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Does international “offshoring” of environmental impacts reflect consumer NIMBYism?^{*†}

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Abstract

Consumption of imported goods whose production affects the natural environment abroad implies international “insourcing” of consumer benefits and “outsourcing” of environmental impacts. We examine to what extent consumer choices driving such ecological outsourcing in the aggregate, often from the Global North to the Global South, are motivated by environmental NIMBY (not in my backyard) preferences. The analysis relies on an original survey-embedded choice experiment in three large, high-income economies (Germany, Japan, United States, total N=7,494). We find considerable support for environmental NIMBYism in consumer decisions. Whereas consumers generally tend to prefer domestically sourced products, this home bias becomes weaker with increasing environmental impacts of production. One important implication of this finding is that policy makers should address potential unintended side-effects of more stringent eco-labeling requirements. The latter may in fact contribute to further ecological outsourcing by making both information on environmental impacts and product provenance more explicit.

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1 Introduction

Various studies on the trade-environment nexus demonstrate that, from a country-level perspective, the liberalization of international trade has, over the past few decades, contributed to a major re-allocation of environmental impacts of consumption (e.g., air and water pollution, carbon dioxide emissions, deforestation) from higher- to lower-income countries (Kolcava et al., 2019; Peters et al., 2011; Wiedmann et al., 2020). This implies that high-income countries in the Global North can “have the cake and eat it, too”, in the sense of being able to improve environmental conditions on their respective territory (at home) in line with the logic of the Environmental Kuznets curve (Al-Mulali et al., 2015), while allowing for domestic consumption that exceeds domestic ecological resources by far and harms the environment abroad (Hickel, 2020).

Policy makers in high-income countries with high levels of consumption of imported foreign goods whose production harms the natural environment abroad typically encounter strong political and economic limitations in trying to motivate producing countries to mitigate environmental impacts of production. The reason is, quite simply, that it is largely up to individual countries to decide on national or local environmental laws and regulations. Moreover, many governments, and particularly those in lower-income countries, often tend to prioritize jobs and economic growth over environmental protection (Ruoff, 2009).

Efforts to coordinate and harmonize environmental standards for traded goods at the international or even global level commonly have, thus far, resulted in lowest-common-denominator solutions (McCormick, 2006; Susskind & Ali, 2014; Young, 2015). High-income countries are thus increasingly addressing the problem of ecological outsourcing by encouraging companies to adopt voluntary supply chain measures and informational means, notably eco-labels (Ven, 2019).

Yet, effectively reducing environmental impact “offshoring” through eco-labels requires that consumers are, all else equal, indifferent to whether the environmental footprint of consumer goods accrues at home or abroad. That is, when choosing between two equivalent products, consumers should care about quality, price, and where the product is produced. But they should be equally concerned or unconcerned about whether the environmental impacts of production materialize, depending on whether the choice falls on a domestic

or imported product, at home or abroad. If environmental NIMBYism plays a role, however, consumers will prefer, all else equal, imported over domestic products as environmental impacts of production increase.

Various studies have mapped the flows of environmental impacts embodied in international trade (Kanemoto et al., 2016; Lenzen et al., 2012; Wiedmann & Lenzen, 2018). Yet other studies have sought to identify the structural drivers of international environmental impact shifting, e.g. in terms of the cost of labor, foreign direct investment, and resource abundance (Danish et al., 2020; Zafar et al., 2019). While existing research on consumer behavior does not directly address the question of interest here, it provides a useful starting point. Specifically, explanations on consumer preference formation in favor of domestic versus foreign products (called ‘home bias’) (Morey, 2016; Obstfeld & Rogoff, 2000) can help in understanding the “insourcing” of environmental impacts, e.g. with reference to (presumed or real) lower product quality of foreign products (Davidson et al., 2003) or human rights violations in countries from which goods are imported (Dickson, 2001; Sandıkçı & Ekici, 2009; Scruggs et al., 2011). Explanations of the home bias by itself do not shed light on the offshoring of environmental impacts though.

The political economy literature on NIMBY problems explains why people dislike and at times take political action against environmentally harmful activities in close proximity, but tolerate such activities elsewhere (Carley et al., 2020; Kraft & Clary, 1991; van der Horst, 2007). Following this argument, we should expect consumers to favor imported goods if producing such goods is highly polluting. That is, we should expect more environmental offshoring. How the home-bias and environmental NIMBY considerations jointly influence consumer preferences remains largely unknown, and the research presented here is, to the best of our knowledge, the first study on this issue.

Specifically, we argue that, to the extent there is environmental NIMBYism in consumer choices, the home bias in such choices is likely to decrease when the environmental impact of production increases and consumers prioritize environmental protection at home, relative to abroad. The empirical analysis of this argument is based on an original online survey in three high-income countries, Germany, Japan, and the United States (total N=7,494). The key part of this survey is a conjoint choice experiment in which respondents had to choose between products that varied on price, environmental impact of production, and country of origin. The experimental data allows us to estimate the ef-

fect of product characteristics on consumer choice and willingness to pay, and whether consumers' home bias is indeed conditional on NIMBY preferences.

The empirical findings suggest that preferences for domestic products (home bias) remain strong even when the environmental impact of production is high. Yet, we also observe that the home bias decreases when the environmental impact of production increases, suggesting that environmental NIMBYism does play a role in purchasing decisions. These findings are robust to provision of information on environmental offshoring and across different product types. However, some interesting differences can be observed with respect to the three country contexts we consider.

In the next section, we develop the theoretical argument and its expected empirical implications. This is followed by a presentation of the study design, a report on the empirical findings, and a discussion of these findings and their implications.

2 Theoretical Argument and Expected Empirical Implications

In constructing our theoretical argument we build both on the literature in consumer & marketing research on country-of-origin effects in purchasing decisions (Davidson et al., 2003; Ortega–Egea & García–de–Frutos, 2021; Sandıkci & Ekici, 2009; Scruggs et al., 2011), and on the political economy literature focusing on individual preference formation. In particular, our argument centers on two potentially orthogonal drivers of consumer choices: A) home bias (general preference for domestic products) and B) NIMBYism (prioritizing the protection of the home country environment over the environment abroad). Our argument thus focuses on how geographical characteristics and environmental externalities co-determine consumer choices and willingness to pay.

2.1 Home Bias and NIMBYism

In general, the term 'home bias' in international trade and consumption refers to the high level in a country's consumption of domestic compared to foreign products (Anderson & van Wincoop, 2003; McCallum, 1995; Obstfeld & Rogoff, 2000). The home bias is frequently described as a puzzle because the substantial market share of domestic products in consumption cannot be

fully explained by differences in prices between domestic and foreign products. Accordingly, research on consumer behavior has developed explanations on how and why consumer preferences are influenced by provenance, such as perceptions of domestic products being of better quality (unobservable quality) (Davidson et al., 2003; Hoffmann & Gatobu, 2014; Morey, 2016), identification with and support for domestic producers and workers ('consumer ethnocentrism') (Shimp & Sharma, 1987), and higher environmental standards (García-de-Frutos & Ortega-Egea, 2015; Ortega-Egea & García-de-Frutos, 2021). Additionally, religious and other cultural factors have been argued to cause biases (animosities) against foreign products, unconditioned by price and quality (Munjal, 2014). However, despite much evidence supporting the notion of a home bias in consumer decisions we observe less 'insourcing' and more offshoring of environmental impacts at the macro-level (Aklin, 2016; Aşıcı & Acar, 2016).

Not-in-my-backyard preferences and behavior (NIMBYism), in turn, imply that individuals seek to avoid and often actively oppose (environmental) externalities of production in their geographical proximity. Research on environmental NIMBYism has focused mainly on domestic conflicts in situations where public goods provision imposes local costs at provision sites (and benefits to society overall). Prominent examples are conflicts over waste disposal, wind turbines, water reservoirs and dams, and mobile communication antennas (Carley et al., 2020; Kraft & Clary, 1991; Rudolph et al., 2022; van der Horst, 2007). Opposition, in this context, is usually motivated by demand for local environmental public goods. Such public goods can be of 'use value' or 'non-use value' (Liebe et al., 2011, p. 109), depending on how much individuals make use of the respective public good and/or support public goods provision in general. The main argument in the NIMBY literature has it that NIMBYism decreases with increasing geographic distance between a provision (production) site and the individual's place of residence – commonly called the distance decay effect (Devine-Wright, 2005; van der Horst, 2007). For public goods with a high 'use value' (e.g., groundwater) the decay effect is more pronounced (van der Horst, 2007). In addition to geographical distance, various studies argue that psychological distance (Clarke et al., 2016; Craig et al., 2019; Trope & Liberman, 2010) based on differing political and social identities and related symbolic boundaries (Dokshin, 2016; Lober & Green, 1994; Michaud et al., 2008), such as national borders, also influences NIMBYism

(Galak et al., 2007).

2.2 Trade-Off Between Home Bias and NIMBYism in Purchasing Decisions

Theoretically, there appears to be a tension between the home bias and environmental NIMBYism, which is important to explore empirically. This potential tension may arise because, all else equal, prioritizing domestically produced goods over imported goods, results in consumption benefits. At the same time, it also implies that environmental impacts of producing such goods are ‘insourced’ by the consuming society. Our empirical research thus focuses on how consumers resolve this potential trade-off in purchasing decisions.

