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Food choice with increased visibility – A field experiment at an environmental economics conference

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ABSTRACT

Food choices and in particular meat consumption have major impacts on the local and global environment, which is why the topic is gaining attention in environmental economics and other disciplines. In this study, we investigate the effect of increased visibility on food choices, for which there has been little research to date. We present findings from a field experiment among researchers at a large environmental economics conference. When registering for the three-days conference and prior to choosing between vegan, vegetarian, or meat/fish lunches, half of the participants were informed that their choice would be visibly printed on their conference name badge. The remaining half were informed of this saliency only after their food choice (at the conference venue). Despite the conference setting in which environmentally friendly choices and signals are likely to be valued, we find no significant effect of the treatment on lunch choices. We discuss possible reasons for the null effect, including that the consequences of visibility are ignored, discounted, or already factored in.

1. Introduction

The production and consumption of meat and dairy products cause significant adverse effects for the natural environment (Godfray et al., 2018). According to recent data, the food sector is responsible for about a quarter of global greenhouse gas emissions, with large differences depending on the type of food produced. The difference in greenhouse gas emissions resulting from animal-based proteins and plant-based proteins is considerable; for example, 100 g of protein from beef produce about 113 times as much carbon dioxide equivalents as 100 g of protein from peas (Poore and Nemecek, 2018). Accordingly, reducing the consumption of animal-based products has been identified as crucial in keeping planetary boundaries (Springmann et al., 2018).

Because classic regulatory instruments, such as a carbon-based diet tax, are difficult to implement due to acceptance issues (Bonnet et al., 2020), researchers have started to investigate alternative mechanisms to foster more sustainable individual food choices. These include presenting information to consumers (Perino and Schwirplies, 2022), implementing carbon labels on food products (Muller et al., 2019), and simple nudges (Kurz, 2018). Nyborg et al. (2016) have proposed inducing a shift in social norms as a promising avenue: if less meat-intense diets become sufficiently prevalent, a new social norm may be established to which individuals adhere through mechanisms like convenience, social approval and conformism (Pizziol and Tavoni, 2024).

Food choices may lend themselves to sending a green signal because the decision is often made in the presence of other people. Special labels are used for those who completely abstain from meat or all animal products (vegetarian or vegan), which can further increase the visibility of the behavior because this information is often requested at private and business meetings with shared meals. Empirical studies from different contexts support the idea that social approval, which is made possible by making decisions observable and giving individuals the opportunity to build a reputation, can promote pro-social and pro-environmental behavior (Carattini et al., 2019; Dannenberg et al., 2024a, 2024b; Gosnell et al., 2021). For example, when their choices are made observable, people increase donations to a national park (Alpizar et al., 2008), they donate more to a climate campaign at a movie theater (Dannenberg et al., 2022), they buy fair trade coffee rather than cheaper regular coffee (Aagerup and Nilsson, 2016), they are willing to pay more for green products compared to conventional versions (Berger, 2019), and they reduce their energy consumption (Delmas and Lessem, 2014). In laboratory experiments, subjects show higher cooperation rates when

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their contributions are made visible to others after the game (e.g. Rege and Telle, 2004; Samek and Sheremeta, 2014; Christens et al., 2019).

Despite the robust findings on the promotion of pro-social and pro-environmental behavior through increased observability and the associated reputation building, the effect may depend on the specific behavior and context of choice. There is currently very little evidence for food choices, arguably because it is difficult to manipulate the observability of actual food choices, while reported food choices appear to be unreliable (e.g. Loureiro and Rahmani, 2016). Two recent experiments investigating food choices among students show that observability does not reduce meat consumption and can even increase it in some groups (Dannenberg and Weingärtner, 2023; Dannenberg et al., 2024b). The studies examining whether people adapt their food choices to the choices of others show mixed results, also suggesting that food choices are different from other behaviors and are not easily influenced by soft measures (e.g. Dannenberg et al., 2024b; Sparkman et al., 2020; Christie and Chen, 2018).

We contribute to this literature by conducting a study in a natural field setting with a subject pool that is well informed about the climate impacts of dietary choices and for whom pro-environmental behavior should be worthy of recognition, namely participants at an environmental economics conference. At the same time, this group of people is familiar with the idea of nudges to encourage certain behaviors and perhaps less easily influenced. For example, an earlier study with participants from the same conference series found that this population was little influenced by a preset default, suggesting that familiarity with such measures leads to lower effectiveness (Löfgren et al., 2012). In our experiment, we increase the visibility of food choices by printing the choice of the three lunches during the conference on the name badges that participants usually wear throughout the conference. Half of the participants were informed about this increased visibility when they registered for the conference, just before they chose their lunches. The others only learned about it upon arrival at the conference. The comparison between the two treatments shows virtually no changes in behavior, indicating that participants did not expect additional reputational gains from wearing a more sustainable name badge. We must note though that the treatment was carried out very subtly and that there was a time lag of between 1.5 and 3.5 months between selecting the lunches during the registration and the increased visibility during the conference, which might have reduced the effect. We discuss these possible reasons in the concluding section.

2. Experimental design

The experiment was implemented at the 27th Annual Conference of the European Association of Environmental and Resource Economists, which took place from 28 June to 1 July 2022 (EAERE22) in Rimini, Italy. The intervention and lunch selection took place a few months earlier during the online registration for the conference from March 15 to May 15, 2022. During online registration, participants who registered for the conference were asked to indicate which type of lunch they would like to receive on each of the three conference days and could choose between a vegan, a vegetarian, and a meat/fish option.

Before making the lunch choices, all participants saw the following text: "*For organizational purposes, we kindly ask you to indicate which type of lunch you would like to receive during the days of the Conference*." People in the treatment group were additionally shown the following text: "*Please note that we will show the selected colors on your conference name tag and the meal boxes to facilitate meal delivery*." Assignment to the treatment or control group was performed on a random basis. The options were presented subsequently for each day and the font was colored according to the color that was later displayed on the conference name badge. Fig. 1 shows a screenshot of the lunch choices for the control group and Fig. 2 shows an example of the conference name badge.

The blue circle stands for a vegan meal, the green circle for a vegetarian meal, and the red circle for a meat/fish meal.[1] The example shown would therefore tell the observers that the participant chose a vegetarian lunch on the first day, a meat/fish lunch on the second day, and a vegan lunch on the third day. Participants who had not received the treatment text were only informed about the design of the name badge when they arrived at the conference.

The online registration process was conducted by the conference organizers and included various other questions and information before and after the choice of the three lunches, in line with the usual procedure. The experimental intervention was designed in such a way that it was not particularly prominent in the registration process so as not to give away the research behind it, but also because that was the condition of the conference organizers. At the end of the registration process, participants indicated whether they agreed to an anonymous subset of their data being passed on to the authors of this study.[2]

A total of 735 participants registered and attended the EAERE22 conference. They selected 718 lunches for the first day and 716 for the second day and the third day, respectively. The final dataset we received from the consenting participants includes 576 lunch choices for the first day and 575 lunch choices for the second day and the third day, yielding a participation rate of approximately 80 %.[3] In addition to lunch choices for all three days, the dataset includes participants' year of birth, position, affiliation category, gender, and country of residence, as well as an index indicating the order in which participants registered for the conference, and whether they selected a carbon offsetting option for their conference attendance.

After the conference, as usual, an evaluation questionnaire was sent to all participants, who were regularly reminded to complete the questionnaire before September 15, 2022. We added several questions to this questionnaire that provided us with further information on how participants perceived the experiment and the delivery of lunch during the conference. We received the full data set of the questionnaire as it was conducted anonymously. However, this also means that we cannot compare the answers from the questionnaire with the decisions from the experiment and can only use them as an additional data source for

[1] The distinction between vegan, vegetarian, and meat/fish lunch options was made by the conference organizers, and the lunch buffets offered at the conference also differed in these three categories. These three categories differ on average in terms of their climate impact which made them suitable for our study. There are, of course, some differences in carbon footprint within those categories (some vegetarian dishes could be more harmful to the climate than certain meat or fish alternatives), but it was not possible to make a finer distinction.

[2] The consent statement read as follows: 'You consent the transfer of an anonymized subset of your data to allow the carrying out of research activities on economically and socially relevant behaviors. Information on the method of treatment, benefits and potential risks, data retention period, and on the Data Controller for the experiment is available *here*.' In principle, it was possible, after reading this statement, to go back and change previously provided information, but this would not change the application of the treatment. Some participants may have expected an experiment even before the statement was made, because there had been at least one previous experiment in the conference series.

[3] The lunch choices of the authors of this study, who also attended the conference, are not included in the dataset as they did not consent to the use of their data during the registration process.

