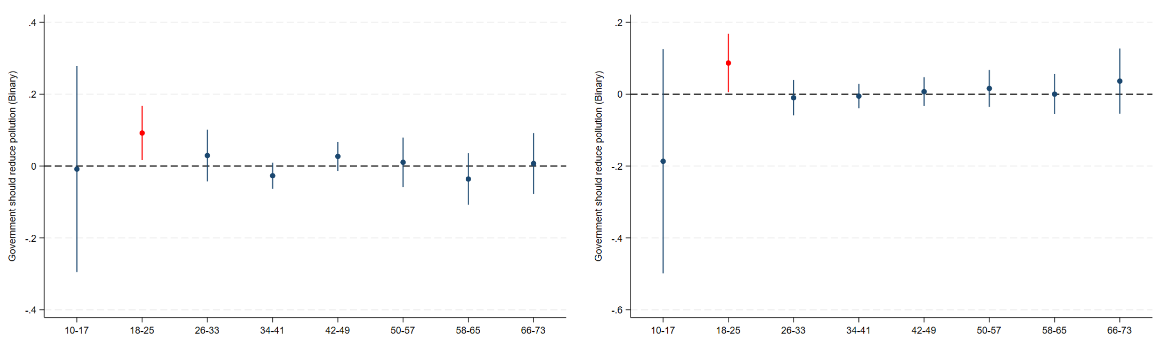
D Additional results for formative age

In this Section, we test for the robustness of the baseline results in Section 5.2. Results are robust to the use of binary versions of the outcome (Appendix Figure D1), alternative definitions of formative age (Appendix Table D2), de-meaned and detrended exposure measures (Appendix Table D3), and measuring exposure over four-year age windows (Appendix Figure D2). In Section D.2, we describe an additional robustness test in which we account for country-level formative-age preferences as a measure of a second-order beliefs channel.

D.1 Robustness

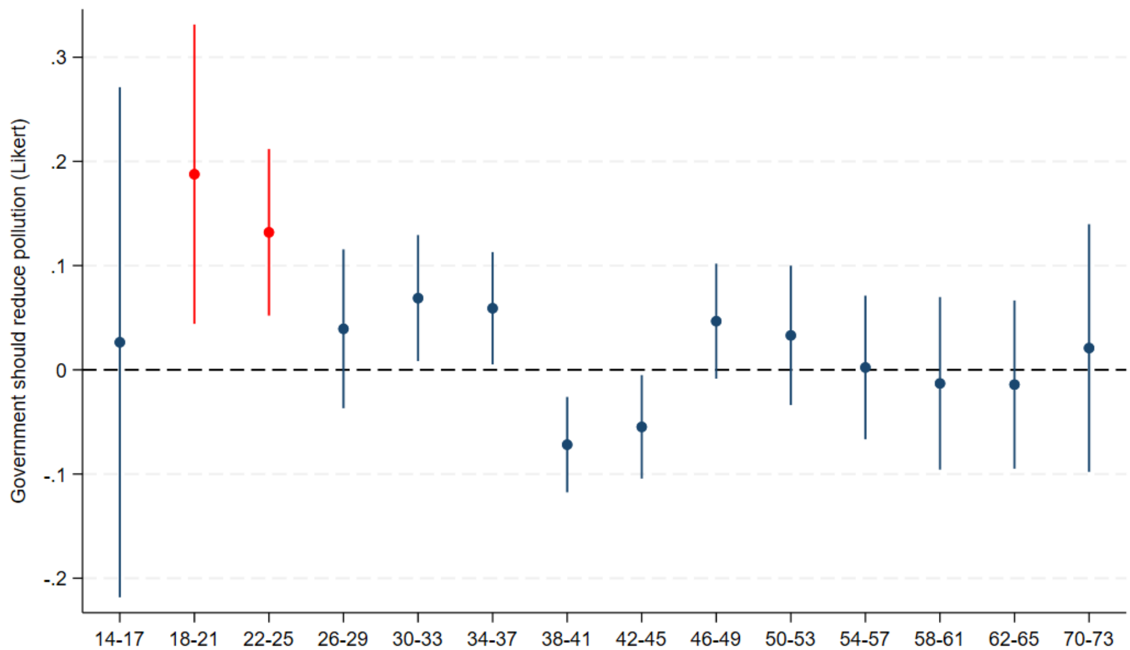
Figure D1: Effect of EPS exposure in other age windows using binary outcomes

(a) Agree & Strongly Agree (b) Strongly Agree



Notes: The figure plots the coefficients associated with the average level of EPS during each eight-year age window reported in the x-axis using the question "Government should reduce pollution" as outcome recoded in two different binary versions. In panel (a), the binary variable takes value one if respondents state either agree or strongly agree. In panel (b), the binary takes value one if respondents state strongly agree. The regression controls for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure, PM2.5 and HAP exposure. The regression also includes year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 95% confidence intervals around point estimates. Tabular results are reported in Table D1.