Generally, consumers tend to form preferences and decide based on several criteria. For reasons of parsimony, we focus on the following. All else equal, and most trivially, the willingness to purchase a product tends to decrease with increasing price. Moreover, consumers tend towards domestically produced products because they want to support the national or local economy (sociotropic considerations) (Mansfield & Mutz, 2009; Shimp & Sharma, 1987) or because they associate domestic products with higher quality (Acharya & Elliott, 2003; Morey, 2016) – hence the home bias discussed above. Finally, when consumers take into account the environmental impact of a product, they tend to choose the product that is least environmentally harmful because this is likely to make them feel better about their purchasing decision in general (Andreoni, 1990; Tezer & Bodur, 2020).

Joint consideration of the aforementioned three factors raises the question of whether and how NIMBY preferences influence the home bias if consumers link environmental impacts to the place of production. We hypothesize that consumers experience a stronger ‘warm glow’ (Taufik et al., 2015) when they buy environmentally friendly domestic goods compared to foreign products because it may help the domestic economy without harming the local environment. In contrast, to the extent NIMBYism plays a role, the preference for domestic goods is likely to become weaker with increasing environmental impacts of those goods. In other words, we expect the home bias to decrease or increase according to the environmental impact of production.

H₁: *When the environmental impact of a product increases, the home bias (preference towards domestic products) decreases.*

Furthermore, following the distance decay effect argument and the decreasing 'use value', we expect that the effect highlighted in H1 becomes more pronounced the further away the place of production of an environmentally harmful good is. With respect to psychological distance, we expect that the willingness to offload environmental impacts of production to neighboring countries varies also according to the cultural distance between the home country and the producing country – e.g., differences between Japan and Germany offloading onto their neighbors.

Connecting the home bias and NIMBY arguments to product prices, we can derive an empirically observable implication concerning how the balance between home bias and NIMBYism will affect the willingness to pay for a product. Home bias means that the willingness to pay for domestic goods is higher than for foreign products. NIMBYism means that the willingness to pay for avoiding environmental damage at home (safeguarding high domestic environmental quality) is higher than the willingness to pay for avoiding environmental damage abroad. If, however, NIMBYism reduces the home bias, we should expect that the willingness to pay for domestic products, relative to foreign products, decreases with an increase in their environmental impact.

H₂: *The willingness-to-pay for domestic products, relative to foreign products, decreases with an increase in their environmental impact.*

In summary, we hypothesize that environmental impacts of production, alongside other factors, influence purchasing decisions and create a potential dilemma between the home bias and environmental protection. How pronounced this dilemma is, and whether the home bias or NIMBYism prevails, cannot be determined theoretically, but requires empirical research. In the next section we present our experimental study design for this purpose, before reporting and discussing the findings.

3 Study Design

To test our hypotheses, we fielded an original online survey in November 2021¹ in three high-income countries: Germany, Japan, and the United States (total N=7,494). These three high-income countries are, besides China and the

¹The survey was fielded from the 11th of November to the 7th of December.

European Union as a whole, the largest economies in the world and absorb around 23% of global imports (World Trade Organization, 2022). They differ with respect to a wide set of political, economic, social, and cultural characteristics. We thus follow a most different case logic, in the sense of focusing on different countries in order to probe the external validity of our findings. That is, we are interested in assessing how similar or different our findings are across different countries, without a pre-specified theory on whether and how environmental NIMBYism should vary across countries.

Samples for our survey experiment were drawn from the voting population of the three countries using Dynata’s online panel (formerly, Survey Sampling International (SSI) and Research Now). The three samples are representative of age, gender, and education (for more details, see Appendix A.1.1). The survey contained two attention checks and a check on minimum survey time (45% of the median survey duration) of which two had to be passed to be recorded as a completed interview (120 respondent were excluded based on these criteria; for more details, see Appendix A.1.1)). The survey was fielded in English, German, and Japanese. The survey design and questionnaire were pre-registered in the Open Science Framework Registry (Presberger et al., 2021) and were approved by the ETH Ethics Committee (EK-2021-161-R).

3.1 Choice Experiment

To examine consumer choices and willingness to pay for products as a function of attributes (explanatory variables) set forth in our hypotheses above, we employed a conjoint choice experiment (Hainmueller et al., 2014). In this experiment, respondents compared two different product profiles in six iterations and, in each round, were asked to select one of the two products. Additionally, they were asked to rate the products in rounds 4 to 6 – in this rating task they were asked to allocate from one to seven stars to products. The different steps of the choice experiment are illustrated in Figure 1.

The product profiles were randomly varied on three attributes (the explanatory variables in our hypotheses): the environmental impact of production (5 levels, from ‘very low’ to ‘very high’), the place of production (4 levels, measuring the home bias), and the price (9 price levels, measuring the willingness to pay). All attributes and their levels (potential values the variable can take) are listed in Table 1. The order of the three attributes was randomly allocated

per study participant, and was then held constant across the six iterations in order to limit complexity and allow respondents to systematically compare products.

To create a common informational baseline for all respondents about what each attribute means, respondents were provided with an introductory text that explained the attributes. In the introductory text on the environmental impact of production we explained that the attribute is neither associated with impacts of transport nor conditioned by provenance to prevent respondents linking other properties to the attribute. The introductory text also illustrated the choice task (an example for laundry detergents from the US survey is shown in Appendix Figures 6 & 7), which featured randomly assigned pictures, places of origin, and prices to avoid priming of respondents.

Respondents completed the six choice tasks for two different products (3 choice tasks per product). The two products were sampled randomly from a set of five different product types: a drinking glass, a box of paper, potatoes, a laundry detergent, and a shelf. We selected the five product types on the grounds that i) they could be produced both in our study countries and in various overseas locations (which is a necessary condition for being able to test our argument) and ii) on the basis that the products vary with respect to the importance of design and quality features (e.g., shelves showing larger variation with respect to design effects and potatoes varying with respect to perceived health effects). The products also differ in their price ranges, with potatoes at the lower end of the price range and shelves at the upper end. Prices for the products were placed around average prices of the products in the respective country to make choice tasks realistic and enable meaningful comparison through proper representation of expensive and inexpensive product choices. Again, exposing study participants to choices in the context of different consumer products follows a logic of a most different case design. That is, we seek to assess how similar or different our findings are with respect to different products, but do not have a theory-based expectation about potential differences in findings across the five product types.

Before the first and the fourth choice task, we showed respondents a random picture of the product they were assigned for the respective choice task and asked them to imagine a real-world purchasing situation in which they encountered two products resembling the presented picture. All pictures were modified to not include brand names and indications of the products' environ-

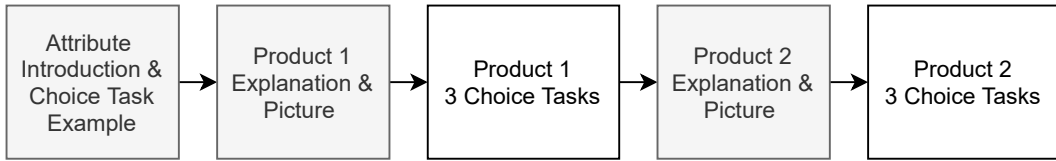


Figure 1: Flowchart of the Choice Experiment.

Attributes	Values
Price	1 - 9 price categories (prices differ according to product and country)
Place of Production	<ul style="list-style-type: none"> • <i>home country (home state/region)</i> • <i>home country (other state/region)</i> • <i>foreign country (neighboring)</i> • <i>foreign country (rest of the world)</i>
Environmental Impact	<i>very high - very low</i> (5 categories)

Table 1: Conjoint Attributes and Values. Home state/region refers to respondents’ home state/region. Other state/region refers to a random state/region other than respondents’ home state/region.

mental impact. However, we did not insert pictures in the choice task tables as such in order to minimize potential effects of design on the product choice.

The data from our conjoint experiment consists of 89916 observations from a total of 44958 choices. We analyze the conjoint data by estimating the differences in marginal means with algorithms included in the *cregg* R package (Leeper et al., 2020). We regard marginal means as more informative than average marginal component effects (AMCE) as they provide information both on the absolute share of individuals selecting a particular product with particular properties and the effects of specific attributes on product choice (AMCEs provide information only on the latter aspect). To assess the willingness-to-pay of respondents we employ a mixed (or random parameters) logit model. The algorithms to calculate the mixed logit model are taken from the *mlogit* R-package (Croissant, 2020). To calculate the values for the willingness-to-pay in local currency we first divided all coefficients by the price coefficient to obtain the change in price points and later multiplied the price points by the delta between product prices for each price point (e.g., multiplied by 1 if price points are measured in a sequence of 1€, 2€, 3€ or multiplied by 2 if price points are measured in a sequence of 5€, 7€, 9€ etc.).

3.2 Additional Evidence on Potential Reasons for Choices, and Robustness Checks

To obtain more information on why respondents might prefer domestic or foreign products we used additional survey items. For instance, we asked respondents whether they believe that domestic products are of higher quality, whether they prefer to support domestic economic growth by buying domestic goods, and whether they think that domestic products are made in more environmentally friendly ways. We base some of these survey items on country and regional attachment on items of the International Social Survey Programme (ISSP) and items on globalization on items from the established CETSCALE (Shimp & Sharma, 1987). The items are placed after the conjoint experiment in the survey. Since conjoint experiments treat respondents in many different, and randomly varied ways, a particular post-treatment bias is highly unlikely.

