




Environmental Concern Leads to Trade Skepticism on the Political Left and Right

RESEARCH NOTE

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The environmental implications of international trade appear to be associated with public backlash against trade liberalization and efforts at greening international trade. Because public support is essential to environmental and trade policy-making alike, we examine the trade–environment nexus from a public opinion perspective. We investigate whether negative attitudes toward trade are in fact fueled by concern over its environmental consequences. We argue that environmental concern affects how citizens evaluate the costs and benefits of trade, and that such evaluation is moderated by political ideology. The empirical analysis relies on a large representative survey and a population-based survey experiment in Switzerland, a small open economy. We show that environmental concern leads to decreasing appreciation of and support for international trade, with different manifestations of trade skepticism on the political left and right. This suggests (i) that policy-makers should focus more on greening global supply chains, and thus trade, if they wish to sustain public support for liberal international trade policy; and (ii) that the public follows informational cues on the environmental impacts of trade.

Las implicaciones ambientales del comercio internacional parecen estar asociadas con la reacción pública contra la liberalización del comercio y los esfuerzos por implementar políticas medioambientales adecuadas en el ámbito del comercio internacional. Debido a que el apoyo público es esencial para la formulación de políticas ambientales y comerciales, analizamos el nexo entre comercio y medioambiente desde la perspectiva de la opinión pública. Investigamos si las actitudes negativas hacia el comercio están, de hecho, alimentadas por las inquietudes sobre sus consecuencias ambientales. Sostenemos que la inquietud sobre el medioambiente afecta la forma en que los ciudadanos evalúan los costos y beneficios del comercio, y que dicha evaluación está condicionada por la ideología política. El análisis empírico se basa en una gran encuesta representativa, y en un estudio realizado con una encuesta a la población en Suiza, una pequeña economía abierta. Mostramos que la inquietud sobre el medioambiente conduce a un menor reconocimiento y apoyo al comercio internacional, con diferentes manifestaciones de escepticismo comercial en la izquierda y la derecha políticas. Esto sugiere (i) que los responsables políticos deberían centrarse más en elaborar políticas medioambientales adecuadas para las cadenas de suministro globales y, por lo tanto, el comercio, si desean mantener el apoyo público a la política liberal del comercio internacional, y (ii) que el público sigue las señales informativas sobre los impactos ambientales del comercio.

Les implications environnementales du commerce international semblent être associées à une réaction publique contre la libéralisation du commerce et à des efforts visant à écologiser le commerce international. Le soutien du public étant essentiel à l'élaboration des politiques environnementales et commerciales, nous examinons la relation entre commerce et environnement du point de vue de l'opinion publique. Nous cherchons à savoir si les attitudes négatives envers le commerce international sont alimentées par des préoccupations liées à ses conséquences environnementales. Nous soutenons que les préoccupations environnementales affectent la manière dont les citoyens évaluent les coûts et bénéfices du commerce et que cette évaluation est modérée par l'idéologie politique. Notre analyse empirique se base sur une grande enquête représentative et sur une expérience intégrée dans un sondage en Suisse, une petite économie ouverte. Nous montrons que les préoccupations environnementales entraînent une diminution de l'appréciation et du soutien au commerce international, avec différentes manifestations du scepticisme à l'égard du commerce à gauche et à droite de l'échiquier politique. Cela suggère (i) que les décideurs politiques devraient se concentrer davantage sur l'écologisation des chaînes d'approvisionnement mondiales, et donc du commerce, s'ils souhaitent conserver un soutien du public à une politique libérale du commerce international, et (ii) que le public suit les signaux d'information sur les impacts environnementaux du commerce.

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Introduction

International trade increases the efficiency of production and the number of goods and services available to consumers globally (Ben-David and Loewy 1998). At the same time, trade also results in negative externalities (Hertwich and Peters 2009). This raises the question of whether the geographical dissociation of production and consumption through trade leads to shifts in environmental impacts among consuming and producing economies (Wood et al. 2018). In public debates on the trade–environment nexus, transnational business activities are commonly associated with environmental problems worldwide (Copeland and Taylor 2004; Spilker, Koubi, and Bernauer 2017). While a decoupling of economic growth from resource use is necessary to reduce the global environmental footprint of humanity to sustainable levels (Hoekstra and Wiedmann 2014), such decoupling thus far appears to take place primarily in high-income countries, but only if footprint shifting via trade is not factored in (Wiedmann and Lenzen 2018). Such footprint shifting, i.e., pollution-intensive production moving from higher- to lower-income countries, has been noted in many contexts (e.g., Kanemoto et al. 2014). In fact, negative environmental impacts of global production networks appear to accrue overproportionally in poorer countries (see Jorgenson and Rice 2005; Yang et al. 2012; Aklin 2016).

At the same time, we note that many citizens in richer countries, both from the left and right of the political spectrum, voice skepticism about international trade liberalization.¹ Prominent examples are the failed negotiations between the European Union (EU) and the United States on the Transatlantic Trade and Investment Partnership (TTIP) and between the EU and Canada on the Comprehensive Economic and Trade Agreement (CETA). These are high-profile cases where the stalling of trade negotiations has been linked to the opposition of the public, with motivations for opposition prominently including environmental concern (Hübner, Deman, and Balik 2017; Eliasson and Huet 2018). This points to the crucial role of public opinion for whether and how trade policy is enacted.² Hence, a better understanding of citizens' preference formation in this area is important (Kono 2008; Dür and Mateo 2014). We therefore address two core questions in this research note: Does environmental concern more generally and concern about

the environmental impacts of trade in particular explain trade skepticism? Does political ideology moderate this proposed relationship?