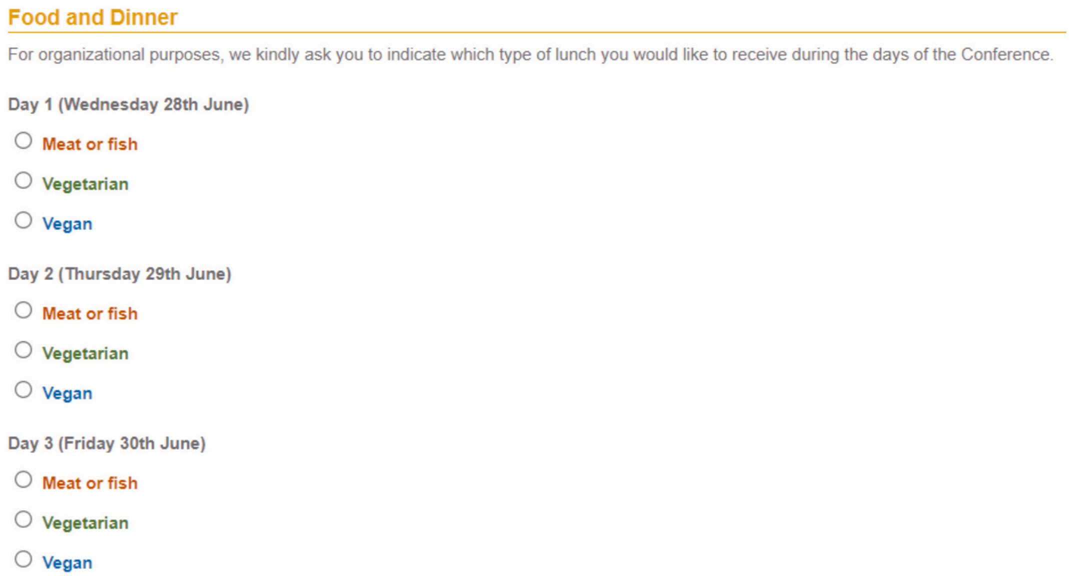

Fig. 1. Screenshot of the lunch choice during the online registration.

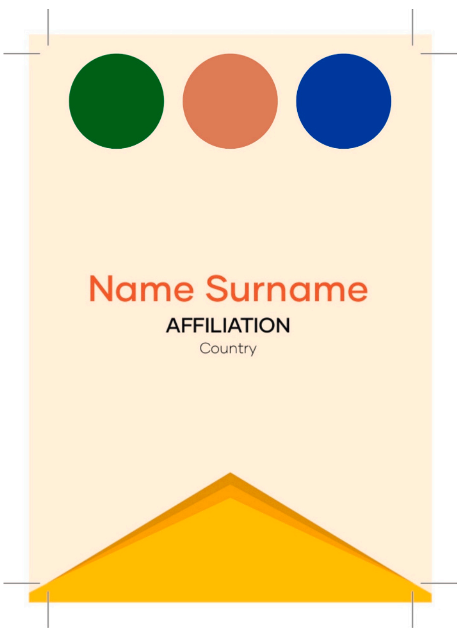

Fig. 2. Conference name badge.

aggregated perceptions.

3. Pre-registration and hypotheses

We pre-registered the study with the AEA RCT registry prior to the start of the conference and before receiving the dataset at the following link: https://www.socialscienceregistry.org/trials/9461. In the preliminary analysis plan, we specified that we will analyze individual lunch choices based on nonparametric χ^2-tests and logistic regressions with clustering of standard errors at the individual level to account for the fact that the three choices made by the same participant are not independent of each other, but reflect unobservable preferences.[4]

To derive the first hypothesis, we followed the theoretical and empirical literature which suggests that people care about their reputation and adjust their observable behavior to improve or at least not worsen their reputation (Bénabou and Tirole, 2006; Bradley et al., 2018). Although recent experiments with students have not found that observability significantly reduces meat consumption (Dannenberg and Weingärtner, 2023; Dannenberg et al., 2024b), this might be the case for the environmentally conscious population we are looking at here. The hypothesis is therefore that participants opt for a meat-free lunch more often if they know that the decision is subject to increased visibility.

Hypothesis 1. Main treatment effects
(1a) $p_T(Y = Vegan) > p_C(Y = Vegan)$
(1b) $p_T(Y = Vegetarian) > p_C(Y = Vegetarian)$
(1c) $p_T(Y = Meat) < p_C(Y = Meat)$[5]where p denotes choice probability, the index T denotes the treatment group, the index C denotes the control group, and Y denotes the outcome variable lunch choice.

Our second hypothesis relates to gender differences. We expect that women respond more strongly to the intervention than men, i.e. that the increase in meat-free lunches as a result of the treatment is greater for women than for men. This hypothesis is based on research showing that gender norms traditionally favor meat consumption in men more than in women (e.g. Ruby and Heine, 2011). The above-mentioned student experiments show that women under observation slightly reduce their choice of meat (Dannenberg and Weingärtner, 2023) and that they significantly reduce their choice of meat when observability is combined with the information that many other people eat a meat-free diet

[4] We have registered further analyses based on alternative outcome variables (e.g. count variables for the three lunch choices of each subject). We do not present these analyses since they require more complex models and the absence of treatment effects already becomes clear with the original analysis. We refer the interested reader to the Appendix, where we present additional analyses using pooled food choices.

[5] This equation differs from the one specified in the pre-analysis plan, which is due to a typo in the pre-analysis plan. As described in the text, a greater share of meatless choices in the treatment group compared to the control group requires meat choices to be less frequent in the treatment group than in the control group.

(Dannenberg et al., 2024b).

Hypothesis 2. Interaction between treatment and gender

(2a) $p_{T,F}(Y = Vegan) - p_{C,F}(Y = Vegan) > p_{T,M}(Y = Vegan) - p_{C,M}(Y = Vegan)$

(2b) $p_{T,F}(Y = Vegetarian) - p_{C,F}(Y = Vegetarian) > p_{T,M}(Y = Vegetarian) - p_{C,M}(Y = Vegetarian)$

(2c) $p_{T,F}(Y = Meat) - p_{C,F}(Y = Meat) < p_{T,M}(Y = Meat) - p_{C,M}(Y = Meat)$where p denotes choice probability, the index T denotes the treatment group, index C denotes the control group, index F denotes female participants, index M denotes male participants, and Y denotes the outcome variable lunch choice. We test these predictions by including an interaction term between the treatment variable and gender group. As the interpretation of interaction terms in nonlinear models is not straightforward (Mize, 2019), we use second differences in predicted probabilities with the "mlincom" command in Stata (Long and Freese, 2014).

Apart from gender, participants may hold other potentially conflicting identities that may either encourage or discourage meat consumption (Randers and Thøgersen, 2023). While we could not directly ask individuals to report their "food-related" identities (Monrad, 2013), we used proxy measures instead which include age, professional position, and country-level meat supply.[6] The latter relates to the prevailing social norms in the different countries of origin of the conference participants. While conference participants probably differ from the average citizen in their home countries, they may still be influenced by the norms prevailing there. To measure the descriptive social norm for meat consumption, we use the average per-capita supply quantity of meat products in 2020. This data comes from the United Nations Food and Agriculture Organization (FAO) Food Balances database (https://www.fao.org/faostat/en/#data/FBS). This database provides country-specific information on the average per-capita supply of meat products. For this purpose, we summed the country level per-capita supply volumes for all meat product categories in 2020 and merged it with our experimental dataset. The higher the average meat consumption in a country, the more likely it is that meat consumption is considered normal and socially appropriate. We therefore expect the intervention to influence participants from countries with high meat consumption less than participants from countries with lower meat consumption.[7]

4. Results

Table 1 provides an overview of the sample and the control variables that were collected during conference registration or added using the FAO data. Most of the control variables are evenly distributed across the treatments and do not differ significantly. There are significant differences in participant affiliation between the treatment group and the control group, but these disappear once we control for multiple hypothesis testing, i.e. the respective q-values are no longer statistically significant when we correct for multiple hypothesis tests.[8] We will nevertheless control for all indicated variables in the econometric analyses below.

Table 1
Sample characteristics by treatment and overall.