Figure D2: Policy stringency effect on environmental preferences by four-year age window exposure



Notes: The figure plots the coefficients associated with the average level of EPS during each four-year age window reported in the x-axis using the question "Government should reduce pollution" as outcome in Likert scale. The regression controls for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure, PM2.5 and HAP exposure. The regression also includes year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 95% confidence intervals around point estimates.

Table D1: Effect of Environmental Policy Stringency (EPS) exposure by age windows on environmental preferences

	Government should reduce pollution							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Likert								
EPS exposure	-0.243	0.207**	0.0173	-0.0417	0.0509	0.0399	-0.0747	0.0695
	(0.262)	(0.0914)	(0.0698)	(0.0302)	(0.0397)	(0.0539)	(0.0716)	(0.0793)
Age window	10-17	18-25	26-33	34-41	42-49	50-57	58-65	66-73
Mean outcome	2.962	2.912	2.899	2.901	2.879	2.884	2.944	3.000
SD Outcome	0.875	0.896	0.912	0.909	0.906	0.917	0.905	0.888
Panel B: Binary (Agree & Strongly Agree)								
EPS exposure	-0.00840	0.0920**	0.0293	-0.0270	0.0269	0.0105	-0.0361	0.00717
	(0.143)	(0.0377)	(0.0360)	(0.0182)	(0.0201)	(0.0343)	(0.0358)	(0.0423)
Age window	10-17	18-25	26-33	34-41	42-49	50-57	58-65	66-73
Mean outcome	0.698	0.667	0.654	0.654	0.647	0.649	0.679	0.708
SD Outcome	0.459	0.471	0.476	0.476	0.478	0.477	0.467	0.455
Panel C: Binary (Strongly Agree)								
EPS exposure	-0.187	0.0868**	-0.00985	-0.00535	0.00722	0.0161	0.000245	0.0365
	(0.156)	(0.0406)	(0.0246)	(0.0170)	(0.0201)	(0.0256)	(0.0279)	(0.0453)
Age window	10-17	18-25	26-33	34-41	42-49	50-57	58-65	66-73
Mean outcome	0.314	0.303	0.307	0.307	0.295	0.302	0.324	0.342
SD Outcome	0.464	0.460	0.461	0.461	0.456	0.459	0.468	0.475
Recession exposure	✓	✓	✓	✓	✓	✓	✓	✓
EQ exposure	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Country $\times$ Year of interview FE	✓	✓	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓	✓	✓
N	6623	16889	20300	20211	17904	14522	11179	7788

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also include year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table D2: Environmental Policy Stringency (EPS) exposure and environmental preferences. Alternative definitions of formative age.

	Government should reduce pollution (Likert)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPS exposure	0.398	0.398	0.516**	0.287***	0.392*	0.318	0.198**	0.185*
	(0.246)	(0.246)	(0.242)	(0.0901)	(0.198)	(0.200)	(0.0819)	(0.0944)
Formative age	16-23	16-24	16-25	17-23	17-24	17-25	18-23	18-24
Recession exposure	✓	✓	✓	✓	✓	✓	✓	✓
EQ exposure	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Country $\times$ Year of interview FE	✓	✓	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓	✓	✓
Mean Outcome	2.923	2.923	2.921	2.919	2.911	2.916	2.913	2.915
SD Outcome	0.880	0.880	0.881	0.890	0.886	0.884	0.896	0.893
Mean Exposure	0.964	0.964	0.979	0.859	0.982	0.991	0.879	0.885
SD Exposure	0.719	0.719	0.722	0.664	0.717	0.722	0.673	0.681
N	6064	6064	5919	14805	7418	7185	17215	16282
adj. R^2	0.126	0.126	0.127	0.135	0.136	0.132	0.132	0.135