Theoretically, the existing literature on trade preferences focuses to a large extent on the embedded liberalism argument. This argument explains trade liberalization and globalization backlash based on economic issues, particularly redistribution through trade (Scheve and Slaughter 2001; Kaltenthaler, Gelleny, and Ceccoli 2004; Burgoon 2009; Rho and Tomz 2017; Rodrik 2018; Schaffer and Spilker 2019; Bearce and Moya 2020). In this argument, nontrade factors (e.g., environmental concern) are subordinate to economic considerations or constitute economic protectionism in disguise (Morin, Dür, and Lechner 2018). However, recent studies show that noneconomic considerations play an important role for trade preference formation (for an overview, see Mansfield, Milner, and Rudra 2021; Walter 2021), and a small recent literature examines the effect of environmental considerations on trade preferences in particular. This largely observational literature shows that in developed (Ehrlich 2010; Bechtel, Bernauer, and Meyer 2012) and developing countries (Nguyen and Bernauer 2015; Spilker, Bernauer, and Umaña 2018), many citizens are worried about the environmental impacts of trade. Directly related to our case, Bechtel, Bernauer, and Meyer (2012) show that Swiss citizens concerned about the environment are more skeptical regarding economic globalization and more supportive of protectionist trade policy. Building on these contributions, we propose that higher environmental concern should be linked to lower preferences for free trade. As the building of political coalitions is crucial for understanding trade policy, we, in line with Bechtel, Bernauer, and Meyer (2012), also investigate whether environmental concern has an influence on trade policy preferences irrespective of political ideology, or whether and how the effect of environmental concern on trade preferences differs on the political left and right. Recently, Nguyen, Huber, and Bernauer (2021) provide first survey-experimental evidence from six OECD countries that the linkage between the environmental implications of trade and trade preferences could be causal in nature. We are in the unique position of linking these (quota-representative) survey-experimental data with nuanced and high-quality population representative data from the same country context and for the same time-frame to provide further evidence whether this is the case. Also, we use both datasets to investigate in detail to what extent political ideology might be a moderator, rather than a confounder in the relationship between environmental concern and trade preferences. As noted by Ehrlich (2018), political ideology is regularly found to be a strong predictor of both protectionism and free trade, and matters for trade preferences on the level of states (Dutt and Mitra 2005), legislators (Milner and Tingley 2011), and citizens (Jedinger and Burger 2020). At the same time, a large literature on environmental attitudes and environmental policy preferences pays significant attention to effects of general political attitudes (e.g., Dunlap 1975; Czarnek, Kossowska, and Szwed 2021). Hence, we investigate why environmental concern and trade policy preferences co-occur. Even if environmental concern was related to trade policy preferences, this effect could mainly run through correlation with political ideology, or go beyond that and moderate the effect of environmental concern on trade.

We investigate this relationship in the context of Switzerland. Trade openness is vital to Switzerland's economic model. Switzerland has a higher trade volume and globalization index than its neighboring countries or the United

Office for the Environment and by ETH Zurich. The data for the survey experimental part were collected and kindly provided by Quynh Nguyen (in collaboration with Thomas Bernauer), and are part of a larger study on trade and environmental attitudes in six OECD countries (Nguyen, Huber, and Bernauer 2021). We are grateful to Michael Erne and Daniel Schwarz (Smartvote) for providing data on the policy positions of political candidates. The data underlying this research note and the corresponding replication code are available on the ISQ Dataverse, at <https://dataverse.harvard.edu/dataverse/isq>.

¹The 2019 Eurobarometer survey found that 80 percent of respondents agree that rules for international trade are necessary, 60 percent agree that EU trade policy should take social/environmental impacts of trade into account, and 50 percent name respect for EU environmental/health standards as a main priority of EU trade policy (up 20 percentage points compared to 2010 and top-named priority in seven EU countries; Eurobarometer 2019).

²Public opinion had little place in early theories of foreign policy-making, as the public was proposed to know little on and matter little for foreign policy-making (see Milner and Tingley (2013), for an overview on the arguments). Recent research points to the public both being a vigilant observer (e.g., Kertzer and Zeitzoff 2017) and its preferences mattering for foreign policy-making (Goldsmith and Horiuchi 2012), including trade policy (see, e.g., Dür and Mateo 2014, and the examples indicated above). Concerning environmental policy, as summarized by Nguyen, Huber, and Bernauer (2021), studies both in the United States and Europe indicate that political elites follow the environmental preferences of their constituents in environmental policy-making (e.g., Weaver 2008; Vandeweerd, Kerremans, and Cohn 2016; Anderson, Böhmelt, and Ward 2017).

States (see Online Appendix Section A.4.3). Consequently, a substantial share of voters (9 percent) sees trade policy as a top-three policy issue (while even more, 36 percent, indicate this is the case for the environment).³ Moreover, trade and environmental policy meaningfully differentiate political parties and candidates in Switzerland, who show a large variation in the policies they offer to voters (see Online Appendix Section A.4.1). However, Swiss citizens still hold levels of environmental concern comparable to citizens of other OECD countries and hold a similar level of perception of personal trade impact, trade knowledge, and preferences on limiting international trade compared to citizens in other high-income countries (see Online Appendix Section A.4.2). Additionally, in the consociational political system of Switzerland, with its heavy reliance on formal and informal coalitions (see, e.g., Hänggli and Häusermann 2015), citizens rely on political ideology to structure policy preferences (cf. Fortunato, Stevenson, and Vonnahme 2016, who propose that the left-right axis matters for particular institutional contexts only). Altogether, this suggests that Switzerland is a case well-suited for our question as environmental concern and trade policy both matter for the citizenry, citizens face a meaningful trade-off, and political ideology has the potential of being a moderator for Swiss citizens' political attitudes.

The research reported in this note contributes to the literature in three ways. First, we study the relationship between environmental concern and trade skepticism with new data from a large and high-quality population-representative sample of the Swiss population ($N = 4,813$). These data allow us to employ very nuanced measures of both environmental attitudes and trade preferences in the analysis. Thereby, we shed more light on whether and how environmental concern relates to differing degrees and types of trade skepticism. Second, we investigate whether and how political ideology moderates how environmental concern relates to trade preferences concerning different dimensions of trade policy. Third, building on the data of Nguyen, Huber, and Bernauer (2021), we investigate whether an experimental manipulation of the environmental impacts of trade in both a positive and a negative direction (which is paramount to simulating different elite cues) via a survey-embedded vignette experiment ($N = 1,538$) induces shifts in trade preferences on the political left and right. Taken together, we fill an important gap in our understanding of how citizens' environmental attitudes inform trade preferences, and how political ideology might moderate this relationship.

Empirically, we show that ideology indeed affects the relationship between environmental concern and trade attitudes, and that environmental concern leads to different types of trade skepticism on the political left and right. Such insights are important for better understanding the potential for pro- and anti-free-trade coalitions along and across conventional ideological lines in modern democracies (Milner and Judkins 2004). Given our re-analysis of the experiment of Nguyen, Huber, and Bernauer (2021) for the Swiss case and differentiated by ideology, our study also provides insights into whether the relation between non-economic attitudes, such as environmental concern, and preferences on limiting free trade is causal in nature, or whether this relationship reflects economic protectionism in disguise (Ehrlich 2010).⁴ In a first step, our correlational

evidence reveals a nuanced relationship between different dimensions of trade and environmental attitudes. We find robust evidence that individuals with higher levels of environmental concern are more trade skeptic. As we control for ideology (next to several other sociodemographic factors), we are confident that this environment-trade skepticism is more than 'protectionism in disguise'. However, while environmental concern correlates with negative attitudes toward economic globalization generally on the political left, it correlates with protectionist trade policies on the political right. In a second step, we exploit experimental increases or decreases of concern over the environmental impacts of trade via visual and textual survey-experimental vignettes for the overall sample, and for subgroups of political ideology. With the concern-inducing vignette, an increase in concern relates causally to a perception of lower benefits from international trade, more negative feelings toward international trade, and in tendency more protectionist trade policy attitudes (and vice versa for the serenity-inducing vignette). We observe this relation for both the political left and right. Notably, though, experimental treatments that would go against prior beliefs of respondents seemingly show stronger effects (e.g., 'trade helps the environment' shifts perceptions of the environmental impacts of trade particularly strong for the political left). Concerning policy, the political left responds strongest for policy that would limit trade to protect the environment, while the political right responds strongest to (protectionist) import bans, mirroring the correlational evidence on protectionism. We thereby provide causal evidence that attitudes toward trade are a function of environmental preferences and beliefs for both the political left and right, but with nuances.