We used several items in the survey to assess the robustness of respondent preferences. First, recent research suggests that consumers have very limited knowledge of where, geographically, the environmental impacts of their consumption materialize and often underestimate the impact of domestic consumption abroad (Presberger et al., 2022; Rudolph et al., 2022). Hence, to control for knowledge effects we included an informational vignette experiment (before the conjoint experiment) in which the treatment group received a text and graph illustrating the impact of domestic consumption abroad. The control group did not receive any additional information. Thus, the vignette experiment serves to assess whether availability of information about the environmental impact of consumption abroad could affect respondents' consumption choices. The treatment text and graph are shown in Appendix Figure 8. Second, we randomly assigned a battery of questions on general environmental attitudes either before or after the conjoint experiment since asking respondents for their environmental attitudes early in the survey could anchor them to prefer more environmentally friendly products.

4 Results

We first discuss the overall effect of product characteristics on consumer choices. In a second step, we analyze the interplay of the home bias and the environmental impact of products and evaluate to what extent consumers' product

perceptions are affected by product provenance. Next, we quantify the variation in consumers' willingness to pay for domestic and overseas environmental quality and report on our robustness checks.

4.1 Home Bias vs. NIMBYism in Product Choices

Figure 2 depicts predicted choice probabilities for different attribute combinations – “product packages” put simply. From the upper-right corner (products with very low environmental impact, produced in the country of the respondent, low price) to the bottom-left (products with very high environmental impact, produced in a non-neighboring country, high price) the expected decrease in the likelihood to choose a product with the respective characteristics is observable. The higher the environmental impact, the higher the price, and the more remote the place of production the less likely the product is chosen. Products originating in the country of the respondent that have a very low environmental impact and very low price are chosen with a probability of almost 90% whereas products with a very high impact, produced abroad, and very high price are chosen only by around 10%. Furthermore, we observe a gap between products produced at home and those imported from abroad. Figure 2 further indicates that the spread between domestic and foreign products is smaller in the lower than in the upper panels – indicating a decrease in home bias as products' environmental impact of production increases.

In Appendix Figure 9 we plotted the overall distribution of marginal means for all attributes by country. In sum, we find that price levels have – according to their dispersion – the largest effect on product choice. Environmental impact appears to be the second most important predictor for product choice, whereas place of origin has the smallest effect on product choice when all attributes are assessed separately.

In view of our theoretical arguments above, we expect that with an increase in environmental impact, consumers will be less likely to favor domestically produced goods over those produced abroad (decrease in the home bias). In Figure 3 we display changes in the home bias as a function of the environmental impact of production by illustrating the differences in the marginal means by place of origin at all levels of environmental impact. We observe that with an increase in the environmental impact from very low to very high the delta between choosing a domestically-produced and a foreign-produced good

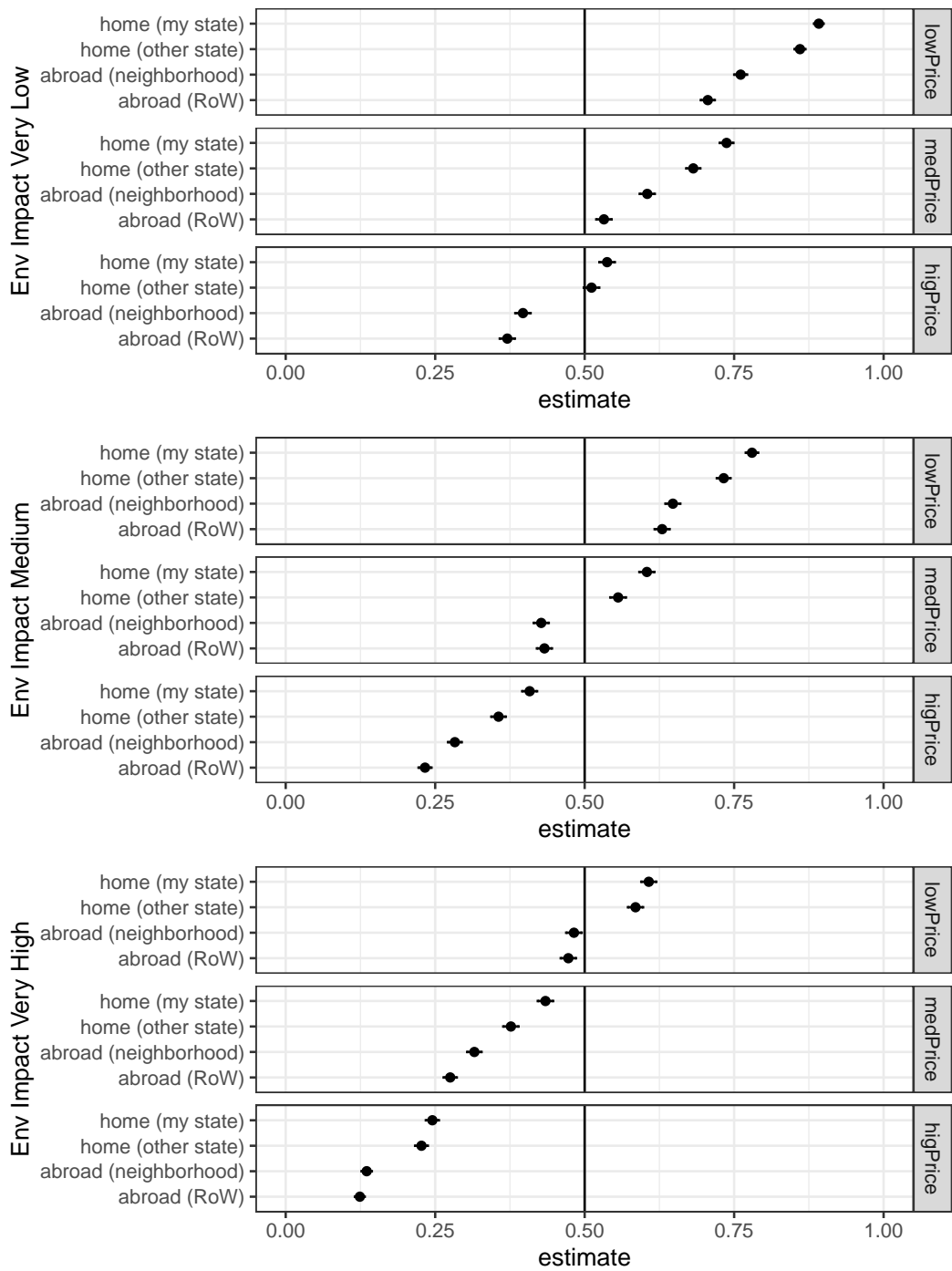


Figure 2: Predicted probabilities for attribute combinations. Three main panels grouped by environmental impact (title on the left). Sub-panels are three price levels (low, medium, and high) with place on production on the y-axis on the left.

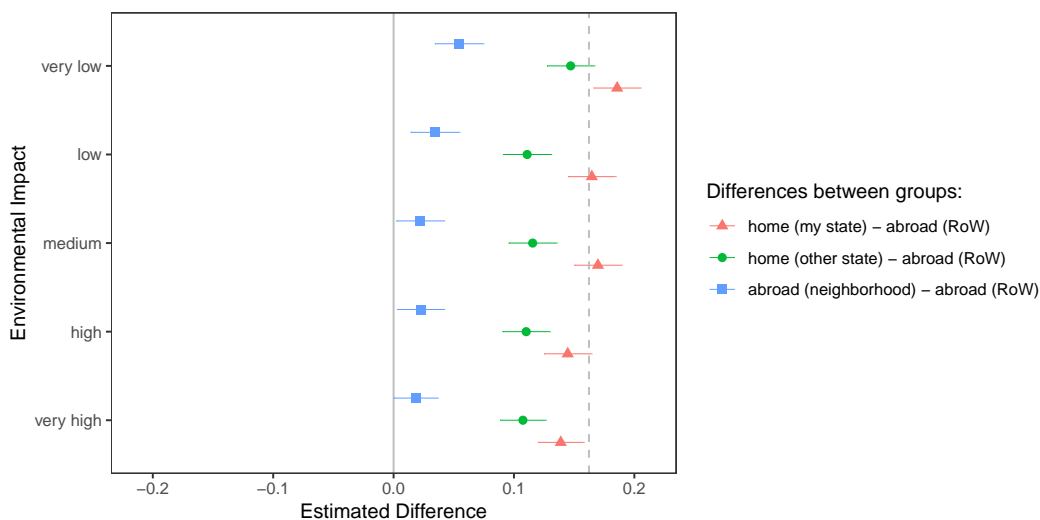


Figure 3: Differences in marginal means by environmental impact. Error bars show 95 percent confidence intervals. The grey dashed line is the mean of the very low and very high impact means for the group of the strong home bias (home (my state) - abroad (RoW)) and indicates that confidence intervals between very low and very high environmental impact do not overlap.

decreases. To favor a regional over a foreign product decreases by around 5 percentage points when the environmental impact increases from very low to very high (group with triangle shapes), which we interpret as a decrease in the home bias due to the products' environmental impact. In other words, consumers become less likely to prefer domestically produced goods over foreign-produced goods when the environmental impact is high. Substantially, the differences between the means for very low and very high environmental impacts in the strong home bias group of Figure 3 suggest that the home bias decreases by around 5%. Thus, when conferring this number onto the total consumption of a country, we expect that around 5% of goods are imported due to the potential environmental impact their production would cause at home.