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also include year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table D3: EPS exposure during formative age on environmental preferences

	Government should reduce pollution (Likert)			
	(1)	(2)	(3)	(4)
Panel A: Baseline exposure measure				
EPS average exposure	0.190**	0.190**	0.206**	0.207**
	(0.0887)	(0.0880)	(0.0917)	(0.0914)
Mean Exposure	0.914	0.914	0.914	0.914
SD Exposure	0.681	0.681	0.681	0.681
Panel B: Year-demeaned relative exposure				
EPS average exposure	0.156	0.183*	0.156	0.183*
	(0.0982)	(0.102)	(0.0980)	(0.102)
Mean exposure	-0.230	-0.230	-0.230	-0.230
SD exposure	0.684	0.684	0.684	0.684
Panel C: Country-detrended exposure				
EPS average exposure	0.160*	0.181*	0.166*	0.190*
	(0.0948)	(0.0982)	(0.0952)	(0.0995)
Mean exposure	-0.112	-0.112	-0.112	-0.112
SD exposure	0.230	0.230	0.230	0.230
Recession exposure	✓	✓	✓	✓
PM2.5 exposure		✓		✓
HAP exposure			✓	✓
Individual controls	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓
Mean Outcome	2.909	2.909	2.909	2.909
SD Outcome	0.896	0.896	0.896	0.896
N	16889	16889	16889	16889

Notes: The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution"). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

D.2 Controlling for preferences during formative window

An alternative explanation to the role of policy stringency in shaping norms is that societal preferences could directly shape both policy stringency and individual norms, resulting in spurious correlation between past stringency and time-of-interview preferences influenced by historical norms. Another concern may be that policymakers might be more likely to implement a policy when they know that public support for it is trending up. To allay these concerns, we show that controlling for national average environmental policy preferences during the respondent's formative age does not meaningfully alter the effect of policy exposure (Table D4). If time of interview preferences were a consequence of conditions prior to the formative window or to social norms independent of stringency levels, then controlling for elicited societal preferences in the formative window should obviate the role of the EPS variable. The fact that controlling for societal preferences in the early part of one's formative years does not meaningfully change the direction or magnitude of our main findings is evidence for a causal interpretation for the role of stringency exposure.

The political success of environmental policy proposals may be informative to individuals of contemporaneous societal attitudes, reducing what is sometimes referred to as pluralistic ignorance. In this sense, second-order beliefs could indeed play an important role, serving as an intermediate variable that helps to explain how policy outcomes shape norms and influence an individual's policy support years later.

In Table D5, we estimate our main results controlling for policy preference only of one's peers at the earliest possible year of the formative age window. This allows us to rule out that cohort preferences are exogenous and formed prior to the formative age window, influencing policy outcomes shaping cohort norms independently.

There is some risk that controlling for peer support of environmental policy in the early part of the formative window, as well as societal support across all ages, could be a "bad control", absorbing some of the hypothesized effect we seek to measure. The fact that our results are robust to these controls contributes to our confidence in the formative age hypothesis and the role of policy stringency. The magnitude of the effect of policy stringency exposure, incorporating societal and peer policy attitudes as controls, is likely to be conservative relative to the true effect.

Table D4: EPS exposure during formative age on environmental preferences controlling for aggregate country-level preferences during formative age

	Government should reduce pollution		
	(1)	(2)	(3)
EPS average exposure	0.172*	0.0766*	0.0837*
	(0.101)	(0.0402)	(0.0423)
Country-level formative-age preferences	-0.0115	-0.0981*	0.0675
	(0.141)	(0.0586)	(0.0856)
Outcome variable	Likert	Strongly agree	Strongly agree & Agree
Recession exposure	✓	✓	✓
PM2.5 exposure	✓	✓	✓
HAP exposure	✓	✓	✓
Individual controls	✓	✓	✓
Survey FE	✓	✓	✓
Year of birth FE	✓	✓	✓
Country × Year of interview FE	✓	✓	✓
Country-age linear trends	✓	✓	✓
Mean Outcome	2.902	0.298	0.662
SD Outcome	0.896	0.457	0.473
N	13569	13569	13569
adj. R^2	0.133	0.082	0.128