Variable	Control	Treatment	All	p-value
Gender				0.831
Male	0.64	0.63	0.64	0.769
Female	0.35	0.36	0.36	0.711
Other/gender-expansive or not provided	0.01	0.00	0.01	0.616
Mean age in years	40.1	39.5	39.8	0.859
Position				0.423
PhD Student	0.24	0.19	0.22	0.208
Postdoctoral Researcher	0.05	0.07	0.06	0.424
Professor	0.27	0.24	0.25	0.477
Other	0.20	0.20	0.20	0.937
Not stated	0.24	0.30	0.27	0.132
Affiliation				0.068
University	0.78	0.71	0.75	0.038
Research Institute	0.16	0.24	0.20	0.021
Company, Government or Other	0.05	0.05	0.05	0.904
Region of residence				0.248
In Europe	0.85	0.82	0.84	
Outside Europe	0.15	0.18	0.16	
Average chronological registration rank	288.5	288.5	288.5	0.999
Carbon offset choice				0.776
Chose not to offset or already	0.77	0.73	0.75	0.361
offsetting	0.20	0.23	0.21	0.386
12.50€	0.03	0.03	0.03	0.663
32€	0.01	0.01	0.01	0.728
64€				
Average per-capita meat supply quantity in 2020 in country of residence (in kg)	77.6	79.6	78.6	0.531
Number of observations	301	275	576	

Reported shares or means (in case of age, registration rank, and meat supply) by treatment and overall. *P*-values are reported for Mann-Whitney-*U* tests (age, registration rank, and meat supply) and Pearson's χ^2-tests (other variables) of independence between the respective variable and the treatment variable. For variables with more than two levels, the p-value in the first line refers to a χ^2-test of all levels and the treatment variable, while the *p*-value in all other lines refers to a χ^2-test of a dummy variable for the respective level (vs. all other levels) and the treatment variable.

The sample consists of around two thirds male participants and one third female participants. The average age is around 40 years. As the conference took place in Europe, the majority state a country in Europe as their place of residence. Of those who do not reside in Europe, about half indicate the US as their place of residence, while the remaining 48 participants indicate other countries around the world. About three quarters of respondents are affiliated with a university, 20 % work in a research institute, and the remaining 5 % work in a company, government, or other institution. When registering, participants had the option to financially support a local reforestation project to offset the carbon emissions caused by their participation. They could either contribute nothing, €12.50, €32, or €64. As the proportion of participants who opted for €32 or €64 was low, in the following analyses we only distinguish between participants who chose one of the offset options and

[6] Despite often being mediators for food-related decision-making, gender and national identity represent high-order identities which are less likely to directly influence meat consumption than behavior-specific identities, such as identifying as (anti-)vegetarian or flexitarian, hierarchically closer to behavior (Randers et al. 2023).

[7] We pre-registered and tested the interaction between the treatment and the following variables: age of participants, position/title of participants, and registration order. The interaction with the CO_2 offsetting option was not pre-registered but tested. None of these interactions with the treatment were found to be statistically significant. We also pre-registered the interactions of the treatment with being a presenter, presentation topic, and number of participants from the same institution, but we were not able to obtain anonymous data for these variables in the end, so we could not test their effect.

[8] For the correction, we apply the "qqvalue" command with the Holm method in Stata (Newson, 2011, based on Holm 1979) to the set of *p*-values summarized in Table 1 (excluding the *p*-values for the cross-level tests for variables with more than two levels, as these are also reflected in the tests for the individual variable levels).

those who did not.

Figure 3 shows the distribution of lunch choices for each of the three conference days separately for the control group and the treatment group. About half of the participants choose the meat/fish option, slightly less than half choose the vegetarian option, and less than 10 % choose the vegan option. The distribution of lunch choices is very stable both across days and treatments. Pearson's χ^2-tests show that lunch choices do not differ significantly between treatments on a given day or pooled across the three days Simple non-parametric tests therefore do not confirm our first hypothesis (1a-1c) that higher visibility increases the likelihood of meatless lunch choice.

We extend the analysis by performing a multinomial logistic regression of the categorical outcome variable daily lunch choice, i.e. the type of lunch (vegan, vegetarian, or meat/fish) that an individual chooses for one of the three conference days. The lunch choice of a conference participant on a given day is regressed on a treatment dummy as well as gender, age, registration order, affiliation, position, a dummy for whether the carbon offsetting option was chosen, conference day, and a dummy indicating above-median or below-median per-capita meat supply quantity (higher or lower than 78.24 kg) in participants' country of residence in 2020. A list of the per-capita meat supply quantity and classification below and above the median for single countries can be found in Table A1 in the Appendix. Gender levels "other/gender-expansive" ($n = 1$) and "not provided" ($n = 2$) are omitted because there are only very few observations for them. Standard errors are clustered at the individual level to account for interdependence between an individual's lunch choices on the three days. Table 2 shows the marginal and discrete probability effects from this analysis.

The regression confirms the lack of support for our first hypothesis. There is no statistically significant effect of the treatment variable on lunch choices and the estimated probability effects are close to zero. Some of the other explanatory variables show significant correlations, mostly in the expected direction. Men are on average 11 percentage points more likely to choose the meat/fish lunch than women ($p = 0.005$), and 11.1 percentage points less likely to choose the vegetarian lunch ($p = 0.006$). They do not significantly differ in their choice of a vegan lunch. Older participants have a significantly higher likelihood of choosing meat/fish and a significantly lower likelihood of choosing vegan or vegetarian. Professors and participants who did not indicate their position are less likely to choose a vegan lunch than PhD students. Participants from countries with above-median meat supply in 2020 are less likely to choose a meat/fish lunch and more likely to choose a vegan lunch. A more detailed analysis shows that this counterintuitive result is due to the many participants from Germany, a country that is just above the median meat supply. German participants have a very low likelihood of choosing the meat/fish lunch (26 % of their lunches are meat/fish compared to 55 % of non-German participants' lunches). If we estimate the same model from Table 2 without German participants (see Table A2 in the Appendix), the correlation with meat supply is small and not significant. It turns out that a much better predictor for participants' choices is the *trend* of meat supply: participants from countries in which per-capita meat supply has been increasing (rather than decreasing) in the past 30 years are about 12 percentage points more likely to choose a meat/fish lunch, and significantly less likely to choose both a vegan and a vegetarian lunch.

Interestingly, the strongest predictor of lunch choice is the use of the CO_2 offset option. On average, participants who use the offset option to compensate for their emissions are 27.9 percentage points less likely to choose a lunch with meat/fish, they are 5.5 percentage points more likely to choose a vegan lunch, and 22.4 percentage points more likely to choose a vegetarian lunch, compared to those who do not use the offset option. Although it is unlikely that participants paid for the offset option out of their own pockets, but rather from their travel or research budget, the use of this option nevertheless demonstrates a willingness to take measures to reduce their personal carbon footprint. The significant positive correlation with lunch choice suggests that the decision of conference participants to opt for a meat-free lunch is also motivated by climate protection considerations.

Alternative coding of the dependent variable, combining the three lunch choices of each participant into a pooled lunch choice variable with the possible outcomes all-vegan choices, all-vegetarian choices, all-meat/fish choices, or mixed choices, shows no significant treatment effect either. The results for the other explanatory variables shown in Table 2 remain largely unchanged. These results can be found in Table A3 in the Appendix.

In order to test the second hypothesis, we calculate predicted probabilities for all lunch choices across gender and treatment groups with the "SPost13" package in Stata (Long and Freese, 2014). We test differences between treatments within gender groups, differences between genders within treatment groups, and the interaction between treatment and gender, i.e. second differences. Fig. 4 presents the results graphically. The interaction plots show that there are no large differences between the treatment groups in the likelihood of choosing a meat/fish lunch or a vegetarian lunch, and this is true for both men and women. For these outcome variables, we find no statistically significant interaction between treatment and gender and thus no support for hypotheses 2b and 2c. There is a statistically significant interaction between treatment and gender for the likelihood of choosing a vegan lunch. For men, the likelihood of choosing a vegan lunch increases from 4.8 % in the control group to 10.4 % in the treatment group. This is a statistically significant increase ($p = 0.041$). For women, the predicted probability of choosing a vegan lunch decreases from 10.1 % in the control group to 4.6 % in the treatment group. This reduction is not statistically significant ($p = 0.134$), likely due to the smaller number of observations, but it does lead to a significant interaction between treatment and gender for vegan choices ($p = 0.013$ for the second difference). We also find this significant interaction effect for the pooled lunch choices (see Fig. A1 in the Appendix). The likelihood of vegan lunch choice is generally low for both gender groups, but it is worth noting that this result is in direct contradiction to our hypothesis 2a, which predicts lower sensitivity to increased visibility for men.

Figure 5 presents the interaction between treatment and per-capita meat supply in participants' country of residence, which we take as a proxy for the descriptive social norms to which participants are regularly exposed. In the graph, we distinguish between participants from countries with relatively high per-capita meat supply (above median) and participants from countries with relatively low per-capita meat supply (below median). The figure shows that the treatment differences within these two groups are moderate and for the vegetarian and meat/fish lunch not statistically significant.