In brief, we find that consumers prefer domestically produced goods over goods produced abroad, even when the environmental impact at the place of production is fairly high. However, at high levels of environmental impact consumers become less willing to chose domestic over foreign products. This decrease in the home bias due to increasing levels of environmental impact of production corroborates our first hypothesis. Seen in context of respondents' high support for domestic compared to foreign environmental protection (Appendix Figure 12) we thus infer that NIMBYist attitudes have an effect on

consumption decisions.

4.2 Consumer Views on Domestic and Foreign Products

To better understand what factors may drive consumer preferences, we asked survey participants about their perceptions of domestic and foreign products. The overall distributions of product perceptions, depending on product provenance (Appendix Figures 10 & 11), suggest that individuals prefer domestic products for various reasons. On average, they agree with the notion that goods are produced more environmentally friendly at home than abroad, are of higher quality, and buying them supports economic growth and jobs at home. Overall, we do not observe large cross-country differences in the perceptions of domestic and foreign products, though there are some exceptions. Notably, when asked whether they would purchase goods from abroad to safeguard the environment at home (Figure 4), a majority of US respondents agreed, whereas most German and Japanese respondents did not. This suggests that the strength of international environmental NIMBYism may vary to some extent by country.

I prefer to buy products made abroad because I am concerned about the environmental impact of manufacturing products in my country.

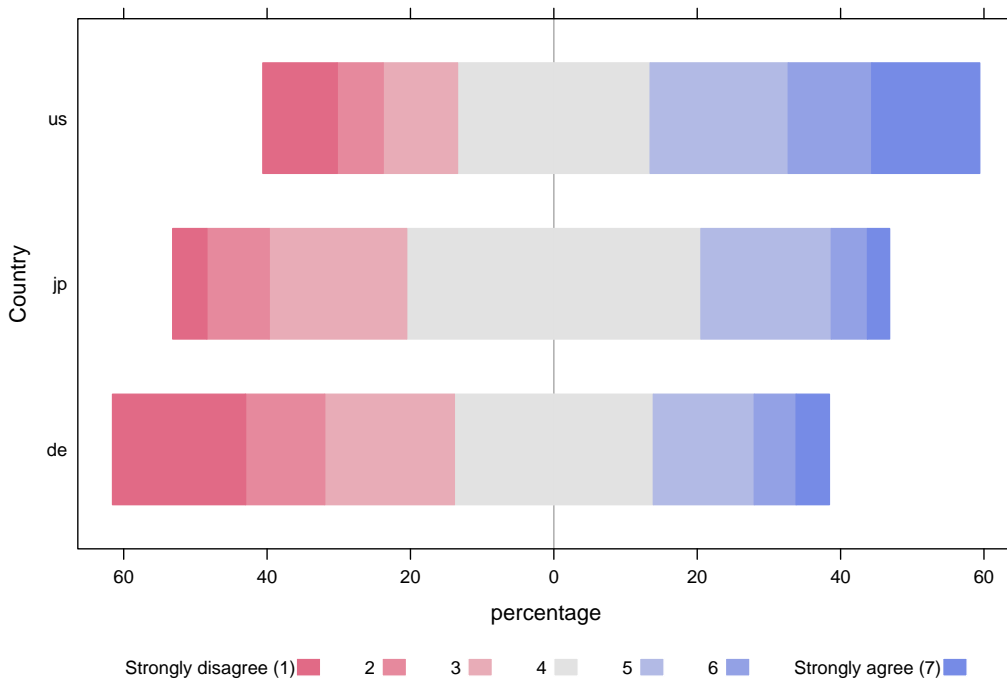


Figure 4: Preference to purchase foreign goods to safeguard the environment at home.

4.3 Willingness to Pay

Table 2 summarizes the results of a mixed logit model predicting product choice. First, we observe that a higher price, a higher environmental impact of production, and more remoteness in provenance reduce the likelihood of product choice. When calculating the odds ratios we observe that a one point increase in the price category decreases the probability of purchasing a product by 63%. For an increase in environmental impact the corresponding effect is a 67% decrease in purchasing probability. For an increase in remoteness of production the effect is 58%. The interaction effect of provenance and environmental impact is significant and positive, which again suggests that an increase in environmental impact of production dampens the negative effect of provenance distance. In other words, the home bias decreases when the environmental impact is high. This finding is illustrated in Figure 5 for the willingness-to-pay in the laundry detergent case.

	Mixed logit
Price	-0.997 (0.025)***
Env. Impact	-1.104 (0.039)***
Provenance	-0.869 (0.040)***
Env. Impact x Provenance	0.045 (0.011)***
AIC	25833.526
Log Likelihood	-12909.763
Num. obs.	29979
K	2

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 2: Mixed logit model for product choices pooled for all countries.

Dividing the coefficients shown in Table 2 by the price coefficient yields the estimated willingness-to-pay of the average consumer for a one point decrease in the respective attribute. Since we are using comparable price categories we can calculate the price points an average (pooled) consumer would be willing to pay. Accordingly, the average consumer would be willing to pay 1.11 (-0.997/-1.104 \approx 1.11) price points more for a one point decrease in environmental impact and 0.87 price points for a decrease in remoteness of the place of production.

Table 3 reports the willingness-to-pay for environmental quality and proximity by product and by country in local currencies. For this we calculated

	GER	JAP	USA		GER	JAP	USA
Glas	3.06	356	3.92	Glas	2.04	335	3.63
Paper	1.77	127	1.63	Paper	1.01	109	1.18
Detergent	2.24	168	0.90	Detergent	1.64	180	0.55
Shelf	110.95	9034	147.19	Shelf	79.38	10505	98.11
Potatoes	0.67	97	0.48	Potatoes	0.65	187	0.43

(a) Environmental Impact

(b) Provenance

Table 3: Willingness-to-pay in local currency (Germany in Euro, Japan in Yen, USA in Dollar) for one point decrease in environmental impact (a) and one point decrease in remoteness of provenance. Environmental impact was measured on a 5-point scale and remoteness of provenance on a 4-point scale.

separate mixed logit models for each country. For example, German consumers would be willing to pay 1.77€ for a one point decrease in environmental impact when buying a box of paper or 0.67€ when buying 2 kg potatoes. The corresponding value for production proximity is 1.01€ for a box of paper or 0.65€ for 2 kg of potatoes.

Calculating the willingness-to-pay for the interaction effect in Germany indicates that for a one point increase in environmental impact consumers are willing to pay 0.09 price points less (e.g., 9 cents less for a box of paper in Germany) if the remoteness of provenance is reduced by one point. We illustrate such variation in the willingness-to-pay for environmental quality in specific production locations in Figure 5 for the laundry detergent case (based on German respondents). The Figure indicates that the willingness to pay for an additional level of environmental quality abroad (non-European country) is around 70 cents lower than for an additional unit of environmental quality in their home region.

To conclude, it turns out that the willingness-to-pay for environmental quality decreases as consumers' distance to the production location increases. This finding supports our second hypothesis.

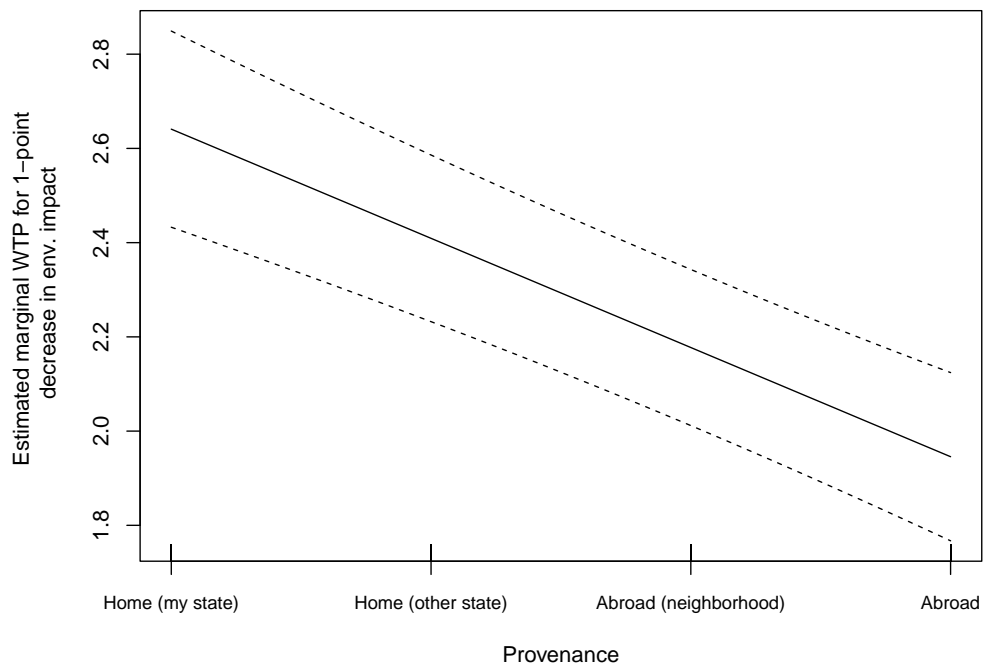


Figure 5: Marginal willingness-to-pay in the German sample for laundry detergent in Euro.