At a more general level, our research adds to previous work that highlights the role of information (Hainmueller and Hiscox 2006; Rho and Tomz 2017) and noneconomic drivers (Mansfield and Mutz 2009) in trade policy preference formation or related policy areas (Rudolph, Kolcava, and Bernauer 2021). Sabet (2016), e.g., argues that nonmaterial predispositions (in her case, sentiment toward foreign cultural influences) are a first-order determinant of trade preferences, and economic considerations only come to play a role for trade-preference formation when these sentiments are weak. Finally, and given that both our sample and the broader European public (Eurobarometer 2019) are rather concerned about the environmental impacts of trade, our findings are in line with recent arguments that irrespective of political ideology, individuals are likely to support a 'greening' of international trade, and that environmental clauses in trade agreements could help alleviate public concerns over free-trade agreements and environmental footprint shifting (Jinnah and Morin 2020).

Methods

We rely on two complementary data sources to assess whether environmental concern leads to more negative attitudes toward international trade and whether this relationship is affected by political ideology.

Population-Representative Survey

Our first set of data comes from the Swiss Environmental Panel (SEP), a large dual-mode panel survey by the authors, carried out since spring 2018 (Rudolph et al. 2020). The

³Based on data from our population-representative survey.

⁴The experiment of Nguyen, Huber, and Bernauer (2021) manipulated respondents' understanding of the impact of trade on the environment, both in their home country and abroad, and both in a positive and in a negative direc-

tion. This allows us to causally link specific concern or serenity (i.e., decreased concern) for trade impacts to shifts in how respondents assess the benefits from trade as well as their trade policy preferences.

sampling is conducted by the Swiss Federal Statistical Office (BfS), resulting in a sample that is representative of the Swiss resident population aged 15+. The items on environmental and trade attitudes are part of the first wave of the panel, fielded between February and May 2018. The sample size of the first wave is 4,813, resulting in a raw response rate of 32.17 percent.⁵

The dependent variables in our model are based on a battery of six questions measuring different facets of trade policy preferences on a five-point Likert scale (see Online Appendix Table A.1 for detailed wording). The first item, ‘economic openness’, measures attitudes toward international market openness in general, while the second, ‘economic openness for companies’, focuses on the impacts of globalization on companies. The third and fourth items address sector-specific protectionist measures: ‘job-related protection’ covers the attitude of respondents regarding trade restrictions to protect jobs in sectors where they are at risk, while ‘agriculture protection’ asks respondents whether the agricultural sector should be protected from imports. Items five and six address economic liberalism from two different angles: ‘price and quality’ asks respondents whether the origin of a product should matter beyond price and quality, whereas ‘safe food access’ asks whether the imports of food deemed safe for health should be restricted.

Items one, three, and five are identical to items used in Bechtel, Bernauer, and Meyer (2012). For the presentation of results, we inverted the scale of some items such that higher values always indicate more negative attitudes toward trade (trade skepticism). The six items describing trade attitudes are aggregated into a single variable (‘main dimension of trade’) through a Principal Component Analysis (PCA) that explicitly takes into account and imputes missing values.

Concern for the environment is measured through a battery of nine items with a five-point Likert scale (see Online Appendix Table A.2 for detailed wording). Those nine items span the three components of environmental concern commonly identified in the sociological literature (see, e.g., Franzen and Meyer 2009): the cognitive component (the understanding of environmental issues and risks), the affective component (the emotional reaction to those issues and risks), and the conative component (the willingness to address those issues and risks). The nine items describing environmental concern are aggregated into a single variable (‘main dimension of environmental concern’) through a PCA, which is validated with a scree test.

Political ideology is measured on a left–right scale, which ranges from 0 (left) to 4 (right), with each of the response options explicitly labeled, namely ‘left’, ‘center-left’, ‘center’, ‘center-right’, and ‘right’.⁶

Survey Experiment

Our second set of data comes from a survey experiment that was fielded by IPSOS via computer-assisted web interviews with 1,538 respondents from Switzerland.⁷ Quotas on age,

⁵Further information on the panel and access to data is available at <https://ib.ethz.ch/research/sep.html> and in Rudolph, Quöß, and Bernauer (2020).

⁶We apply established survey items for left–right (L–R) self-placement to capture ideology. While ideology is challenging to measure (Bauer et al. 2017), we show empirically that L–R placement predicts partisanship, is stable over time, and similarly applied in the three Swiss language regions (based on the Swiss Environmental Panel data). See Online Appendix Section A.3 for details.

⁷The survey-experimental data are part of a larger study on trade and environmental preferences fielded in six OECD countries (Nguyen, Huber and

gender, region, and education ensured that survey participants are comparable to the Swiss population. The survey was administered in German and French (the main languages of the country) between February 27 and March 9, 2017.⁸

For the experiment, participants are randomly exposed to varying information about the relationship between trade and its impacts on the environment domestically and abroad. This direct treatment (Mutz 2011) aims at altering respondents beliefs about the environmental consequences of trade, inducing concern or serenity. We thereby address whether the relation between environmental concern and trade preferences from correlational studies (including our own) is causal in nature (Tingley 2014). This research design has an important prerequisite: environmental concern of survey respondents for trade impacts needs to be movable. We propose this is the case for three reasons. First, the experiment does not aim at moving environmental concern generally (which might be sticky), but uses factual displays of information for the *specific consequences of trade* on the environment. Second, baseline knowledge on environmental consequences of trade is low in our survey population, and citizens can therefore gain information.⁹ Third, knowledge (and hence information) directly constitutes part of the cognitive dimension of environmental concern (Bamberg 2003; Franzen and Meyer 2009) but is empirically also directly linked to its other components (Pagiaslis and Krontalis 2014). By changing information levels, we propose that, through this cognitive dimension, environmental concern (for trade impacts) is directly manipulated. The experiment was followed by comprehension checks to ensure that respondents fully read the factual information (for details, see Nguyen, Huber, and Bernauer 2021), while manipulation checks (as reported in the ‘Results’ section) assess whether worry for the environmental impacts of trade indeed shifted through the experiment.

Turning to the experimental design, participants were randomly assigned to one of six groups—a control group and five treatment groups. The treatment design relies on a full factorial design for whether trade affects the environment in Switzerland positively or negatively, and whether it affects the environment for Switzerland’s trading partners positively or negatively. As the ‘Results’ section focuses on treatment groups 1 (trade generally ‘helps’ the environment domestically and abroad) and 2 (trade generally ‘hurts’), we discuss these two groups in the following.