The probability of choosing a vegetarian lunch remains almost unchanged in both groups as a result of the treatment. In the control group, participants from countries with above-median meat supply have a significantly lower probability of choosing a meat/fish lunch than participants from countries with a below-median meat supply which, as already explained, is mainly driven by the German participants. The significant difference between participants from above-median and below-median countries disappears in the treatment group because participants from above-median countries slightly reduce the choice of meat/fish and participants from below-median countries slightly increase it compared to the control group. In turn, participants from countries with a high meat supply are more likely to opt for the vegan lunch than participants from countries with a low meat supply in the control group. This significant difference disappears again in the treatment because the two groups of participants converge. Participants from countries with above-median meat supply reduce vegan choices compared to the control group. Participants from countries with below-median meat supply increase vegan choices, and this increase is statistically significant even if we exclude the German participants (see Fig. A2 in the Appendix). This also leads to a significant interaction effect between treatment and meat supply for vegan choices ($p = 0.022$ for the second difference). The interaction remains statistically significant

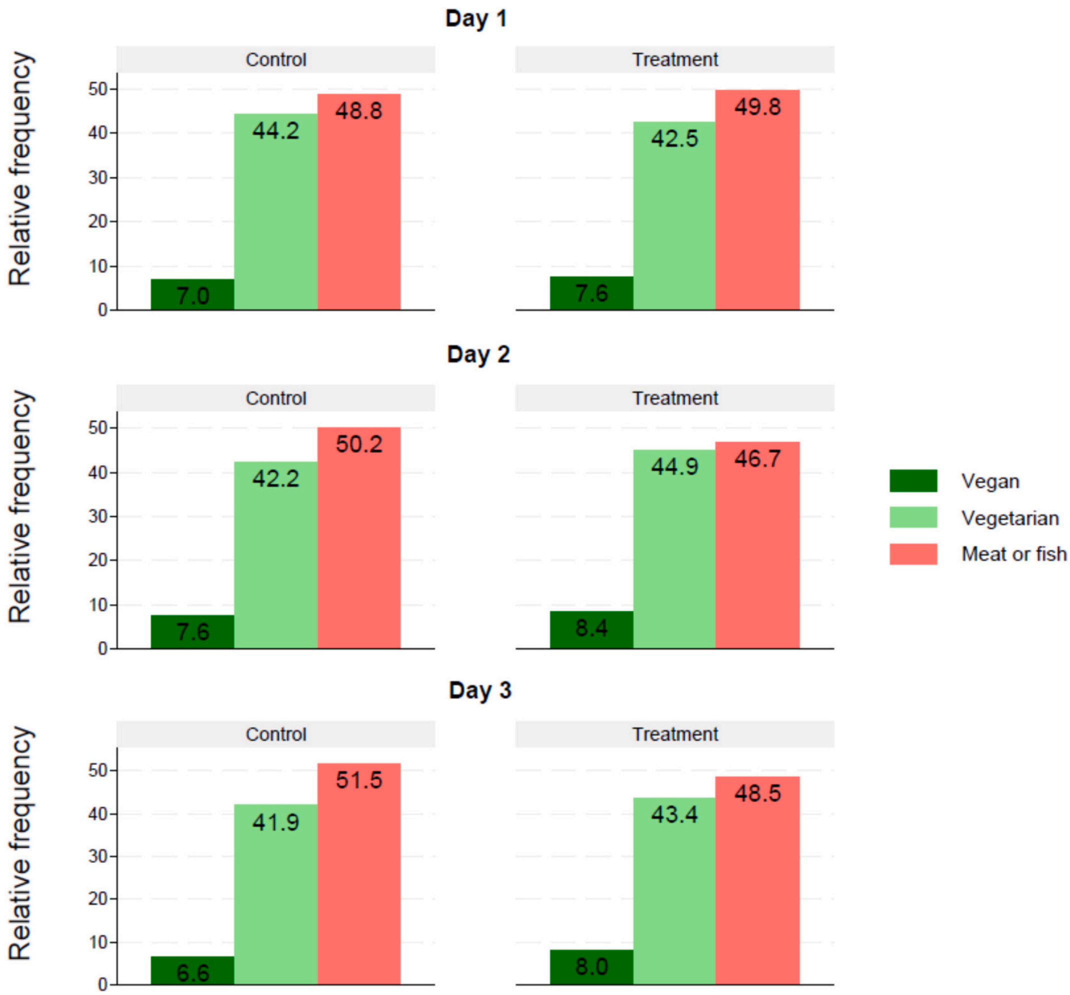

Fig. 3. Lunch choices by day and treatment.
The graph shows relative frequency of lunch choice by treatment group and day. χ^2 test statistics are as follows. All three days: $\chi^2(2) = 0.86$, $p = 0.65$. Day 1: $\chi^2(2) = 0.20$, $p = 0.90$. Day 2: $\chi^2(2) = 0.69$, $p = 0.71$. Day 3: $\chi^2(2) = 0.71$, $p = 0.70$.

when we pool the three lunch choices (see Fig. A3 in the Appendix). We do not find such counterintuitive results when we look at interactions with the meat supply trend variable. In the treatment group, participants from countries with increasing meat supply are significantly more likely to choose a meat/fish lunch and significantly less likely to choose a vegan or vegetarian lunch, while there are no significant treatment or interaction effects (see Fig. A5 in the Appendix).

All other exploratory interaction analyses mentioned in footnote 7 do not reveal any significant interaction effects or group-specific treatment effects. This also includes an analysis with regard to registration order, aimed at exploring potential interactions between the treatment and intertemporal mechanisms (VanEpps et al., 2016).[9] For example, if we assume that participants are more patient, act more sustainably, and are less influenced by visceral factors when making long-term meal plans compared to short-term ones, then we might expect a larger treatment effect among those who registered for the conference early. On the other hand, if it is not so much the benefit of the preferred meal that is discounted, but rather the emotions evoked by the labeled name tags, such as pride or shame, then we would expect a larger treatment effect among those who registered late for the conference. Using the data on participants' registration order, we find no significant differences between people who registered early and those who registered late in their response to the treatment with our original daily lunch choice variable. There is a slight tendency for late registrants in the treatment group to choose vegan more often, and vegetarian less often, compared to late registrants the control group and to early registrants (as shown in Fig. A7 in the Appendix). In our robustness check with pooled lunch choices, the differences between the treatment and control group with regard to all-vegan choices reach statistical significance for late registrants, as do several second differences (Fig. A8 in the Appendix). This suggests that the emotions evoked by the labeled name tags are discounted and that larger treatment effects might be expected when the decision is closer to the event. However, the evidence for this is very weak in our data and needs to be confirmed by further research.

Finally, we turn to the information obtained from the post-conference evaluation questionnaire. The questions relating to our experiment were answered by between 347 and 350 respondents, which represents about half of the conference participants. Of the respondents who completed the post-conference questionnaire, 50.3 % indicated that they were not aware that a lunch choice experiment took place during registration, while 42.6 % indicated that they were aware, and the remaining respondents answered “N/A". We also asked whether respondents were aware that their choice of lunch would be displayed on their conference name badge. Of those surveyed, 8.4 % answered yes to this question, while 10.1 % said they were not sure and 81.6 % answered

[9] The registration-time variable differs from the one specified in the pre-analysis plan because in the end we only received the data about the order of registration and not the exact time of the registration.

Table 2
Marginal and discrete effects from multinomial regression of daily lunch choice.

	Daily lunch choice		
	Vegan	Vegetarian	Meat/fish
Treated	0.011	−0.017	0.005
	(0.615)	(0.656)	(0.882)
Male	0.001	**−0.111*** **	**0.110*** **
	(0.970)	(0.006)	(0.005)
Age	**−0.003** **	**−0.005** **	**0.008*** **
	(0.012)	(0.030)	(0.000)
Registration order	0.000	−0.000	0.000
	(0.219)	(0.413)	(0.934)
Affiliation (Base category: University)			
Research Institute	0.003	0.057	−0.061
	(0.904)	(0.262)	(0.222)
Company, government or other	0.058	−0.085	0.028
	(0.375)	(0.331)	(0.746)
Position (base category: PhD student)			
Professor	**−0.075** **	0.081	−0.005
	(0.031)	(0.223)	(0.937)
Postdoctoral researcher	−0.035	0.063	−0.027
	(0.489)	(0.458)	(0.738)
Other	−0.019	0.054	−0.035
	(0.633)	(0.379)	(0.580)
Not stated	**−0.053* **	**0.127** **	−0.074
	(0.081)	(0.019)	(0.183)
Per-capita meat supply quantity in 2020 above median	**0.050** **	0.026	**−0.077** **
	(0.031)	(0.489)	(0.042)
Carbon offsetting option chosen	**0.055* **	**0.224*** **	**−0.279*** **
	(0.067)	(0.000)	(0.000)
Conference day (base category: Day 1)			
Day 2	**0.007* **	0.001	−0.008
	(0.098)	(0.933)	(0.401)
Day 3	0.000	−0.006	0.006
	(0.974)	(0.659)	(0.663)
Number of observations (lunch choices)		1.714	

Numbers show estimated average marginal (age, registration order) or discrete (all other variables) probability effects of multinomial logistic regressions with standard errors clustered at the individual level. p-values in parentheses. Levels of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

no. This suggests that some participants may not have read the information carefully during the registration process. At the same time, we note that the post-conference survey took place several months after the intervention, while the relevant decisions (i.e. the choice of lunch) were made on the same website immediately after the intervention. Hence either inattention when registering or imperfect recall when debriefing (or both) may underpin the low treatment awareness.