4.4 Robustness of Preferences and Differences Across Product Types

To assess the effects of potential knowledge deficits on respondents' product choices, we implemented a vignette experiment in which we provided respondents with additional information on the environmental impact of their country's consumption abroad (see Study Design). If, on average, consumer preferences are well informed or if additional information does not shape consumer preferences, we would not expect substantial differences in results as a consequence of the informational anchor. Appendix Figure 13 indicates that, indeed, additional information on the environmental impact of consumption does not affect purchasing decisions. Similarly, we report subgroup analyses based on the randomized survey order in Appendix Figure 14. Again, if respondents' preferences are sensitive to environmental information or priming, answering the environmental attitudes items before the conjoint experiment may have increased awareness for environmental problems and invoked a consistency bias leading to more environmental response behavior in the conjoint experiment. However, we do not observe such an effect. The only exception we observe is a significant increase in choosing products with a very high environmental impact when environmental attitudes are surveyed after the choice experiment, which is in line with previous findings on how consumers' adjust their purchasing decisions to attitudes (Asikis et al., 2021).

Although we find a decreasing home bias for high environmental impacts in the pooled sample, we observe some variation on this account across countries. As illustrated in Appendix Table 5, the effect is statistically significant for Germany (at the 0.1% level) and the US (at the 5% level) but only barely significant for Japan (at the 10% level). Consequently, country-specific characteristics likely affect the interplay of home bias and NIMBYism.

When comparing the results for different product types (Appendix Figure 15) we observe a somewhat stronger home bias for relatively cheap products (potatoes) than for more expensive ones (shelf). For expensive products, however, we observe a larger decrease in home bias when the environmental impact increases. Furthermore, Appendix Figure 16 indicates that respondents exhibit a relatively higher willingness-to-pay for a reduction in environmental impacts and production distance for cheaper products than for expensive products.

Finally, we observe that environmental attitudes affect how home bias and

NIMBYism interact. As illustrated in Appendix Table 6, the interaction effect (decrease in home bias) turns out to be insignificant for consumers with weaker environmental attitudes whereas an effect can be observed for respondents with stronger environmental attitudes, indicating that product choices by environmentalist individuals are noticeably shaped by NIMBYist attitudes.

5 Discussion

How can high-income countries of the Global North minimize their environmental footprint in the Global South? The selection of policy measures to address this challenge remains contested in academic and political circles. Long-standing disputes over whether well-designed trade policy can generate incentives to make international economic activity more sustainable (Morin et al., 2018) coexist with debates over corporate responsibility (e.g., by multinationals) for overseas producers' compliance with environmental standards in supply chains (Folke et al., 2019).

The prospects of current political attempts to green global supply chains via disclosure mandates for firms to rein in the offshoring of environmental burdens (Kolcava et al., 2022; Sellare et al., 2022) depend on whether filling consumers' information gaps (Hainmueller et al., 2015) will result in more pro-environmental consumer behavior. Therefore, systematic insights on individuals' decision-making in response to sustainability information are needed. In our study, we propose that individuals evaluate product-specific environmental information in connection with products' origin. Following previous studies (García-de-Frutos & Ortega-Egea, 2015; Morey, 2016; Munjal, 2014), we theorized that consumers exhibit a home bias – i.e., a preference in favor of domestic products. In extension, however, we suggested that environmental NIMBY preferences may condition the home bias. In other words, we proposed that, to the extent there is environmental NIMBYism, unfavorable environmental information should reduce consumers' home bias.

For the empirical analysis, we rely on choice experiments in which we simulated purchasing decisions for a broad variety of products with representative samples in Germany, Japan, and the United States (N=7,494). Our findings indicate that, indeed, as the environmental impact of production increases, respondents' preference towards domestically-sourced products (home bias) decreases. Nonetheless, information about high environmental production im-

pacts does not lead to a preference reversal – a net-preference in favor of overseas-sourced products. Yet, we find evidence of a rather indirect NIMBY mechanism – specifically, we observe that respondents’ willingness-to-pay for environmental quality embedded in products is lower if the corresponding improvements materialize far away. Substantially, our findings suggest that around 5% of goods might be imported from abroad due to the potential environmental impact their production would cause at home.

Our findings have interesting implications for policy makers. In particular, our findings admonish not to assume that providing additional information to consumers is likely to automatically translate into pro-environmental purchasing behavior. Quite in contrast, if consumers evaluate environmental information and product provenance jointly, mandatory information disclosure and labels could, for instance, allow consumers to more strongly discriminate between domestic and overseas environmental quality through willingness-to-pay (overseas willingness-to-pay presumably being lower). These implications speak to a growing literature arguing that transparency can be a useful tool, but in itself does not constitute a sufficient condition for increased sustainability throughout the global economy (Gardner et al., 2019). Accordingly, substantive benefits are likely to only materialize within a well-designed institutional architecture. Given our findings, we would advise policy makers to strongly engage with “visibility management” – for example, the question of how increased visibility of one feature (such as environmental impacts) can reduce or magnify the salience of another feature (Flyverbom, 2016).

Although our findings remain robust across different product types and empirical specifications, we would suggest two areas for further inquiry. First, in our study, we provided respondents with information on overarching environmental impacts of products (thereby following the idea of aggregated ecological footprints) (Wackernagel et al., 2021). Although several observers note the value of coarse or aggregated information disclosure (Godar et al., 2016), we would recommend theoretically similar additional research that examines variation between specific environmental impacts (such as deforestation, water or air pollution) more closely. Potentially, concrete environmental impacts could tease out more distinct result patterns depending on particular public goods features (e.g., in terms of geographic concentration) and respondents’ first-hand-impact familiarity.

Second, future research could revisit our theory using a revealed-preferences

experiment in a real purchasing environment. In fact, we consider our stated-choice experiment a conservative estimate of NIMBY consumer preferences because the revelation of NIMBY preferences may implicate a social desirability bias. Accordingly, similar to studies on the attitude-behavior gap, we expect that a revealed-preferences design may reveal a stronger effect of NIMBY preferences on consumer home bias (Liebe et al., 2019). Lastly, follow-up studies could investigate how citizens and consumers in developing countries evaluate and perceive environmental impacts of production, with a particular emphasis on contexts in which the consumption of environmentally harmful goods occurs outside respondent countries' borders.

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A Appendix

A.1 Study Design

A.1.1 Sampling

The age quota was 18+, representative by six age groups. The gender quota was 50% male, 50% female, crossed with age. The last quota was education measured by three categories, distribution according to education levels within the population.

The survey contained two attention checks and a check on minimum survey time (45% of the median survey duration) of which two had to be passed to be recorded as a completed interview (120 respondent failed at least two quality checks).

The survey was fielded in English, German, and Japanese. All languages correspond to the main official languages of our target countries. Translations have been implemented by the survey vendor and were checked by native speakers.

Table 4: Sample Description.

	GER (n = 2500)	USA (n = 2496)	JAP (n = 2497)
Gender			
Male	1249 (50%)	1233 (49.4%)	1236 (49.5%)
Female	1251 (50%)	1263 (50.6%)	1261 (50.5%)
Age			
18 - 24	255 (10.2%)	342 (13.7%)	234 (9.4%)
25 - 34	395 (15.8%)	482 (19.3%)	399 (16%)
35 - 44	432 (17.3%)	455 (18.2%)	494 (19.8%)
45 - 54	570 (22.8%)	480 (19.2%)	427 (17.1%)
55 - 64	455 (18.2%)	438 (17.5%)	474 (19%)
65 and older	393 (15.7%)	299 (12%)	469 (18.8%)
Education in Years			
0 - 5	67 (2.7%)	464 (18.6%)	91 (3.6%)
6 - 10	709 (28.4%)	243 (9.7%)	115 (4.6%)
11 - 15	1214 (48.6%)	1053 (42.2%)	1338 (53.6%)
16 - 20	510 (20.4%)	736 (29.5%)	953 (38.2%)
Household Income (deciles)			
1st	267 (11.5%)	350 (14.7%)	200 (9.2%)
2nd	209 (9%)	309 (13%)	159 (7.3%)
3rd	188 (8.1%)	330 (13.8%)	144 (6.6%)
4th	236 (10.2%)	272 (11.4%)	162 (7.5%)
5th	219 (9.4%)	200 (8.4%)	182 (8.4%)
6th	199 (8.6%)	234 (9.8%)	216 (10%)
7th	274 (11.8%)	217 (9.1%)	244 (11.3%)
8th	251 (10.8%)	224 (9.4%)	241 (11.1%)
9th	213 (9.2%)	177 (7.4%)	237 (10.9%)
10th	263 (11.3%)	72 (3%)	381 (17.6%)

A.1.2 Introductory Information Before Conjoint

Q9_1. Now imagine you are strolling through the aisles of a supermarket and want to buy laundry detergent and a drinking glass.

Below we will show you two offers, each for laundry detergent and a drinking glass side by side. Please tell us which of the two products you would buy.

Products differ in many ways. We are only interested in the place of production, the price, and the environmental impact at the place of production.

PAGE BREAK

Q9_3. Laundry detergent and drinking glasses can be produced domestically or abroad. The environmental impact of production can therefore be felt domestically or abroad. Regarding the **place of production**, a distinction is made between the United States (your state), United States (other state), Canada or Mexico (North America without the United States), and abroad(outside North America).

PAGE BREAK

Q9_5. The **price** of laundry detergent can range from \$5.00 to \$9.00. For a drinking glass, the price is between \$2 and \$26.

PAGE BREAK

Q9_7. The overall **environmental impact of production** (e.g., air or water pollution, deforestation, threats to biodiversity) can range from very low to very high for laundry detergent or a drinking glass. This environmental impact at the place of production is shown to you on a scale ranging from green (very low environmental impact) to red (very high environmental impact).

The following graph illustrates this:



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Figure 6: Example for the introduction text explaining the conjoint attributes for the products of laundry detergent and drinking glass.