Notes: The regression controls for the country-level average support for government action to reduce pollution measured during the earliest available year of the formative age for each individual. The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution") in column 1. The outcome variable is a dummy equal to 1 if the individual strongly agrees with the statement, and 0 otherwise, in column 2. The outcome variable is a dummy equal to 1 if the individual either strongly agrees or agrees with the statement, and 0 otherwise, in column 3. All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table D5: EPS exposure during formative age on environmental preferences controlling for aggregate country-level preferences of individuals of age 18 during formative age

	Government should reduce pollution		
	(1)	(2)	(3)
EPS average exposure	0.168*	0.0700*	0.0828**
	(0.0946)	(0.0387)	(0.0412)
Country-level formative-age preferences	0.124*	0.0564	0.0442
	(0.0693)	(0.0376)	(0.0342)
Outcome variable	Likert	Strongly agree	Strongly agree & Agree
Recession exposure	✓	✓	✓
PM2.5 exposure	✓	✓	✓
HAP exposure	✓	✓	✓
Individual controls	✓	✓	✓
Survey FE	✓	✓	✓
Year of birth FE	✓	✓	✓
Country × Year of interview FE	✓	✓	✓
Country-age linear trends	✓	✓	✓
Mean Outcome	2.902	0.299	0.661
SD Outcome	0.896	0.458	0.473
N	13377	13377	13377
adj. R^2	0.133	0.083	0.129

Notes: The regression controls for the country-level average support for government action to reduce pollution measured during the earliest available year of the formative age for each individual. The outcome variable ranges from 1 to 4 (with higher values reflecting stronger agreement with the statement "Government should reduce environmental pollution") in column 1. The outcome variable is a dummy equal to 1 if the individual strongly agrees with the statement, and 0 otherwise, in column 2. The outcome variable is a dummy equal to 1 if the individual either strongly agrees or agrees with the statement, and 0 otherwise, in column 3. All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

E Mechanisms

In this section, we report additional results related to Section 5.3 in the main text.

E.1 Environmental policy direction

We report the tabular results of the heterogeneous effect of EPS exposure conditional on the direction of the change in policy with respect to the contemporaneous level (Table E1). We also document that this heterogeneity is specific to the exposure during the formative age, and the effect is not statistically significant in any other age window to which the contemporaneous policy level is compared (Table E2).

Table E1: EPS exposure during formative age and contemporaneous policy level

	Government should reduce pollution (Likert)	
	(1)	(2)
EPS exposure	0.199**	0.274**
	(0.0824)	(0.108)
$\Delta policy < 0$	-0.258***	-0.234***
	(0.0416)	(0.0423)
EPS exposure $\times \Delta policy < 0$	0.229***	0.194***
	(0.0549)	(0.0520)
Exposure	Formative age	Adulthood
Individual controls	✓	✓
Recession exposure	✓	✓
EQ exposure	✓	✓
Survey FE	✓	✓
Year of birth FE	✓	✓
Country × Year of interview FE	✓	✓
Country-age linear trends	✓	✓
Mean Outcome	2.912	2.909
SD Outcome	0.896	0.896
Mean $\Delta policy$	0.126	0.135
SD $\Delta policy$	0.332	0.342
N	17070	16889
adj. R^2	0.133	0.133

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if, during her formative age, the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. EQ exposure includes PM2.5 and HAP exposure, which are respectively the formative age's average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E2: EPS exposure across age windows and contemporaneous policy level