The post-conference evaluation questionnaire results revealed additional insights into the participants' perceptions of the intervention. Among respondents, 35.2 % were happy about having had lunch choices printed on the conference badge, while 23.2 % disliked it, with the remaining 41.5 % being indifferent. It is noteworthy that the majority of respondents did not oppose this feature, suggesting that the new lunch visibility practice was accepted overall. Furthermore, the data indicate that the majority of participants (61.9 %) acknowledged observing others' food preferences displayed on badges. Conversations during breaks and social events corroborate this finding, as they often revolved around the food labels in the badge, suggesting a heightened awareness among attendees regarding their peers' dietary choices. This underscores the efficacy of the color-coding system as a visibility mechanism.

5. Discussion and conclusions

We have conducted a field experiment at a large environmental economics conference to investigate whether increased visibility leads participants to choose meatless lunches more often. The answer to this question is no. The distribution of lunches is almost identical in the treatment group and the control group. There are significant effects only in certain subgroups for the choice of the vegan lunch. Male participants and participants from countries with a relatively low per-capita meat supply are more likely to choose a vegan lunch if the choice is exposed to particular visibility. We must note though that the proportion of vegan lunches is low overall and the evidence for these effects is weak.

As the intervention had to be implemented unobtrusively as part of the usual registration procedure at the request of the conference organizer, we cannot rule out the possibility that some participants in the treatment group did not read the relevant information carefully or did not consider the implications of their choice. The answers to the post-conference evaluation questionnaire indeed suggest that some treated participants did not pay attention to the visibility information or at least could not remember it. In addition, the relatively long time lag between the lunch selection and the conference may have led participants to not consider the implications of increased visibility carefully or to discount them. In other words, we cannot rule out that a different design that immediately and more noticeably changes visibility would have a greater impact on the food choices of this population.

What distinguishes our study from previous studies on the effects of visibility on food choices (Dannenberg and Weingärtner, 2023; Dannenberg et al., 2024b) is that we are looking at a population that is well informed about the climate impact of dietary choices. This knowledge about the climate impacts, however, does not mean that all these individuals abstain from meat or that they consider this to be appropriate. Unfortunately, we do not have any individual-specific information about the conference participants' usual diets or what they consider to be an appropriate diet. A survey conducted after an earlier conference with a similar and partially overlapping group of participants (the World Congress of Environmental and Resource Economists in 2018) shows that dietary habits and views vary.[10] For example, the share of vegetarian meals among participants' regular weekly meals at home is on average 48 %, with a high standard deviation of 32. The mean is higher among females than among males and higher among Masters and PhD students than among professors. Participants from countries with above-median meat supply have a higher share of vegetarian meals and they view being served mainly vegetarian food at the conference more positively than participants from countries with below-median meat supply. If we look at the meat supply trend, we recover the more intuitive correlation: participants from countries with decreasing trend eat vegetarian meals more often and also view vegetarian meals at conferences more positively than participants from countries with increasing trend. Among all respondents, more than half rate the decision to mainly serve vegetarian food as positive, while one sixth rate it as negative. Taken together, these results suggest that visible abstinence from meat is appreciated by many, but not all, observers.

This heterogeneity among well-informed individuals points to the potential role of multiple, and possibly conflicting, identities. We cannot rule out the possibility that participants held different food-related identities, affecting their choices and views, which, once triggered by increased visibility, may have canceled the effect out. While we use proxies for the identities, such as gender, age, academic position and country-specific meat supply, the design impeded the investigation of other more behavior-specific identities which can directly influence meat consumption. Future studies might consider examining the

[10] Thomas Sterner kindly provided us with this anonymous data set. For a commentary by Sterner, Ewald, and Mukanjari, see https://www.eaere.org/wp-content/uploads/2019/05/EAERE-Magazine_n.5-Spring-2019.pdf. As they aptly note "[…] eating is a deeply personal experience and if there is an area where inconsequential and illogical behavior and opinions are to be expected it will be in this area".

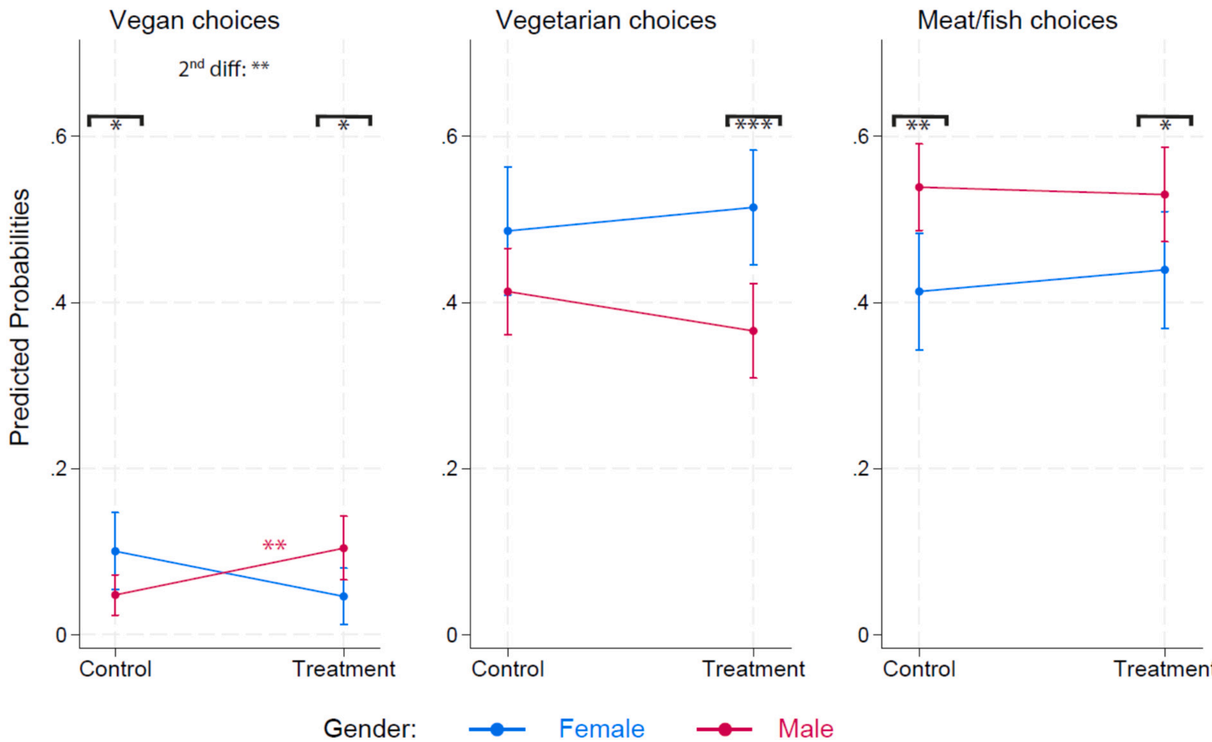

Fig. 4. Interaction between treatment and gender.
The graphs show predicted probabilities across treatment and gender from a multinomial logit model of daily lunch choice with an interaction term between treatment and gender. Standard errors are clustered at the individual level. Levels of significance: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