Vignettes began by a general statement summarizing the main message whether trade helps or hurts the environment. Subsequently, respondents read a detailed argument on why this is the case. In conclusion, they looked at a graphical illustration that brought about the main relationship and the corresponding argument again. Figure 1 gives an overview of the flow of the argument, and its exact wording for treatment groups 1 and 2, and how it was embedded

Bernauer 2021), and were compiled by Quynh Nguyen in collaboration with Thomas Bernauer; we focus on Swiss respondents here to ensure maximum comparability between the correlational and survey-experimental evidence.

⁸The survey experiment was not administered to the Italian speaking part of the population in the canton of Ticino (4 percent of the country population). As reported in Online Appendix Figure A.8, trade attitudes and environmental concern are very similarly expressed there, on average, compared to the other two language regions.

⁹When asked about where environmental consequences of goods consumed in Switzerland accrue, only 38 percent of the respondents in the first wave of the SEP correctly reply ‘abroad’, while 17 percent indicate ‘domestically’ and 45 percent ‘half abroad/half domestically’. Presberger et al. (2022) provide evidence on how survey-experimental information provision relates to increased knowledge for our sample.

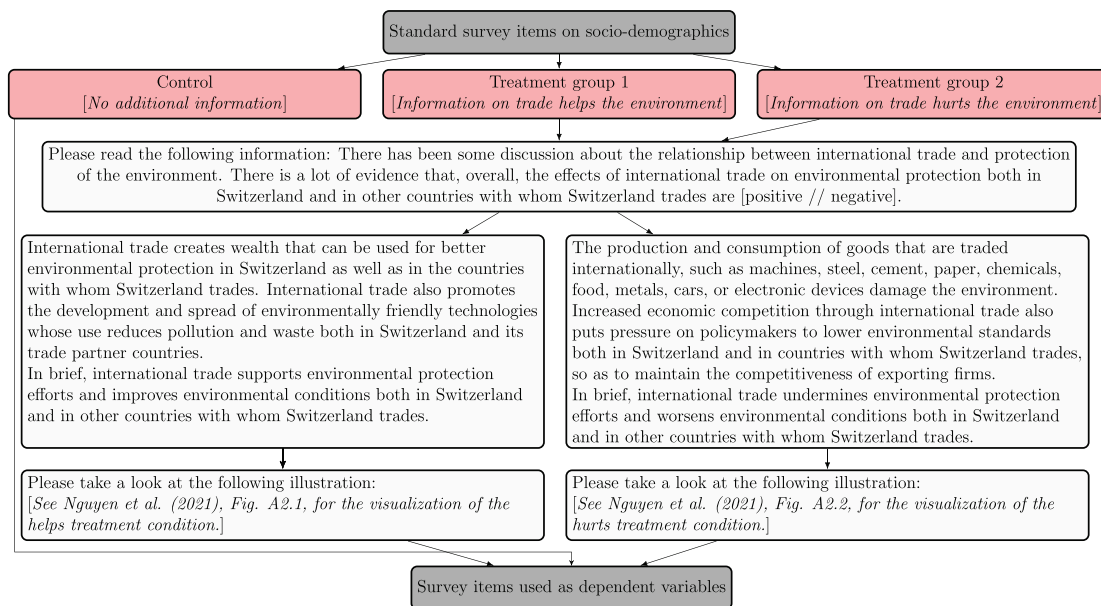


Figure 1. Flow, and wording of vignettes for treatment groups 1 and 2 and the control group (as implemented in Nguyen, Huber and Bernauer 2021).

in the survey. The visual appearance of the vignettes is presented in figures A2.1 and A2.2 of Nguyen, Huber, and Bernauer (2021).

Treatment groups 3–5 saw more complicated combinations of these arguments, varying whether trade helps domestically, but hurts abroad (and vice versa). Online Appendix Section A.2.1 provides a comprehensive description of all treatments.

Overall, with this survey experimental manipulation, respondents see new information on the environmental consequences of trade, with the aim of changing their beliefs about these consequences, and ultimately their concern over the environmental impacts of trade.

After exposure to the experimental vignettes, respondents answered several questions (our dependent variables) on beliefs, attitudes, and policy preferences with regard to international trade. These include a manipulation check (perception of the relationship between trade and environment), whether respondents and the country benefit from trade, spontaneous associations respondents made with trade, and trade policy preferences. Online Appendix Section A.2.2 provides the exact wording of these survey items. To assess subgroup effects by political ideology of the respondents, we differentiate respondents by their self-rated position on a seven-point scale ranging from left to right, asked toward the end of the survey, after the experimental manipulation and the questions on our core dependent variables.¹⁰

We then analyzed the data by comparing conditional means for the different vignette treatments to the control group, and also relative to each other and within subgroups defined by political ideology. Supplementary analysis (see Online Appendix Section A.2.3) shows that randomization worked well, as we do not see differences in respondents'

observable characteristics (age, gender, language, education, employment, income, household size) between the control group and the core treatment groups 1 and 2.

Results

The General Association of Environmental Concern and Trade Preferences in a Population-Representative Survey

We first investigate the general correlation between environmental concern and trade attitudes. We then inquire whether this relationship is moderated by political ideology. The main results are shown in table 1. For the six individual trade attitude items and our aggregated measure of trade attitudes (first PCA component of these six items), we estimate ordinary least-squares (OLS) models depicting the main relationship between environmental concern and trade attitudes (table 1, models 1–7.I). In a second step, we estimate OLS models that include an interaction term between environmental concern and L–R ideology (table 1, models 1–7.II). This second step allows us to assess whether the relationship between environmental concern and trade attitudes is moderated by political ideology. Online Appendix Table A.3 provides the full models' specifications, and we give a short interpretation of how the covariates correlate with trade preferences in Online Appendix Section A.1.3.

Our key finding is that environmental concern and trade skepticism are positively correlated (model 1.I). Looking in more detail at the different trade items (models 2–7.I), the correlation between environmental concern and specific trade attitudes is also in the expected direction (though insignificant for safe food access).

Substantively, the shift in trade skepticism with a one unit increase of environmental concern is largest for the protection of domestic agricultural production and smallest for safe food access. An increase of one standard deviation of environmental concern leads to an increase in trade skepticism of 0.16 standard deviations on the main dimension of trade. For the six items that comprise our aggregated measure, an increase by one standard deviation

¹⁰ Question wording: "In political matters, people talk of 'the left' and 'the right.' Generally speaking, how would you place your views on this scale? 1 means 'left' and 7 means 'right'." Respondents with an assessment of 1–3 are coded as left (34 percent of the sample), with an assessment of 4 as center (28 percent), with 5–7 as right (38 percent). In Online Appendix Section A.3, we show that the LR self-placement is unaffected by the experimental treatments. This is a precondition for interpreting moderation effects meaningfully.