Q9_9.

In the following table, which is intended to serve as an example, you can see two products that differ in terms of the place of production, the price, and the environmental impact at the place of production.





Product A	Product B
	
Place of production Canada or Mexico	Place of production United States (Maryland)
Price 8.00 \$	Price 6.50 \$
Environmental impact at the place of production 	Environmental impact at the place of production 
Explanation Producing the product has a very low impact on the environment in Canada or Mexico.	Explanation Producing the product has a very high impact on the environment in the United States (Maryland).

Figure 7: Example for the introduction table explaining the conjoint attributes for the products of laundry detergent and drinking glass.

Please read the following text carefully. We will ask you questions about this later.

Overall, environmental pollution within the United States (exposure of air, water, forests and soils to pollutants) has declined sharply in recent decades. This has greatly improved the state of the environment within the United States.

At the same time, however, consumption within the United States is placing an increasing burden on the environment abroad. Why?

The reason is that environmental pollution occurs primarily where products are manufactured. American consumers are increasingly buying products from abroad or products whose components were manufactured abroad. This reduces the environmental impact within the United States and increases the environmental impact abroad. Therefore, the environmental impact of consumption within the United States is shifting from the United States to abroad.

Accordingly, the environment abroad increasingly has to bear the brunt of American consumption.

The following graphic illustrates the relationship between consumption in the United States and environmental impact abroad.

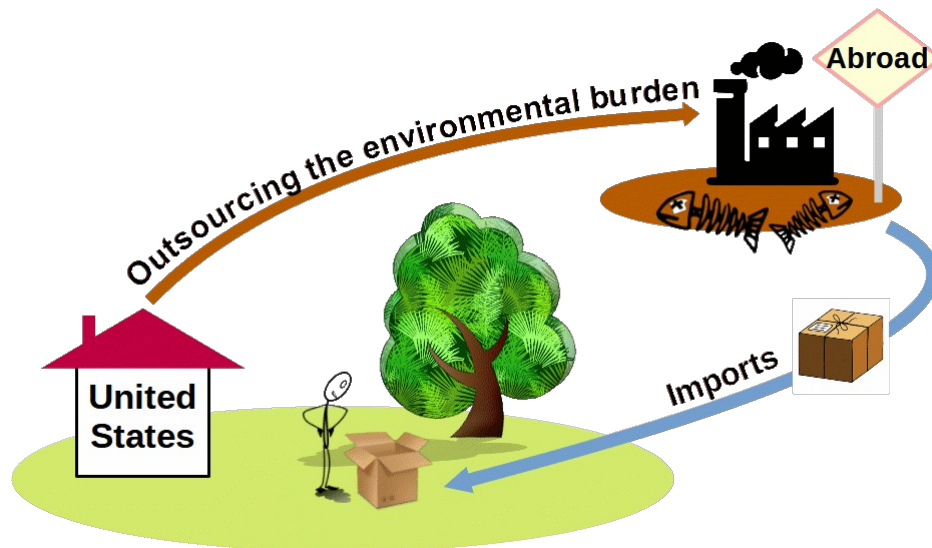


Figure 8: Text and graphical vignette for the information experiment.

A.2 Analysis

A.2.1 Product choices

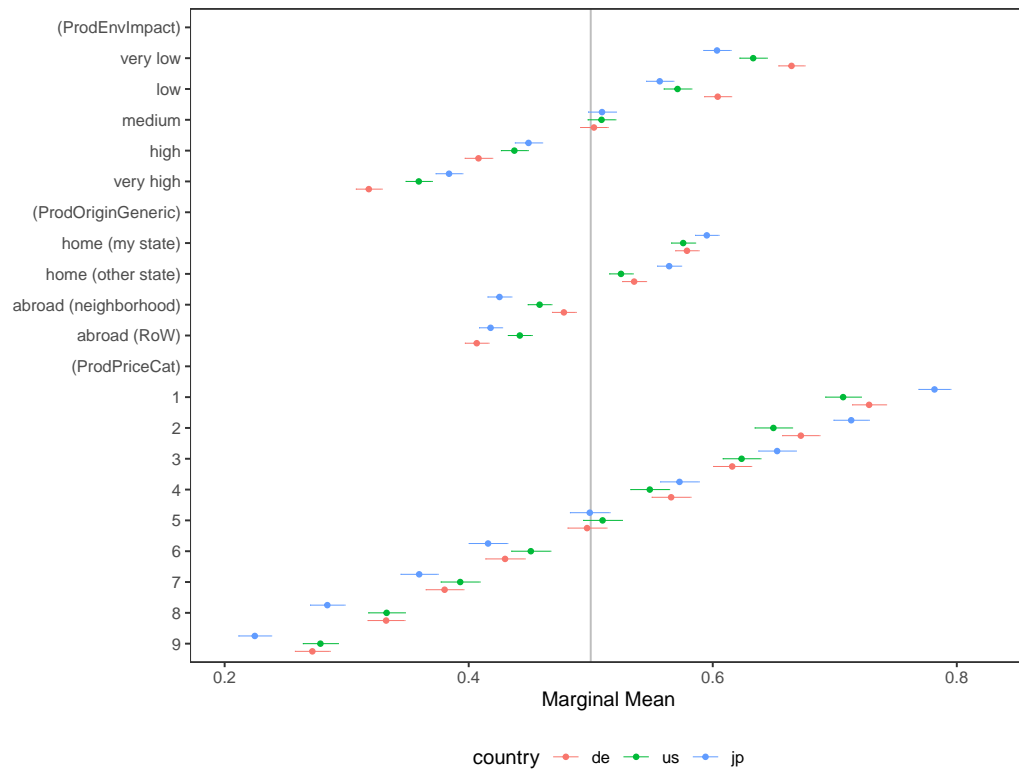


Figure 9: Overview. Marginal Means by country.

A.2.2 Purchasing intentions

I prefer to buy products made in my country because...

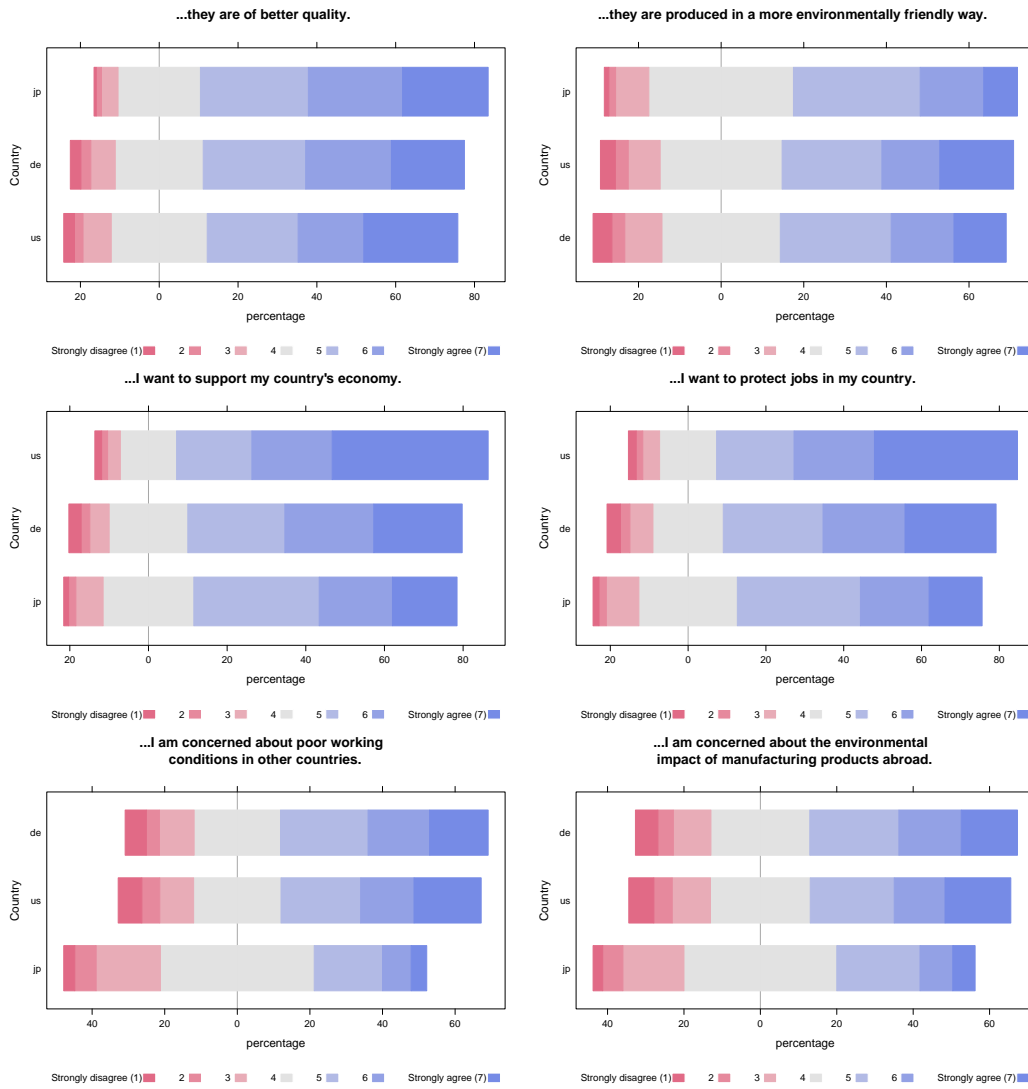


Figure 10: Intentions to purchase domestic over foreign products.