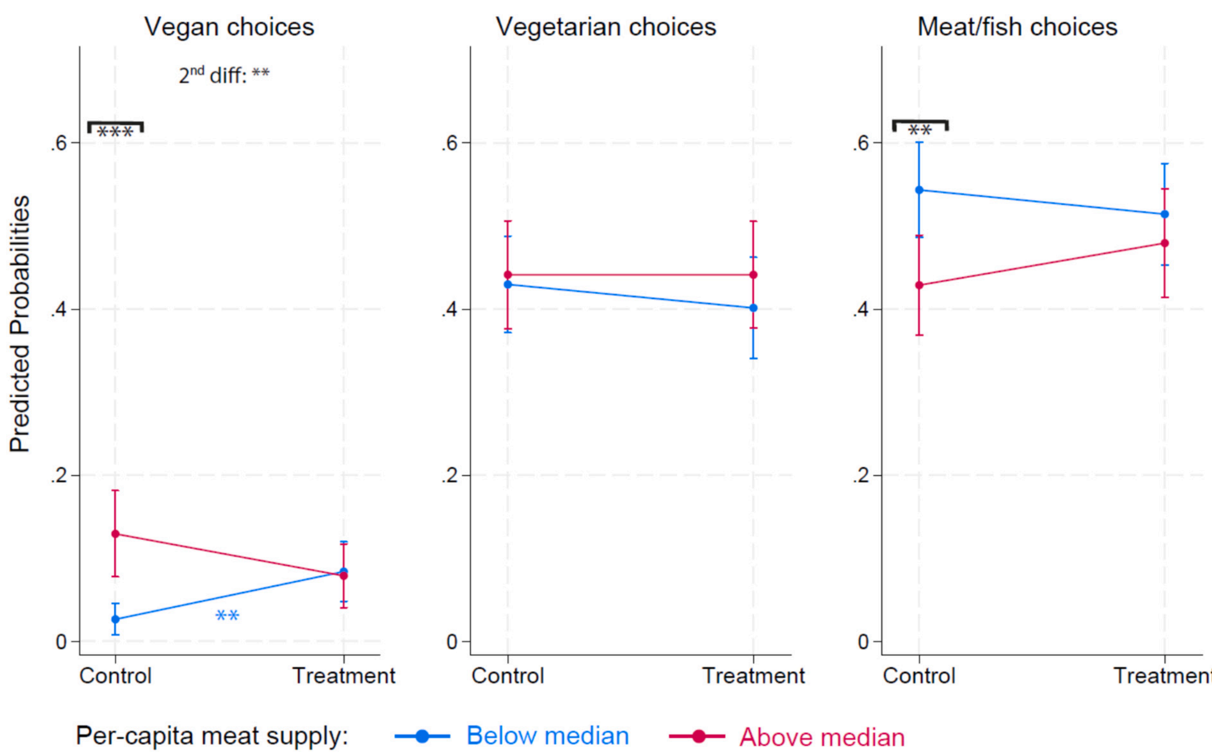

Fig. 5. Interaction between treatment and meat supply quantity.
The graphs show predicted probabilities across treatment and meat supply quantity from a multinomial logit model of daily lunch choice with an interaction term between treatment and a meat supply dummy. Standard errors are clustered at the individual level. Levels of significance: *p < 0.10, **p < 0.05, ***p < 0.01.

interplay between visibility and multiple identities.

Of course, it must also be borne in mind that the intervention merely increased visibility by making the meal choices salient with the help of a color legend, but the chosen lunches at the conference are always visible to anyone standing nearby. It is therefore possible that reputation effects, if they exist, have already been incorporated into the participants' chosen diet and cannot be influenced by a short-term increase in visibility. What stands out in our data is that the choice of meat/fish is very stable across treatment groups, both in the full sample and within subsamples. If there are any differences at all, they relate to the choice of vegan or vegetarian food. This may support the argument that meat eaters have factored the reputational impact into their decision and that it is those who have already moved away from meat, and thus demonstrated sensitivity to the issue, who are more likely to respond to increased visibility. It is interesting that the invisible decision to offset the CO_2 emissions generated through conference attendance is highly correlated with the visible decision to choose a meatless lunch. This suggests that both decisions are driven by climate protection motives.

Overall, we must conclude that increased visibility of food choices had no significant effect on a well-informed and environmentally conscious population – be it because the implications of visibility were already factored in or because participants did not consider the implications carefully or discounted them. One might wonder whether visibility could have an effect on other populations that are less well informed and may have less stable attitudes. The results of the experiments with students suggest that the effects of observability depend on the person making the food decision, the observers, and the respective circumstances. They showed that, while observability alone had no significant effect on food choices, some groups showed a reaction when observability was accompanied by specific information. For example, when students were informed about the climate benefits of meat-free diets, observability of their food choices led some of them, particularly male students, to choose the meat-free option less often (Dannenberg and Weingärtner, 2023; Dannenberg et al., 2024b). So even if other populations may react more sensitively to increased visibility of food choices this does not mean that the reaction will necessarily go in the desired direction.

Food decisions appear to be among the behaviors that, at least in the short term, are not easily nudged by increased visibility. If the goal is to change the population's eating habits towards meatless options, stronger measures such as pricing instruments are probably required. An alternative, more paternalistic, strategy is to restrict options. While perhaps not viable at scale, this was done by the organizers of a previous environmental economics conference, who restricted meals to meatless only. This raises the overarching question of whether those dealing with certain problems and their solutions need to lead by example. This question also concerns environmental researchers and their personal choices.

CRediT authorship contribution statement

Astrid Dannenberg: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Giorgio Dini:** Writing – review & editing, Writing – original draft, Visualization, Software, Methodology, Formal analysis, Data curation. **Alessandro Tavoni:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Eva Weingärtner:** Writing – review & editing, Writing – original draft, Visualization, Software, Methodology, Formal analysis, Data curation.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Alessandro Tavoni reports financial support was provided by European Research Council,. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Appendix

In Table A2 as well as Fig. A1 and Fig. A2 below we rely on a simpler way of presenting data by pooling food choices, relative to the disaggregated approach utilized in the main text and other approaches planned in the pre-registration. Instead of using count data, we pool lunch choices that are identical (e.g. all vegetarian lunches) and compare them to those that are mixed, which works well given that most participants chose the same option on all three conference days.

Table A1: Overview of country-level meat supply data.

Below median in per-capita meat supply in 2020			Above median in per-capita meat supply in 2020		
Country	Value for per-capita meat supply in 2020 in kg	Number of participants in experimental dataset	Country	Value for per-capita meat supply in 2020 in kg	Number of participants in experimental dataset
India	4.58	5	Germany	78.76	116
Ethiopia	7.89	1	United Kingdom	79.1	43
Nepal	14.16	1	Czech Republic	79.18	5
Zambia	16.2	1	Ireland	79.2	5
United Arab Emirates	48.21	2	Hungary	82.93	1
Peru	53.35	1	Chile	83.04	2
Japan	53.42	6	New Zealand	85.03	1
Colombia	58.11	1	Poland	89.52	1
Costa Rica	58.45	1	Portugal	90.21	2
Netherlands	59.14	31	Canada	90.55	11
South Africa	59.77	2	Lithuania	90.88	3
Belgium	61.85	12	Brazil	99.15	1
China	62.1	1	Israel	99.37	4
Denmark	63.67	9	Spain	101.87	20

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Below median in per-capita meat supply in 2020			Above median in per-capita meat supply in 2020		
Country	Value for per-capita meat supply in 2020 in kg	Number of participants in experimental dataset	Country	Value for per-capita meat supply in 2020 in kg	Number of participants in experimental dataset
Malaysia	64.72	1	Australia	121.53	5
Switzerland	66.23	24	United States of America	128.62	46
Norway	67.23	22			
Sweden	68.02	20			
Italy	70.19	69			
Finland	71.38	17			
Greece	74.5	5			
Austria	76.92	9			
France	78.24	68			

Values for per-capita meat supply in 2020 are taken from the FAO Food Balance Sheet as the sum of the values of the element 'Food supply quantity (kg/capita/year)' of the items 'Bovine Meat', 'Mutton & Goat Meat', 'Pigmeat', 'Poultry Meat', and 'Meat, Other' (FAO 2023, available at https://www.fao.org/faostat/en/#data/FBS). No data is listed for Singapore (n = 1). The classification of below and above median meat supply refers to the median value among all participants in the experimental dataset (78.24 kg). Countries in blue are countries with a decreasing meat trend, while countries in red are countries with an increasing meat trend in the period from 1990 to 2020. To determine the trend, we added earlier data (FAO 2023, available at https://www.fao.org/faostat/en/#data/FBSH) and regressed meat supply on year for each country; countries with a year coefficient lower than zero are defined as decreasing, while country with a coefficient larger than zero are determined as increasing. For some countries, data is only available for fewer years (Belgium: 21, Ethiopia: 28, Lithuania: 29).

Table A2: Marginal and discrete effects from multinomial logit model of daily lunch choice without German participants.