Table 1. Dimensions of trade policy preferences (OLS models)

	1. Main dimension of trade		2. Economic openness		3. Economic openness for companies		4. Job-related protection		5. Agriculture protection		6. Price and quality		7. Safe food access	
	I	II	I	II	I	II	I	II	I	II	I	II	I	II
Main dimension of environmental concern	0.173 ^{***} (0.019)	0.195 ^{***} (0.038)	0.546 ^{***} (0.112)	0.958 ^{***} (0.234)	0.510 ^{***} (0.112)	0.658 ^{***} (0.235)	0.598 ^{***} (0.107)	0.006 (0.224)	1.313 ^{***} (0.111)	1.152 ^{***} (0.232)	1.070 ^{***} (0.121)	1.251 ^{***} (0.251)	0.194 [*] (0.111)	0.620 ^{***} (0.232)
Main dimension of environmental concern × L-R ideology		-0.010 (0.015)		-0.183 ^{**} (0.092)		-0.066 (0.092)		0.264 ^{***} (0.088)		0.071 (0.091)		-0.081 (0.099)		-0.190 ^{**} (0.091)
L-R ideology	0.020 ^{***} (0.003)	0.026 ^{**} (0.011)	0.095 ^{***} (0.019)	0.220 ^{***} (0.065)	0.007 (0.019)	0.052 (0.066)	0.123 ^{***} (0.018)	-0.059 (0.063)	0.189 ^{***} (0.018)	0.140 ^{**} (0.065)	0.032 (0.020)	0.088 (0.071)	0.046 ^{**} (0.018)	0.177 ^{***} (0.065)
Region and socioeconomic controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	3,539	3,539	3,046	3,046	3,115	3,115	3,386	3,386	3,432	3,432	3,510	3,510	3,451	3,451
Adjusted R^2	0.148	0.148	0.089	0.090	0.068	0.068	0.125	0.127	0.175	0.175	0.090	0.090	0.056	0.057
Residual std. error	0.182	0.182	1.035	1.034	1.053	1.053	1.038	1.037	1.079	1.080	1.188	1.188	1.083	1.082
F-statistic	45.035 ^{***}	42.053 ^{***}	22.147 ^{***}	20.958 ^{***}	17.300 ^{***}	16.178 ^{***}	35.536 ^{***}	33.849 ^{***}	52.871 ^{***}	49.382 ^{***}	25.789 ^{***}	24.113 ^{***}	15.737 ^{***}	14.995 ^{***}

Notes: OLS regressions. Robust standard errors in parentheses. Control variables include normalized income, gender, indicator for non-Swiss citizenship, age (in years), indicators for linguistic regions (French, Italian, and German), and occupational activity (retired, student, unemployed, caring, volunteer, and working). Full specifications in Online Appendix Table A.5. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

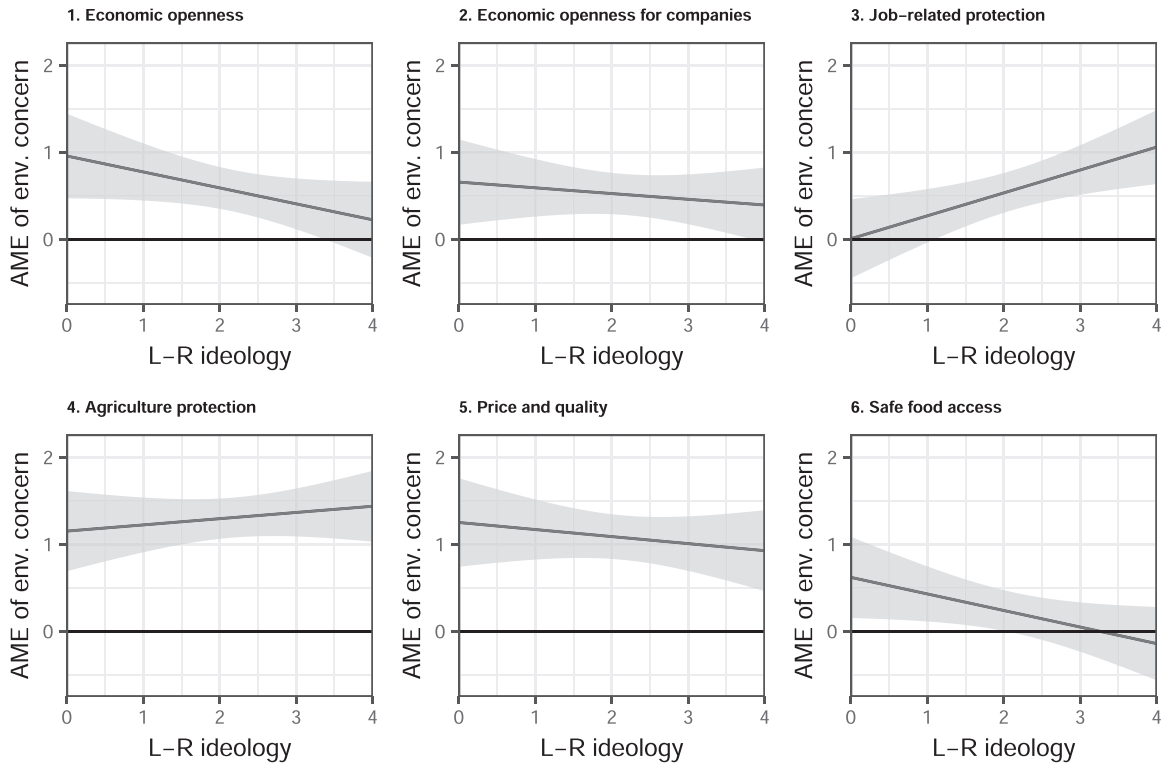


Figure 2. Average marginal effects of environmental concerns on attitudes toward six-dimensions of trade. Effects are computed based on OLS estimates from model II (see table 1). The shaded areas indicate the 95 percent confidence intervals computed with robust standard errors.

of environmental concern leads to an increase in trade skepticism ranging from 0.03 to 0.20 standard deviations of the respective trade items.¹¹

We now turn to the effect of political ideology as moderating variable, i.e., we specify an interaction term between a respondent's environmental concern score and her L-R self-evaluation. For the main dimension of trade, the interaction term between environmental concern and political ideology is close to zero and statistically insignificant (model 1.II). This result seems to be at odds with prior literature (Bechtel, Bernauer, and Meyer 2012), where moderation by political ideology plays an important role. When assessing the moderating effect for specific trade items, we find substantial moderation for several items (models 2–7.II). Moreover, the coefficients point in a positive direction for the 'protectionist' trade attitudes, and in a negative direction for the rest, especially trade attitudes reflecting 'globalization skepticism'. This is to say that the null-finding for the interaction term in model 1.II comes about by aggregating the individual trade items in our main dimension of trade, where the moderating effects for the individual trade items cancel out. The interaction term is significant at the 5 percent level for the economic openness, job-related protection, and safe food access dimensions.

To interpret substantive effect sizes, we computed average marginal effects (see figure 2) of environmental concern conditional on left–right ideology for the six trade items. For the two items measuring attitudes toward eco-

nomics openness, the concern for the environment has a greater impact on the trade skepticism on the political left than on the right. The same effect can be observed for the price and quality dimension. The opposite trend appears for the dimensions of trade related to the protection of jobs and agriculture: the effect of environmental concern on trade skepticism is stronger for conservative respondents.