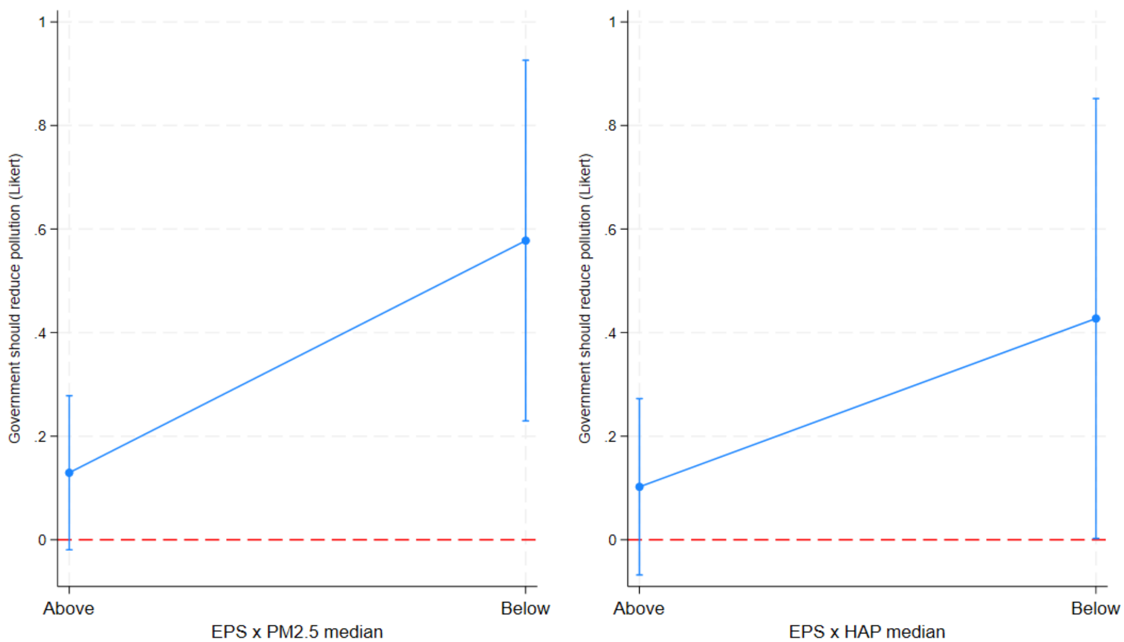
	Government should reduce pollution (Likert)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7+)
EPS exposure	0.199**	0.0153	-0.0539	0.0576	0.0360	-0.0746	0.0582
	(0.0824)	(0.0721)	(0.0326)	(0.0403)	(0.0491)	(0.0732)	(0.0752)
$\Delta policy < 0$	-0.258***	-0.130	-0.0834*	0.0816	0.115	0.103	-0.110
	(0.0416)	(0.143)	(0.0468)	(0.0613)	(0.0959)	(0.0926)	(0.110)
EPS exposure $\times \Delta policy < 0$	0.229***	0.124	0.117*	-0.0948	-0.0819	-0.0814	0.122
	(0.0549)	(0.140)	(0.0654)	(0.0575)	(0.123)	(0.0821)	(0.119)
Age window	18-25	26-33	34-41	42-49	50-57	58-65	66-73
Individual controls	✓	✓	✓	✓	✓	✓	✓
Recession exposure	✓	✓	✓	✓	✓	✓	✓
EQ exposure	✓	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓	✓
Mean Outcome	2.912	2.899	2.901	2.879	2.884	2.944	3.000
SD Outcome	0.896	0.912	0.909	0.906	0.917	0.905	0.888
Mean $\Delta policy$	0.132	0.123	0.111	0.106	0.090	0.094	0.096
SD $\Delta policy$	0.338	0.328	0.314	0.308	0.286	0.292	0.295
N	17070	20300	20211	17904	14522	11179	7788
adj. R^2	0.133	0.135	0.142	0.162	0.163	0.171	0.168

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. EQ exposure includes PM2.5 and HAP exposure, which are respectively the adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

E.2 Environmental Quality exposure

We also explore whether the effect of more stringent environmental policies on individual support is conditional on environmental quality. We show that the effect of EPS exposure is stronger when environmental quality exposure is below the median. We probe the robustness of this result when using exposure over adult life (Figure E1 and tabular results in Table E3). The uninteracted term of exposure to environmental quality below the median is negative and in certain cases not significant, suggesting that environmental conditions downgrade individual support of the government's role in reducing pollution and we are not identifying a "poor environmental quality effect". Rather, we are identifying the effect of experience of both poor conditions and more stringent policies meant to address them. This combination induces support for government pollution actions. Similar results are also obtained when estimating the effect of EPS exposure splitting the sample between above and below median of environmental quality (Table E4). The result underlines the importance of stringent policies targeting poor environmental conditions to sustain support for government to reduce pollution.

Figure E1: Policy stringency effect on environmental preferences by environmental quality exposure during adulthood



Notes: The figure shows the marginal effect of EPS exposure in adulthood when exposure to environmental quality measures in the same period is above or below the median in the sample on the question "Government should reduce pollution" as outcome in Likert scale. The regression controls for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale, recession exposure. The regression also includes year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered at the country-year of interview level. Bins represent the 95% confidence intervals around point estimates.