	Daily lunch choice		
	Vegan	Vegetarian	Meat/fish
Treated	0.032	−0.030	−0.002
	(0.137)	(0.468)	(0.965)
Male	0.015	**−0.122*****	**0.108****
	(0.491)	(0.006)	(0.017)
Age	**−0.003****	−0.004	**0.007*****
	(0.013)	(0.118)	(0.003)
Registration order	0.000	−0.000	0.000
	(0.715)	(0.699)	(0.847)
Affiliation (Base category: University)			
Research Institute	−0.011	0.027	−0.016
	(0.725)	(0.673)	(0.802)
Company, government or other	0.032	−0.034	0.003
	(0.584)	(0.705)	(0.976)
Position (base category: PhD student)			
Professor	**−0.055***	0.077	−0.022
	(0.094)	(0.279)	(0.759)
Postdoctoral researcher	−0.043	0.096	−0.053
	(0.310)	(0.298)	(0.552)
Other	−0.012	0.028	−0.016
	(0.757)	(0.666)	(0.821)
Not stated	**−0.060****	**0.140****	−0.079
	(0.029)	(0.031)	(0.231)
Per-capita meat supply quantity in 2020 above median	0.028	−0.035	0.006
	(0.281)	(0.428)	(0.889)
Carbon offsetting option chosen	0.042	**0.211*****	**−0.253*****
	(0.160)	(0.000)	(0.000)
Conference day (base category: Day 1)			
Day 2	**0.011****	−0.004	−0.007
	(0.024)	(0.718)	(0.479)
Day 3	0.000	−0.012	0.012
	(0.465)	(0.445)	(0.447)
Number of observations (lunch choices)		1.369	

Numbers show estimated average marginal (age, registration order) or discrete (all other variables) probability effects of a multinomial logit model with standard errors clustered at the individual level. p-values in parentheses. Levels of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Marginal and discrete effects from multinomial logit model of pooled lunch choice.

	Pooled lunch choice			
	All vegan lunches	All vegetarian lunches	All meat lunches	Mixed lunches
Treated	0.012	−0.012	0.009	−0.009
	(0.607)	(0.761)	(0.811)	(0.753)
Male	0.001	**−0.085****	**0.138*****	−0.053
	(0.979)	(0.046)	(0.001)	(0.102)
Age	**−0.003****	**−0.004***	**0.008*****	−0.001
	(0.017)	(0.081)	(0.000)	(0.509)
Registration order	0.000	−0.000	0.000	−0.000
	(0.272)	(0.687)	(0.728)	(0.442)
Per capita meat supply quantity in 2020 above median	**0.053****	0.025	**−0.088****	0.009
	(0.023)	(0.525)	(0.027)	(0.745)
Affiliation (base category: University)				
Research institute	0.006	0.066	−0.040	−0.031
	(0.835)	(0.219)	(0.445)	(0.386)
Company, government, or other	0.067	−0.054	0.064	−0.077
	(0.313)	(0.549)	(0.466)	(0.133)
Position (base category: Doctoral student)				
Professor	**−0.069****	0.066	0.000	0.003
	(0.049)	(0.344)	(0.996)	(0.944)
Postdoctoral researcher	−0.030	0.035	−0.014	0.009
	(0.562)	(0.689)	(0.871)	(0.885)
Other	−0.016	0.059	−0.026	−0.017
	(0.679)	(0.355)	(0.705)	(0.717)
Not stated	−0.055*	0.088	−0.089	0.056
	(0.073)	(0.122)	(0.144)	(0.194)
Carbon offset chosen	**0.056***	**0.235*****	**−0.264*****	−0.028
	(0.059)	(0.000)	(0.000)	(0.385)
N		571		

Table shows estimated average marginal (age, registration order) or discrete (all other variables) probability effects of a multinomial logit model. p-values in parentheses. Levels of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Marginal and discrete effects from multinomial logit models of lunch choice with different meat supply variables.

	(1) Lunch choice			(2) Lunch choice			(3) Lunch choice		
	Vegan	Vegetarian	Meat/fish	Vegan	Vegetarian	Meat/fish	Vegan	Vegetarian	Meat/fish
Treated	0.011	−0.017	0.005	0.013	−0.019	0.006	0.011	−0.018	0.007
	(0.615)	(0.656)	(0.882)	(0.559)	(0.609)	(0.862)	(0.641)	(0.637)	(0.841)
Male	0.001	**−0.111*****	**0.110*****	0.009	**−0.108*****	**0.099****	0.002	**−0.107*****	**0.105*****
	(0.970)	(0.006)	(0.005)	(0.695)	(0.007)	(0.011)	(0.923)	(0.008)	(0.007)
Age	**−0.003****	**−0.005****	**0.008*****	**−0.003****	**−0.004***	**0.007*****	**−0.003****	**−0.004***	**0.007*****
	(0.012)	(0.030)	(0.000)	(0.035)	(0.055)	(0.001)	(0.032)	(0.063)	(0.001)
Registration order	0.000	−0.000	0.000	0.000	−0.000	0.000	0.000	−0.000	0.000
	(0.219)	(0.413)	(0.934)	(0.306)	(0.446)	(0.871)	(0.250)	(0.426)	(0.905)
Affiliation (base category: University)									
Research institute	0.003	0.057	−0.061	0.002	0.048	−0.050	−0.007	0.047	−0.041
	(0.904)	(0.262)	(0.222)	(0.952)	(0.346)	(0.312)	(0.793)	(0.357)	(0.416)
Company, government, or other	0.058	−0.085	0.028	0.045	−0.096	0.051	0.061	−0.094	0.033
	(0.375)	(0.331)	(0.746)	(0.488)	(0.266)	(0.540)	(0.354)	(0.278)	(0.687)
Position (base category: Doctoral student)									
Professor	**−0.075****	0.081	−0.005	**−0.067****	0.083	−0.016	**−0.072****	0.081	−0.009
	(0.031)	(0.223)	(0.937)	(0.050)	(0.211)	(0.814)	(0.042)	(0.223)	(0.895)
Postdoctoral researcher	−0.035	0.063	−0.027	−0.026	0.062	−0.036	−0.028	0.065	−0.037
	(0.489)	(0.458)	(0.738)	(0.602)	(0.459)	(0.647)	(0.598)	(0.440)	(0.644)
Other	−0.019	0.054	−0.035	−0.004	0.062	−0.057	−0.010	0.062	−0.052
	(0.633)	(0.379)	(0.580)	(0.921)	(0.323)	(0.359)	(0.805)	(0.318)	(0.408)

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	(1) Lunch choice			(2) Lunch choice			(3) Lunch choice		
	Vegan	Vegetarian	Meat/fish	Vegan	Vegetarian	Meat/fish	Vegan	Vegetarian	Meat/fish
Not stated	**−0.053***	**0.127****	−0.074	−0.042	**0.124****	−0.081	**−0.056***	**0.116****	−0.060
	(0.081)	(0.019)	(0.183)	(0.153)	(0.021)	(0.134)	(0.062)	(0.033)	(0.277)
Carbon offset chosen	**0.055***	**0.224*****	**−0.279*****	**0.055***	**0.221*****	**−0.277*****	**0.049***	**0.222*****	**−0.271*****
	(0.067)	(0.000)	(0.000)	(0.070)	(0.000)	(0.000)	(0.098)	(0.000)	(0.000)
Conference day (base category: Day 1)									
Day 2	**0.007***	0.001	−0.008	0.007*	0.001	−0.008	**0.007***	0.001	−0.008
	(0.098)	(0.933)	(0.401)	(0.094)	(0.925)	(0.393)	(0.098)	(0.927)	(0.397)
Day 3	0.000	−0.006	0.006	0.000	−0.006	0.006	0.000	−0.006	0.006
	(0.974)	(0.659)	(0.663)	(0.955)	(0.664)	(0.671)	(0.971)	(0.662)	(0.667)
Per capita meat supply quantity in 2020 above median	**0.050****	0.026	**−0.077****				**0.060****	0.041	**−0.101*****
	(0.031)	(0.489)	(0.042)				(0.012)	(0.282)	(0.007)
Per capita meat supply increasing in past 30 years				**−0.039***	**−0.082****	**0.121*****	**−0.048****	**−0.092****	**0.141*****
				(0.076)	(0.044)	(0.003)	(0.015)	(0.024)	(0.001)
N		1.714			1.714			1.714	

Table shows estimated average marginal (age, registration order) or discrete (all other variables) probability effects of multinomial logit models with standard errors clustered at the individual level. p-values in parentheses. Levels of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