I prefer to buy products made abroad because...

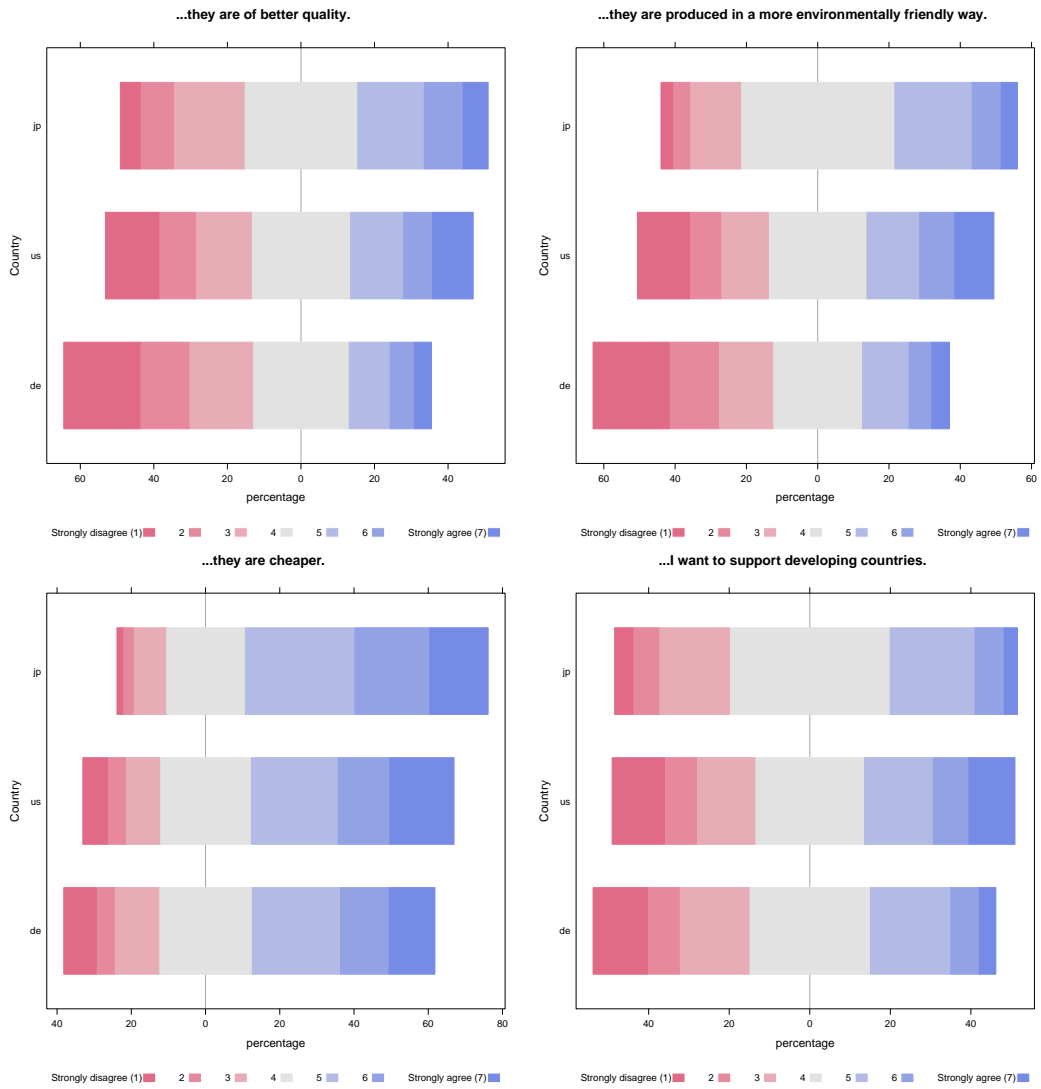
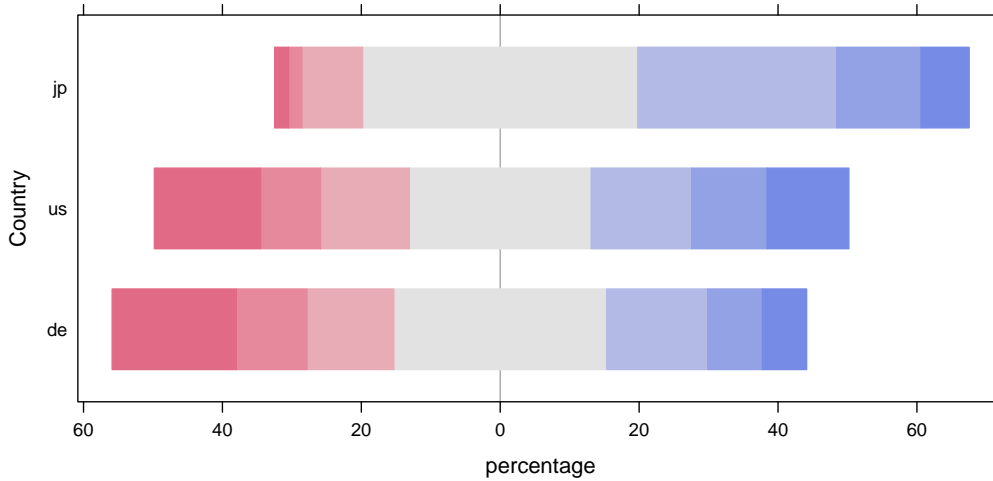


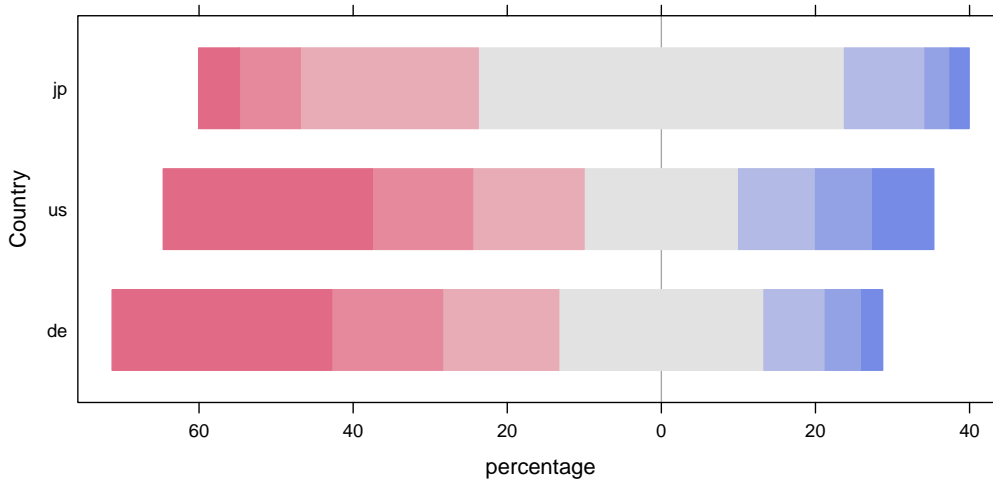
Figure 11: Intentions to purchase foreign over domestic products

Protecting the environment at home is more important to me than protecting the environment abroad.



Strongly disagree (1) 2 3 4 5 6 Strongly agree (7)

Protecting the environment abroad is more important to me than protecting the environment at home.



Strongly disagree (1) 2 3 4 5 6 Strongly agree (7)

Figure 12: Agreement on statements regarding the environmental impact at home vs abroad.

A.2.3 Experiment

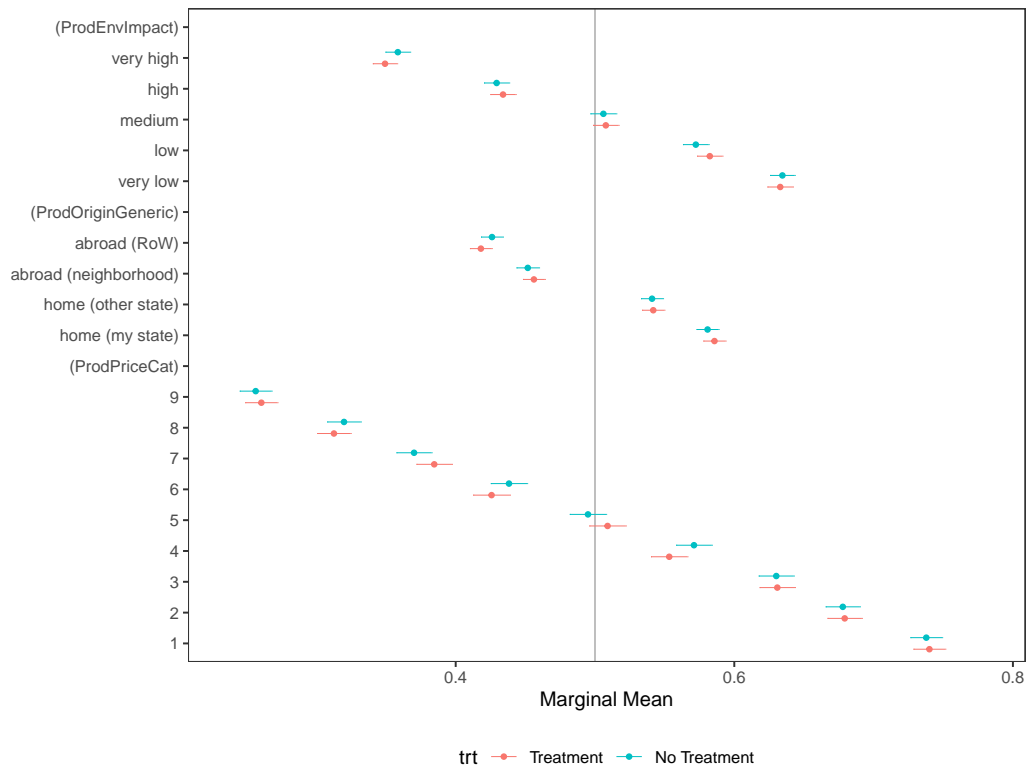


Figure 13: Experiment Text Vignette.