Table E3: EPS and environmental quality exposure during adulthood

	Government should reduce pollution (Likert)	
	(1)	(2)
EPS exposure	0.129*	0.102
	(0.0759)	(0.0869)
Below median EQ	-0.468***	-0.374
	(0.156)	(0.245)
EPS exposure × Below median EQ	0.448***	0.325
	(0.132)	(0.220)
EQ variable	PM2.5	HAP
Recession exposure	✓	✓
Individual controls	✓	✓
Survey FE	✓	✓
Year of birth FE	✓	✓
Country × Year of interview FE	✓	✓
Country-age linear trends	✓	✓
N	16889	16889
adj. R^2	0.133	0.132

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. Below median EQ is a binary variable equal to one if individuals have been exposed to an environmental quality measure (PM2.5 or HAP) that is strictly below the median exposure value. All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E4: EPS and EQ exposure during adulthood

	Government should reduce pollution (Likert)			
	(1)	(2)	(3)	(4)
EPS exposure	0.516**	0.170	0.446**	0.0858
	(0.212)	(0.108)	(0.210)	(0.125)
Environmental Quality exposure	-0.0658	-0.127*	-0.0790	0.0152
	(0.0525)	(0.0673)	(0.0586)	(0.0745)
Environmental Quality variable	PM2.5		HAP	
Sample	Below	Above	Below	Above
Recession exposure	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓
Mean outcome	2.962	2.878	3.005	2.826
SD outcome	0.877	0.923	0.881	0.912
N	8885	8004	9013	7876
adj. R^2	0.095	0.172	0.100	0.159

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. PM2.5 and HAP exposure are respectively adult years average of age-standardized disability-adjusted life-years lost per 100,000 people due to exposure to fine air particulate matter smaller than 2.5 micrometers (PM2.5) and due to exposure to household air pollution (HAP) from the use of household solid fuels (PM2.5 and HAP exposure variables are inverted such that higher values imply higher quality and divided by 1000 to improve the readability of coefficients). All regressions also include year of birth, country-by-year of interview, survey fixed effects, and country-by-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table E5: EPS and environmental quality exposure during formative age

	Government should reduce pollution (Likert)	
	(1)	(2)
EPS exposure	0.0810	0.0833
	(0.0650)	(0.0690)
Below median EQ	-0.246*	-0.267*
	(0.156)	(0.245)
EPS exposure × Below median EQ	0.293***	0.292***
	(0.109)	(0.144)
EQ variable	PM2.5	HAP
Recession exposure	✓	✓
Individual controls	✓	✓
Survey FE	✓	✓
Year of birth FE	✓	✓
Country × Year of interview FE	✓	✓
Country-age linear trends	✓	✓
N	17070	17070
adj. R^2	0.133	0.132

Notes: All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. Recession exposure is a dummy variable that takes value one if during adulthood the individual has experienced at least one year in which the real GDP per capita growth rate of its country is at least 10% below the previous year's growth rate. Below median EQ is a binary variable equal to one if individuals have been exposed to an environmental quality measure (PM2.5 or HAP) that is strictly below the median exposure value. All regressions also control for survey, year of birth, country-by-year of interview fixed effects and country-age linear trends. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

E.3 Endogenous Learning

Exposure to policies can influence norms, as well as information about welfare-relevant conditions under the policy. For example, if my country has spent generations under a constant policy regime with respect to environmental matters, then it can be difficult for me to directly know the costs and benefits of living under a different policy regime. I could listen to the projections of policy theorists or study conditions in other countries, but only living through and contrasting two or more policy regimes will provide me with the most direct form of evidence to inform my subsequent policy preferences.

This form of direct learning may contribute to an endogenous path of support of green policies. But in observational data, the role of norms and learning is difficult to disentangle. We take two approaches to the measurement and control of endogenous learning in this paper: (1) to understand the assumptions necessary for endogenous learning to explain the data that we observe, and (2) to include as a control variable the volatility of policy stringency, a proxy for the direct learning opportunities that individuals experience.

An endogenous learning channel requires some strong assumptions to explain our empirical findings. Our comparison is of two individuals from different birth cohorts interviewed at the same place and time. For learning to play a role, we must first assume that birth cohort variation produces different information sets, in contrast to the standard assumption that any two adults have access to the same information about policy efficacy, regardless of age.