Finally, we conducted a series of robustness checks regarding our modeling choices and report these in Online Appendix Section A.1.4. They support our main findings. The interaction effects are slightly larger and still significant when using the additive index for environmental concern instead of a PCA as in Bechtel, Bernauer, and Meyer (2012). We also used dichotomized dependent variables with a probit model and removed the L-R ideology variable from model I. In all these specifications, the coefficients for environmental concern and the interaction term point in the expected direction. Taking into account a recent critique regarding the robustness of linear interaction effects and building on Hainmueller, Mummolo, and Xu (2019), we apply descriptive visualization techniques and a binning estimator to show that it is reasonable to build a linear interaction model for our analyses, although the results for the outcome variables economic openness for companies and safe food access should be interpreted with caution (see Online Appendix Section A.1.5).

A Survey Experimental Stimulus to Environmental Concern

We next investigate the effect of specific experimental prompts on the relationship between trade and the environment for the political left and right. Respondents

¹¹ Respondents who are politically more conservative are also more trade skeptic. The coefficient of political ideology is positive for all items (the relationship is insignificantly estimated for the economic openness for companies, and the price and quality dimensions).

Table 2. Effects of survey experimental treatments on perceptions of trade and trade policy preferences

	(1) <i>Environmental impacts of trade</i>	(2) <i>Personal benefits</i>	(3) <i>Country benefits</i>	(4) <i>Associations with trade</i>	(5) <i>Limit trade?</i>	(6) <i>Three-cat. pref. on import bans</i>
Helps	0.838*** (0.110)	0.360*** (0.103)	0.324*** (0.105)	0.199** (0.0872)	-0.184 (0.116)	0.126 (0.173)
Hurts	-0.156 (0.109)	-0.182* (0.103)	-0.379*** (0.109)	-0.136 (0.0885)	0.111 (0.118)	-0.163 (0.170)
Constant	3.238*** (0.0785)	4.173*** (0.0715)	4.462*** (0.0772)	4.038*** (0.0623)	3.389*** (0.0849)	
N	728	718	732	768	743	714
Control group mean	3.238	4.173	4.462	4.462	3.389	
Helps coef./control mean	0.259	0.0862	0.0726	0.0726	-0.0543	
Hurts coef./control mean	-0.0482	-0.0435	-0.0849	-0.0849	0.0328	

Notes: Effect of experimental treatments on the average evaluation of dependent variable indicated in column header. OLS used for models 1–5 and ordered logistic regression used for model 6. Dependent variables are (1) “What overall effects will international trade have on environmental protection?”; (2) “What do you think about the growing trade and business ties between Switzerland and other countries [for] myself and my family?”; (3) “... [for] Switzerland as a country?”; (4) index from replies to association questions (“spontaneously”, what is “the first thing that comes to your mind when you hear about international trade?”) concerning bad–good, threat–opportunity, unemployment–jobs, fear–hope, poverty–wealth, unfair–fair; (5) “Limit international trade to reduce negative environmental consequences”; and (6) “Do you favor or oppose new limits on imports, or haven’t you thought much about this?”. Answer scales 1 (negative) to 7 (positive) for models 1–4, 1 (disagree) to 6 (agree) for model 5, and three-categorical scale: “favor”, “not thought much about it”, and “oppose” for model 6. Robust standard errors used. Cut-points for model 6 are -1.051 (0.133) for cut 1 and 0.220 (0.126) for cut 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

received treatments whether trade has a negative or positive impact on the environment at home and/or abroad. We propose that thereby respondents’ beliefs over the environmental impacts of trade change, this is, that specific concern or serenity over this environmental impact is induced. We then investigate whether this affects how respondents see the benefits from trade and their trade policy preferences. Table 2 summarizes the effects of the treatments on a bundle of outcomes, measured on Likert scales from 1 (very negative) to 7 (very positive). Model 1 presents the results of a manipulation check. When asked “What overall effects will international trade have on environmental protection?”, control group respondents assess the effects of trade on environmental protection rather negatively (mean of 3.2). The experimental vignettes shift respondent opinions in the expected direction. The vignette that highlights that “trade *helps* the environment domestically and abroad” (hereafter *helps-treatment*) shifts respondent evaluations upward to a neutral position on average (mean of 4.1, i.e., an increase of 26 percent of the control group mean). In comparison, the vignette that highlights that ‘trade *hurts* the environment domestically and abroad’ (hereafter *hurts-treatment*) makes respondents’ assessments more negative (mean of 3.0, i.e., a decrease of 5 percent of the control group mean, not statistically significant). These results reflect the analyses of Nguyen, Huber, and Bernauer (2021) for six OECD countries, although the ‘hurts’ effect seems to be substantively smaller in our Swiss case compared to the average six-country sample.

Next, we turn to the question whether these treatments affect respondents’ perceptions of trade. Models 2 and 3 show that the helps-treatment causes respondents to assess both the personal and the country benefits from international trade as more favorable compared to the control group. When trade is communicated to help the environment domestically and abroad, this increases the perceived personal benefits from trade by 0.36 (9 percent of the control group mean, significant at the 1 percent level). In comparison, when trade is communicated to hurt the environment domestically and abroad, this decreases perceived personal

benefits by 0.18 (4 percent of the control group mean, significant at the 10 percent level). Respondents react slightly stronger with respect to perceived country benefits from trade, where the helps-treatment increases the average response by 0.32 (7 percent of the control group mean, significant at the 1 percent level). We see a similarly strong effect of the hurts-treatment, decreasing perceived country benefits by 0.38 (8 percent of the control group mean, significant at the 1 percent level). These results are compared over countries in Nguyen, Huber, and Bernauer (2021) (see their figure 4), where they find that the difference in ego- and sociotropic effects for the hurts-treatment seems to be relatively pronounced in the Swiss case. Note also that in absolute terms respondents perceive country benefits from trade as more substantial compared to personal benefits.

The treatments, and the induced concern for the environmental impacts of trade affect attitudes toward trade more broadly. As presented in model 4, the helps-treatment causes respondents to spontaneously associate trade with a broad range of more favorable associations like opportunities, jobs, hope, wealth, or fairness. The hurts-treatment works in the opposite direction, though not at conventional levels of statistical significance for the whole index. Concerning the individual items contained in the index, effects emerge for the hurts-treatment, which causes respondents to see more ‘threats’ and assess trade as rather ‘bad’, and for the helps-treatment, causing respondents to relate trade with more ‘hope’ and ‘wealth’.¹²

Central to our argument, we now assess how these changes in perceptions play out for the political left and right. As can be seen from the marginal means by treatment status and left-right self-placement in figure 3, respondents on the political left, center, and right mostly show similar baseline evaluations of these perception questions. An exception are, the control group evaluations of trade impacts, which are substantially more negative for the political left (mean of 2.9) compared to the political center and right

¹²This dependent variable is not analyzed by Nguyen, Huber, and Bernauer (2021).