A.2.4 Robustness

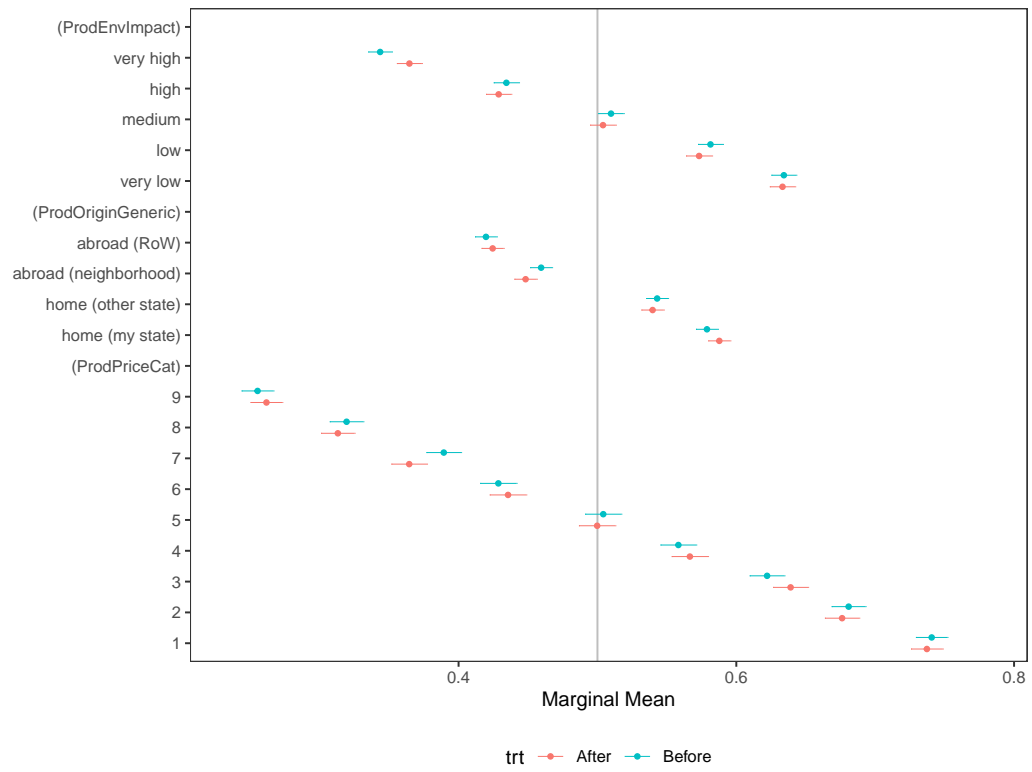


Figure 14: Experiment Environmental Attitudes Position.

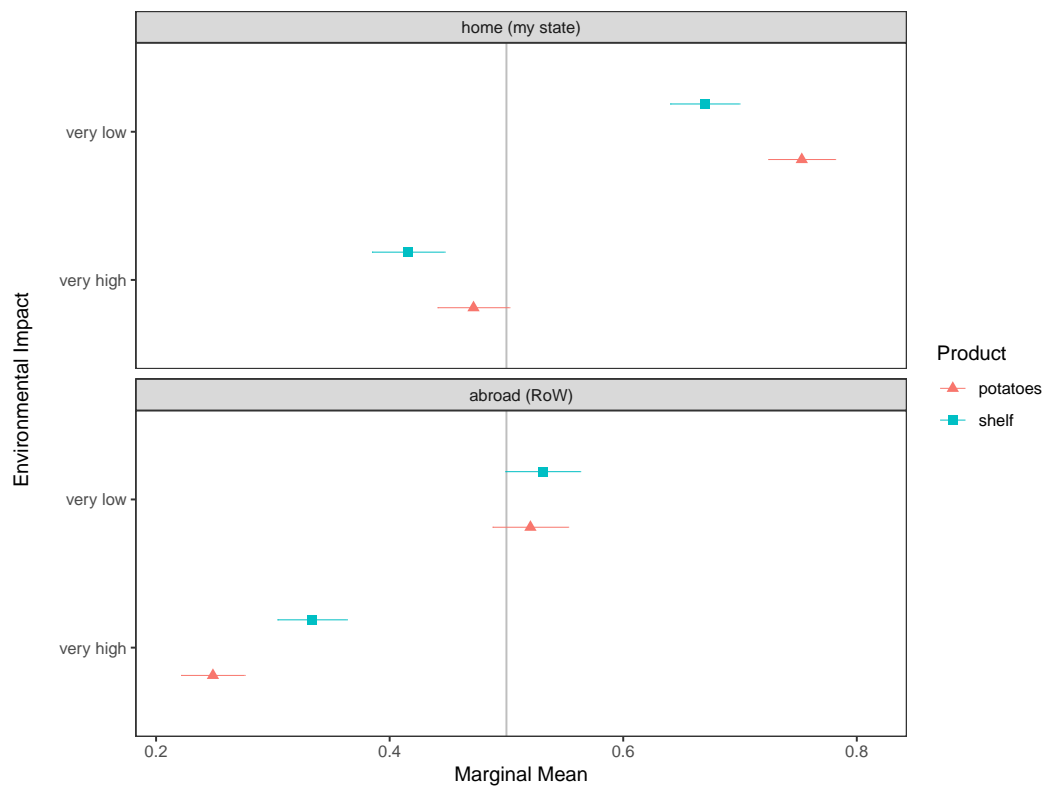


Figure 15: Differences in product types for the pooled sample. The cheapest product are potatoes and the most expensive product shelves.

A.2.5 Willingness-to-pay

	Germany	Japan	USA
Price	-0.813 (0.028)***	-1.194 (0.043)***	-0.529 (0.017)***
Env. Impact	-1.351 (0.058)***	-0.810 (0.050)***	-0.734 (0.039)***
Provenance	-0.844 (0.055)***	-0.866 (0.058)***	-0.456 (0.041)***
Env. Impact x Provenance	0.056 (0.015)***	0.028 (0.015)	0.033 (0.012)**
AIC	13107.315	12467.154	15194.818
Log Likelihood	-6546.658	-6226.577	-7590.409
Num. obs.	14997	14982	14976
K	2	2	2

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 5: Mixed logit model on product choices for all countries.

	Env. Attitudes High	Env. Attitudes Low
Price	-0.377 (0.010)***	-0.384 (0.008)***
Env. Impact	-0.737 (0.036)***	-0.340 (0.029)***
Provenance	-0.597 (0.043)***	-0.385 (0.035)***
Env. Impact x Provenance	0.047 (0.013)***	0.014 (0.010)
AIC	8152.244	11211.989
Log Likelihood	-4072.122	-5601.995
Num. obs.	8910	11100
K	2	2

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 6: Mixed logit model for product choices by environmental attitudes. Groups are the upper and lower tertile from an aggregated index of 5 questions on environmental attitudes originating from the International Social Survey Programme (ISSP Research Group, 2019).

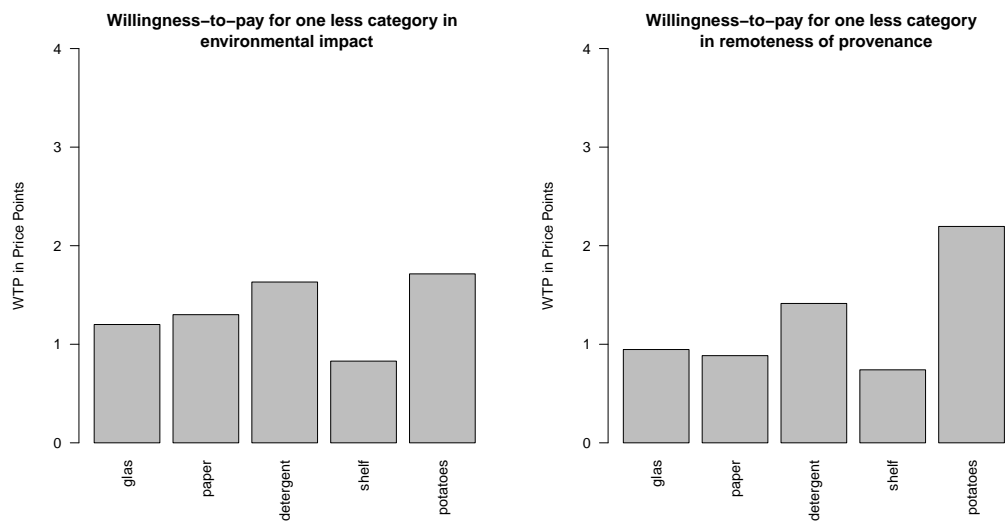


Figure 16: Willingness-to-pay in pooled sample to decrease environmental impact (left pane) or remoteness of provenance (right pane) disaggregated by respective product. Severity of environmental impact measured on a 5-point scale, remoteness of provenance measured on a 4-point scale.