For learning to play an important role in the *positive* endogeneity we empirically observe, a second assumption is needed: individuals are systematically pessimistic about policy stringency, and that this pessimism is corrected with experience. Imagine that some individuals have experience with stringency while others do not. If everyone has perfect foresight of a policy proposal's impacts, then, absent a role for heterogeneous norms, the observed coefficient on policy exposure would be zero. We do not find this. Now instead imagine that inexperienced individuals tend to be too optimistic about environmental policies ex ante. In that case, experience with policies would leave an individual with systematically weaker support, and we would document negative endogeneity from exposure, i.e., a coefficient less than one. We do not find this. We find a positive coefficient. For the positive endogeneity we observe, for learning to play a role, past experience must have shaped beliefs in a manner that makes government action on pollution more desirable, implying that priors about policy desirability are pessimistic.

Including an individual's experienced policy volatility in our analysis allows us to introduce a proxy for the direct learning, as discussed in Section 2.2. Respondents who have experienced more variability of policy levels would be better equipped to contrast levels and therefore better informed than individuals who experienced relatively stable policy levels. In a horse race between the first and the second moment of the policy exposure distribution, coefficients on the standard deviation, as well as its interaction with the average, suggest a modest impact of learning that, when controlled for, leaves the large effect of average exposure unaltered and suggests a robust role for norms (Table E6).

Table E6: Environmental Policy Stringency mean and standard deviation effects on environmental preferences.

	Government should reduce pollution (Likert)					
	(1)	(2)	(3)	(4)	(5)	(6)
EPS mean exposure	0.236**	0.258*	0.298**	0.207**	0.209**	0.261***
	(0.111)	(0.136)	(0.135)	(0.0914)	(0.0865)	(0.0873)
EPS SD exposure		0.0493	0.204		-0.00666	0.238
		(0.105)	(0.249)		(0.0693)	(0.162)
EPS mean × SD exposure			-0.0854			-0.166
			(0.128)			(0.0999)
Exposure	Adulthood (18-interview year)			Formative age (18-25)		
Recession exposure	✓	✓	✓	✓	✓	✓
EQ exposure	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓
Survey FE	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓
Country × Year of interview FE	✓	✓	✓	✓	✓	✓
Country-age linear trends	✓	✓	✓	✓	✓	✓
N	16889	16889	16889	16889	16889	16889
adj. R^2	0.132	0.132	0.132	0.133	0.133	0.133

Notes: Columns (1)-(3) regress the 4-point Likert scale question about "Government should reduce environmental pollution" on the mean and standard deviation of EPS during adulthood (from the year of age 18 to the year of interview) and their interaction term. Columns (4)-(6) replicate the same specification using mean and standard deviation of EPS during the formative age (from the year of age 18 to the year of age 25). All regressions control for male dummy, unemployment dummy, 3-category education (Lower, i.e., primary education, Middle, i.e., secondary education, Upper, i.e., tertiary education), 10-class subjective income decile scale. All regressions control for survey, country-year of interview, year of birth FE. Observations are weighted using survey weights. Standard errors are clustered by country-year. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F Counterfactual Details