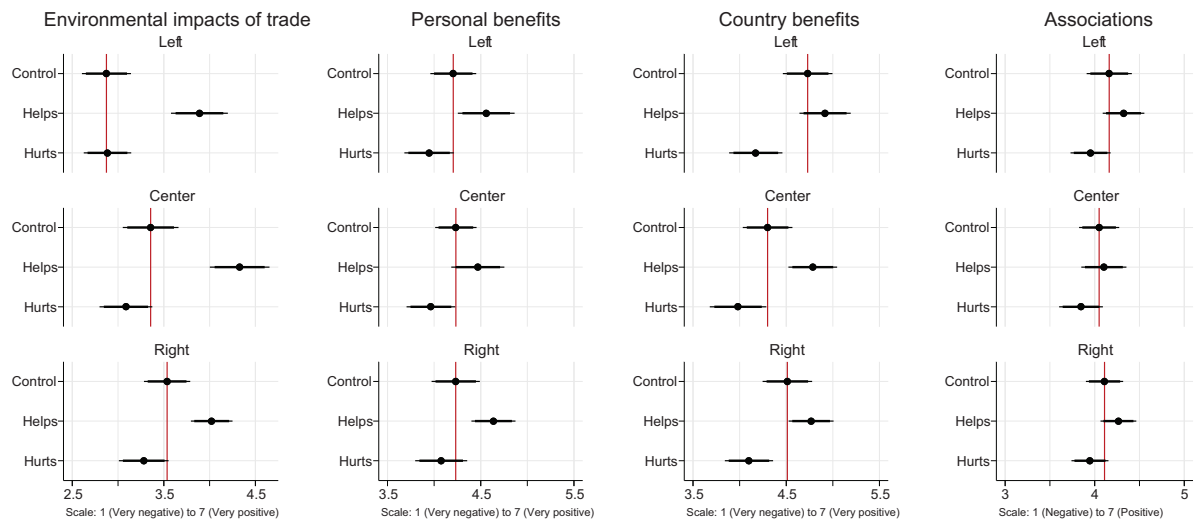


Figure 3. Average response by treatment condition for subgroups of political ideology. Panel 1: “What overall effects will international trade have on environmental protection?”; panel 2: “What do you think about the growing trade and business ties between Switzerland and other countries [for] myself and my family?”; panel 3: “... [for] Switzerland as a country?”; and panel 4: index from replies to association questions (“spontaneously”, what is “the first thing that comes to your mind when you hear about international trade?”) concerning bad–good, threat–opportunity, unemployment–jobs, fear–hope, poverty–wealth, and unfair–fair. Answer scales 1 (negative) to 7 (positive). 90 and 95 percent confidence intervals computed with robust standard errors are shown. Vertical lines indicate control-group means.

(mean of 3.5). Concerning treatment effects, the treatments work in the expected direction in all subgroups (except for the hurts-treatment in panel 1 for the political left, and not always showing significant differences, which might also be due to small subgroup sample sizes).

Now, we turn to how concern for the environmental impacts of trade affects trade policy attitudes. Control group respondents are, on average, torn between limiting or not limiting international trade to reduce negative environmental consequences, with left-leaning respondents rather for, and center- and right-leaning respondents rather against trade limits (model 5 of table 2 and left panel of figure 4). Looking at the experimental vignettes, the treatment effects are substantively small and mostly not statistically significant. The treatment communicating that trade helps the environment domestically and abroad moves respondents to disapprove trade limits by 0.18 scale points (p -value 0.11, 5 percent of the control group mean), whereas the hurts-treatment leads to respondents being more likely to approve them by 0.11 points (p -value 0.34, 3 percent of the control group mean), relative to the control group. While substantively of comparable size, these effects are significant in the six-country sample of Nguyen, Huber, and Bernauer (2021). Concerning subgroup effects, we find that respondents on the political left respond strongly to the helps-treatment, and are more likely to disagree with trade limits than (by half a scale-point, 13 percent of control group mean).

Finally, we look at replies to a categorical variable assessing a proposal to introduce import bans (model 6 of table 2 and right panel of figure 4). While results are statistically insignificant for most models, the direction of effects is insightful. Overall, we find small shifts toward preferences for free trade for the helps-treatment, and small shifts toward trade restrictions for the hurts-treatment. Again, these findings are, despite different statistical modelling, comparable to the results of Nguyen, Huber, and Bernauer (2021) for six countries. However, concerning subgroups, only those leaning toward the political left are moved by the helps-

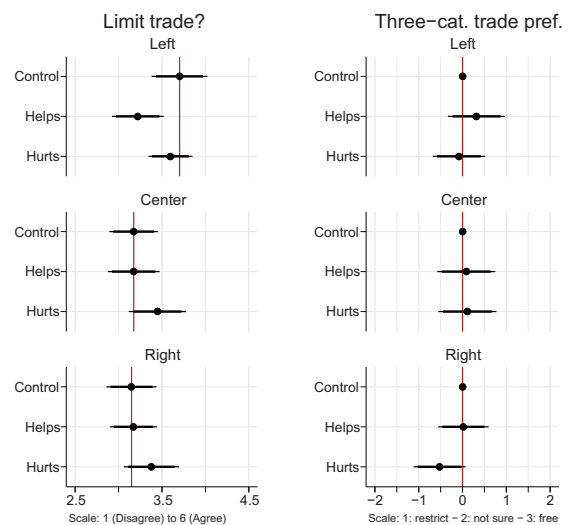


Figure 4. Response by treatment condition for subgroups of political ideology. Left panel: average reply to question “Limit international trade to reduce negative environmental consequences” (six-point scale). Right panel: coefficient from ordered logistic regression of question “Do you favor or oppose new limits on imports, or haven’t you thought much about this?”. 90 and 95 percent confidence intervals computed with robust standard errors are shown. Vertical lines indicate control-group means.

treatment (toward favoring free trade), while those leaning toward the political right are moved by the hurts-treatment (toward restricting trade). Those in the political center are unmoved by the treatments. These effects, while only significant (on the 10 percent level) for the political right, are sizable. With the helps-treatment, more than 50 percent of the respondents on the political left favor free trade. With

the hurts-treatment, less than 50 percent of respondents on the political right favor free trade.¹³

In summary, the experimental results show that information on the negative or positive environmental implications of trade affects respondents' concern for the environmental impacts of trade, both in a negative and, more so, in a positive direction. This experimentally induced variation causes a more positive perception of both personal and country benefits from trade and leads to more positive feelings toward trade when trade is communicated to help the environment, and vice versa for the hurts-treatment. We also find some tentative evidence that this affects trade policy preferences. Shifts are particularly strong for left-leaning respondents who received the helps-treatment and right-leaning respondents who received the hurts-treatment. One explanation for this finding is that such information cuts against existing beliefs of the subgroups prior to treatment. Taken together, the experiment shows that the environmental implications of trade affect trade preferences.