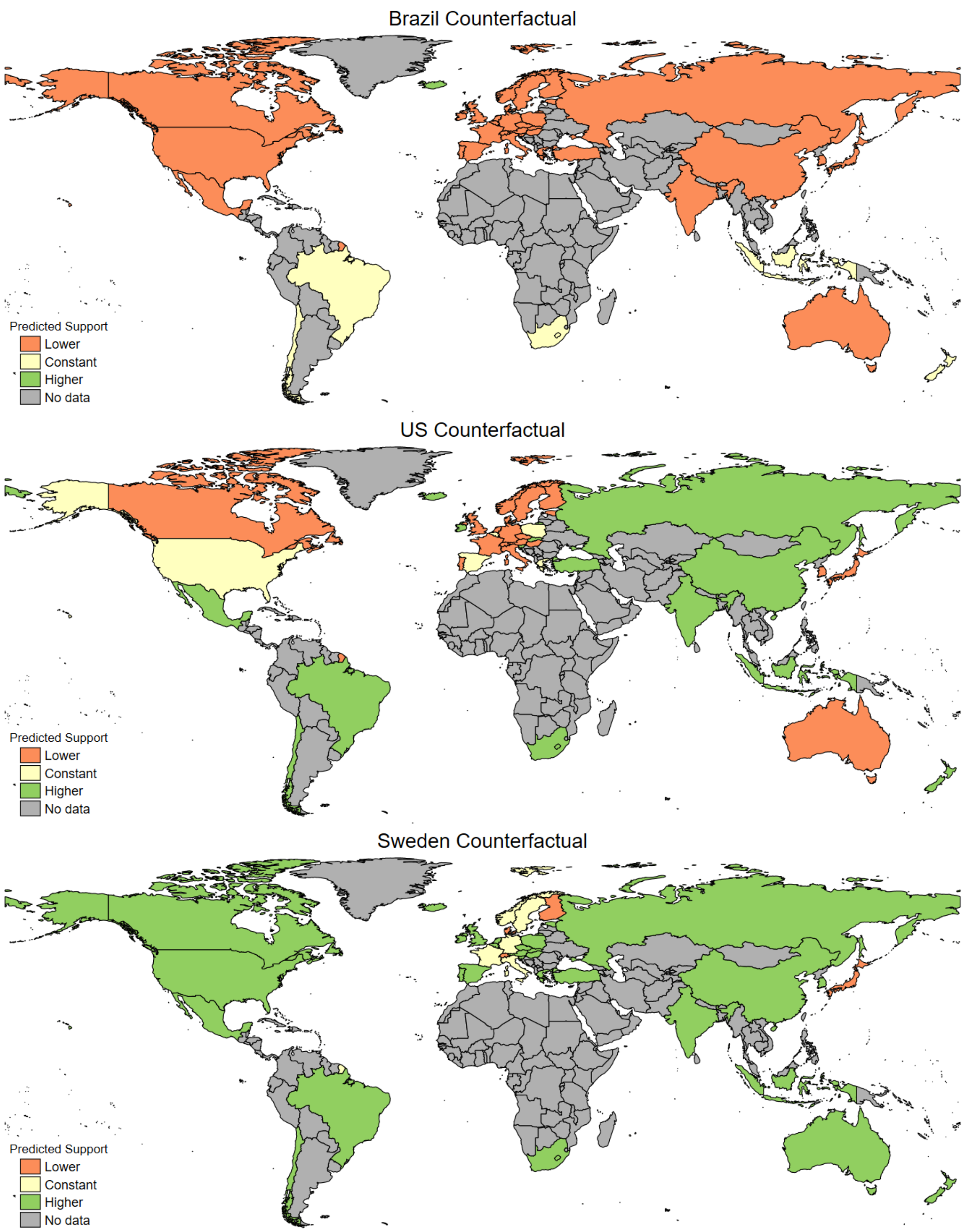
We use our reduced-form estimates to estimate predicted policy preferences under different policy counterfactual scenarios. We answer the following question: if individuals were exposed to another counterfactual policy level, all else equal, how would the change in policy preferences predicted by our model be? We choose as counterfactuals three countries with notable historically different policy stringency levels: Brazil (cross-cohort average policy stringency exposure is 0.46), United States (average policy exposure 1.75, close to the cross-country average 1.74), and Sweden (average policy exposure 2.57).

We take the estimated marginal effect of EPS exposure on the probability to *strongly agree* with the statement "Government should reduce pollution" in column 4, Panel B, Table C6. We choose this approach to define environmental preferences in the most possible conservative manner and to facilitate the interpretation of our results in terms of shares of respondents that strongly support environmental policies.

Using the estimated coefficient on EPS exposure, we predict the counterfactual change in green preferences using the difference between the observed level of policy stringency and the counterfactual policy level in each of the three countries. We take the average across years of interview and report in Figure 4 the model-predicted shares of respondents with *strong* green preferences under each counterfactual.

Figure F1 displays world maps under each counterfactual policy experiment showing which countries have a predicted support for green policies that is lower, constant, or higher than observed in the data.

Figure F1: Predicted support for government reduction in pollution using Brazil, US, and Sweden counterfactual policy stringency exposures



Notes: Each map shows the predicted change in the share of respondents that strongly agree with the statement "Government should reduce pollution", using, respectively, Brazil, US and Sweden's levels of birth-cohorts exposure to past environmental policy stringency, and using the coefficient on EPS in column 4, Panel B, Table C6.