Online Appendix Section A.2.4 offers additional evidence for three more complex treatment vignettes. These treatments highlighted that environmental effects of trade are positive, (1) but only for the home country, (2) but only for trading partners abroad, or (3) but only for the home country with an extended explanation of footprint shifting. Of particular interest is here, whether the finding of [Nguyen, Huber, and Bernauer \(2021\)](#) that there exists no "home bias" with respect to the environmental implications of trade also holds for the political right. With these more complex and differentiated treatments, we see only a few significant changes in the evaluation of trade, its effects, or policy preferences. Notably, we find no particular home bias for right-leaning respondents—if anything, responses to whether trade limits should be imposed to reduce negative environmental consequences are more affirmative for the political center and more negative for the political left when trade 'helps only abroad'. This could indicate unexpected nonlinearities in public opinion formation by political ideology concerning a potential home bias. We return to this issue in the Discussion section.

Discussion

While political economy research on the trade–environment relationship was focused on territorial measures of pollution and other forms of environmental degradation, it generated ambiguous empirical findings, notably for the pollution-haven claim ([Spilker, Koubi, and Bernauer 2017](#)). Life-cycle analysis, which emanates from environmental sciences and engineering, has shifted our focus from territorial (production) to consumption-based environmental outcome measures ([Aklin 2016; Lutter et al. 2016](#)). With this changed focus, there is strong evidence that trade and the associated global supply chains are a large and powerful driver of environmental burden allocation in the global economy, and that there is a major international pollution-haven issue in this regard ([Wiedmann and Lenzen 2018](#)).

Such scientific findings are obviously important. Nevertheless, their policy implications hinge on attitudes and preferences of the mass public, because democratic policy-makers are very likely to act at least broadly in line with what citizens want ([Wlezien and Soroka 2007](#)),

¹³Note that [Nguyen, Huber, and Bernauer \(2021\)](#) only provide for a simple linear interaction effect of political ideology with ego- and sociotropic trade perceptions, the question whether limiting trade reduces environmental consequences and import bans, where they find no relation.

as long as preferences shift with policy ([Wlezien 2017](#)). This puts public opinion research on the trade–environment relationship on center stage. Indeed, the trade–environment relationship has become very salient in various policy-making contexts, ranging from the TTIP to Brexit and controversy over the design of environmental clauses in preferential trade agreements ([Lechner 2016; Chan and Crawford 2017; Hübner, Deman, and Balik 2017; Blümer et al. 2020](#)).

The findings we reported in this paper indicate that environmental concern and trade skepticism are causally related. They complement earlier research that has pointed in this direction ([Bechtel, Bernauer, and Meyer 2012; Nguyen and Bernauer 2015; Spilker, Bernauer, and Umaña 2018](#)). The experimental results show that an increase in concern about the environmental impacts of trade leads to a worse evaluation of trade benefits, worse feelings toward trade, and support for more restrictive trade policy (see also [Nguyen, Huber, and Bernauer \(2021\)](#), who show this for six OECD countries, including our case). However, because (A) the extent to which environmental concern can be manipulated in an experiment is limited, and (B) it relies on a quota-representative sample, the correlational evidence we use is an important complement to the experimental findings. Overall, and for nuanced subdimensions of trade policy, we find: citizens with higher degrees of environmental concern are more trade skeptic on average.

Our findings suggest that policy-makers should pay more attention to the greening of global supply chains if they wish to sustain public support for liberal international trade policy ([EC 2019](#)). Our findings are also analytically useful in terms of helping us make sense of the current backlash against economic globalization ([Naoi 2020; Mansfield, Milner, and Rudra 2021; Walter 2021](#)), increasingly elaborate environmental clauses in trade agreements ([Bastiaens and Postnikov 2020; Jinnah and Morin 2020](#)), and attempts in the private sector at greening international supply chains ([Thorlakson, de Zegher, and Lambin 2018; Bastiaens and Postnikov 2020](#)).

Further, our results show that ecologically motivated skepticism about trade liberalization resonates both on the political left and right, with some nuances concerning particular facets of trade and trade policy. Most respondents in our sample have only a limited awareness of how large their country's environmental footprint abroad is, relative to the domestic level. This could indicate that increasing public awareness of the environmental impacts that domestic consumption has abroad can lead to an even stronger effect of environmental concern on trade skepticism over the coming years (but see [Presberger et al. 2022](#)). Recent research ([Nguyen, Huber, and Bernauer 2021](#)) and our Online Appendix A.2.4 indicate that there is little home bias in how citizens perceive the trade–environment relationship—one might have suspected that particularly citizens on the political right will be less worried about offloading environmental impacts on other countries, but this is not the case.

The combination of correlational and experimental evidence implies that our results are likely to have high internal validity. Assessing to what extent our results are relevant for other countries will require additional research, and our study hopefully provides a useful template for this. It is noteworthy, however, that Swiss citizens hold very similar levels of environmental concern and perceptions of personal trade impact and trade policy preferences as citizens in other high-income countries.¹⁴ This suggests that using a

¹⁴In Online Appendix Section A.4.2, we show these similarities based on data from ISSP Research Group (2019) and [Nguyen, Huber, and Bernauer \(2021\)](#).

similar or even identical study design in other high-income democratic countries may well produce similar findings.¹⁵

Finally, the survey-experimental part of our study was not designed to clearly distinguish informational effects from framing effects (the latter “understood to mean a communicator’s selective presentation and interpretation of an issue [, the former as] argument-based persuasion”, Leeper and Slothuus 2018, p. 2). This distinction could be relevant when trying to establish the implications our research may have for how easily citizens’ attitudes could be moved by political actors (see Leeper and Slothuus 2018). We cannot ascertain directly to what extent respondents take up the survey-experimental treatments as emphasis of pieces of information they already have in mind or of new information. Given low levels of knowledge on the allocation of environmental footprints of Swiss consumption, it is likely that at least a relevant part of the treatment affects study participants through information provision and its subsequent effect on the cognitive dimension of environmental concern. However, future research could investigate to what extent survey-experimental treatments on the environmental consequences of trade only affect the weights with which different pieces of information that citizens already possess enter the attitude or preference formation calculus, or to what extent they affect information levels as such. To this end, surveys (ideally in panel format) that assess information levels and trade attitudes at one point in time, provide factual information, and then reassess trade attitudes at a later point in time could be useful.

As of now, there is only little research on the trade–environment nexus from a public opinion perspective. We hope that our research encourages similar studies in other countries, which will be important for assessing the relevance of our arguments and findings in other cultural and political contexts.

Supplementary Information

The replication code and data underlying this article are available in the *International Studies Quarterly* data archive, at <https://dataverse.harvard.edu/dataverse/isq>.

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Conflict of Interest Statement

The Authors declare that there is no conflict of interest.

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¹⁵Nguyen, Huber, and Bernauer (2021) show that this seems to be at least the case concerning the aggregate-level survey-experimental results for selected OECD countries.

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