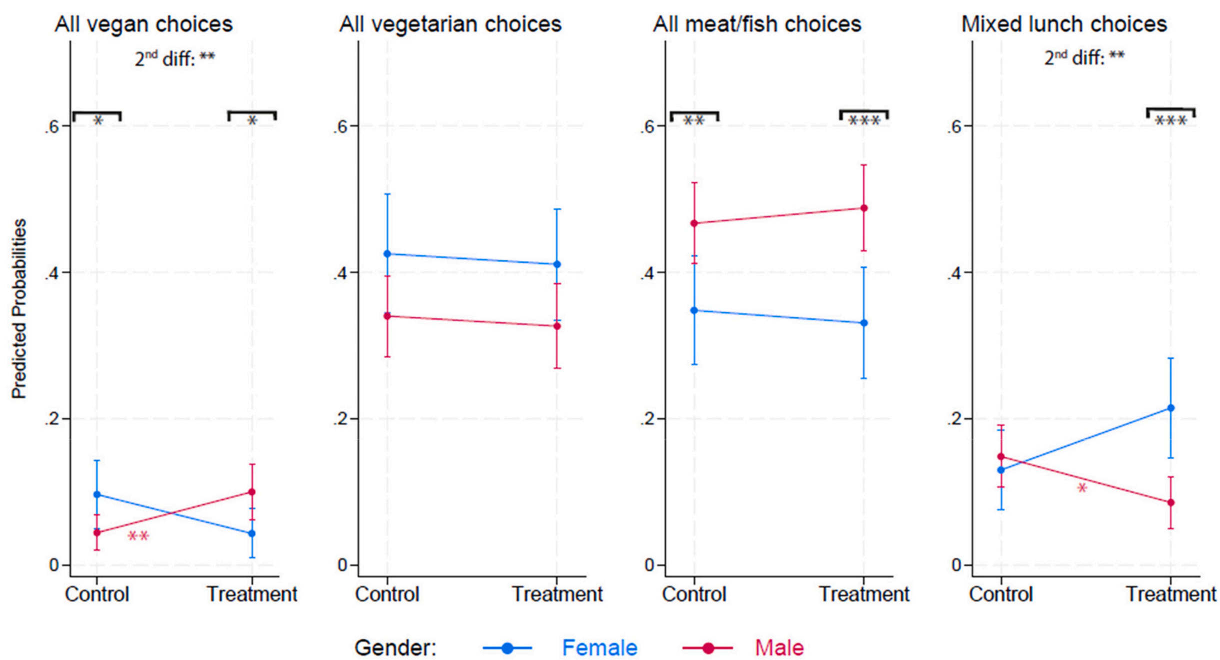

Fig. A1: Interaction plot treatment and gender for pooled lunch choices. Graph shows predicted probabilities across treatment and gender from a multinomial logit model of pooled lunch choice with an interaction term between treatment and gender. *$p < 0.10$, **$p < 0.05$, ***$p < 0.0$

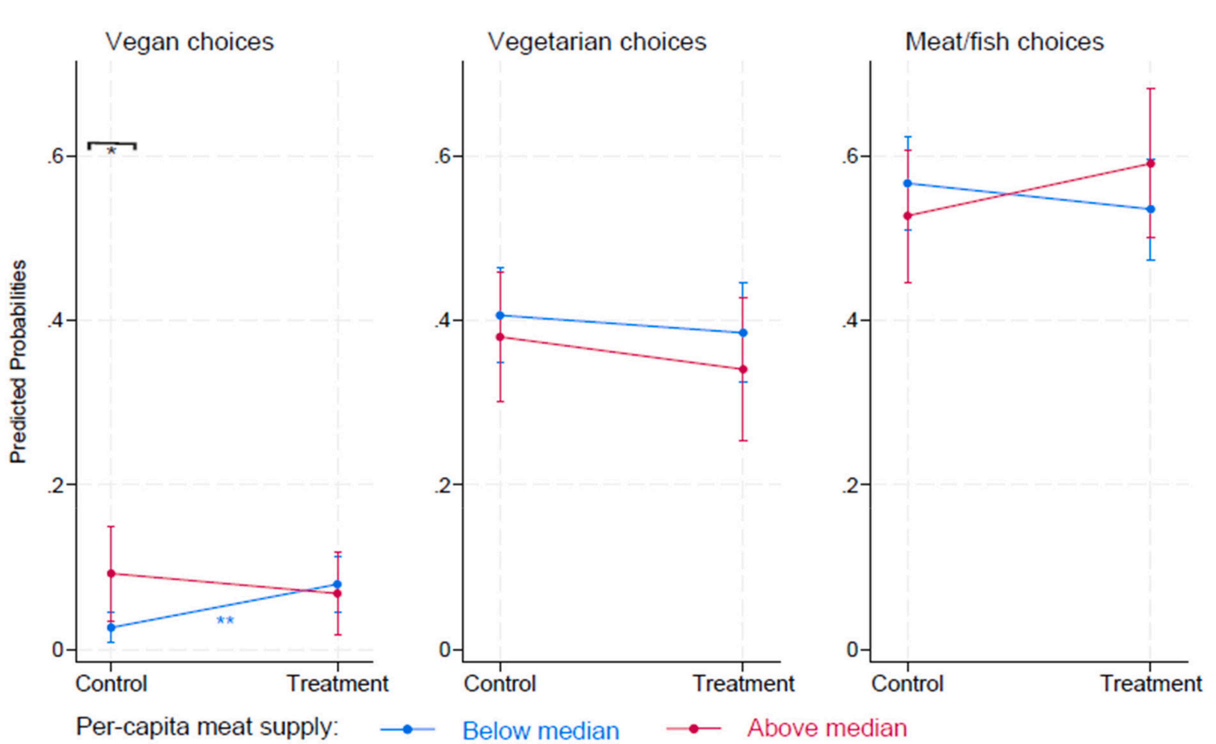

Fig. A2: Interaction plot treatment and meat supply quantity for daily lunch choices excluding German participants. Graph shows predicted probabilities across treatment and meat supply quantity from a multinomial logit model of daily lunch choice with an interaction term between treatment and a meat supply dummy and standard errors clustered at the individual level. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

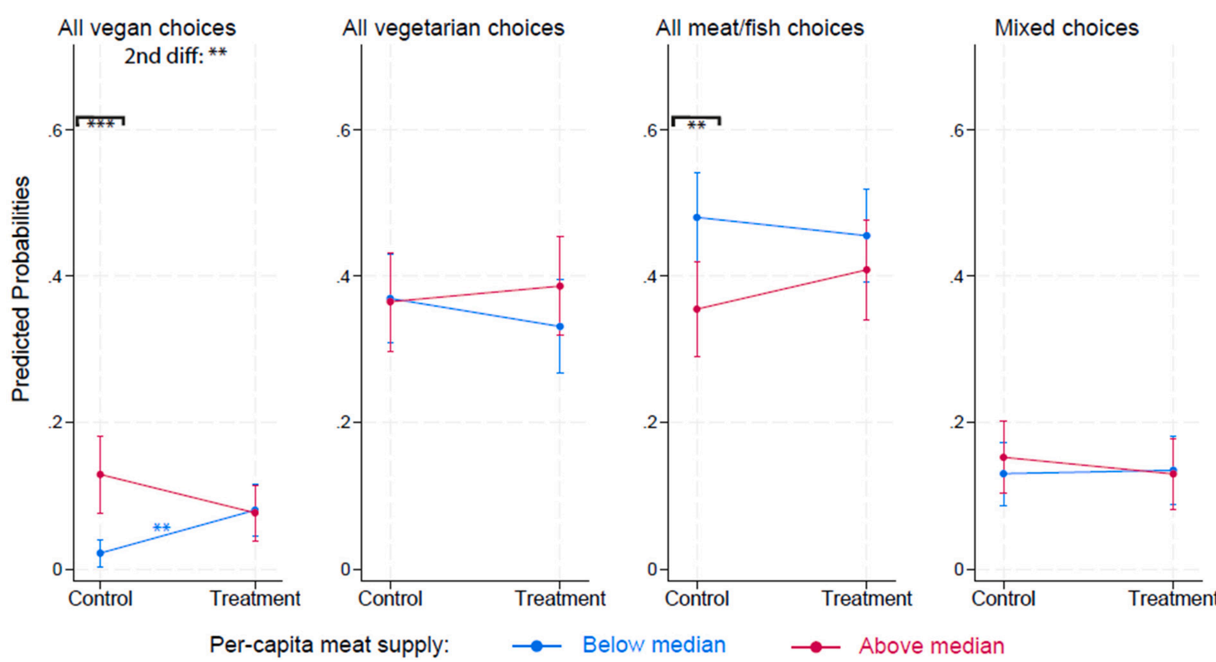

Fig. A3: Interaction plot treatment and meat supply quantity for pooled lunch choices. Graph shows predicted probabilities across treatment and meat supply quantity from a multinomial logit model of pooled lunch choice with an interaction term between treatment and a meat supply dummy. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

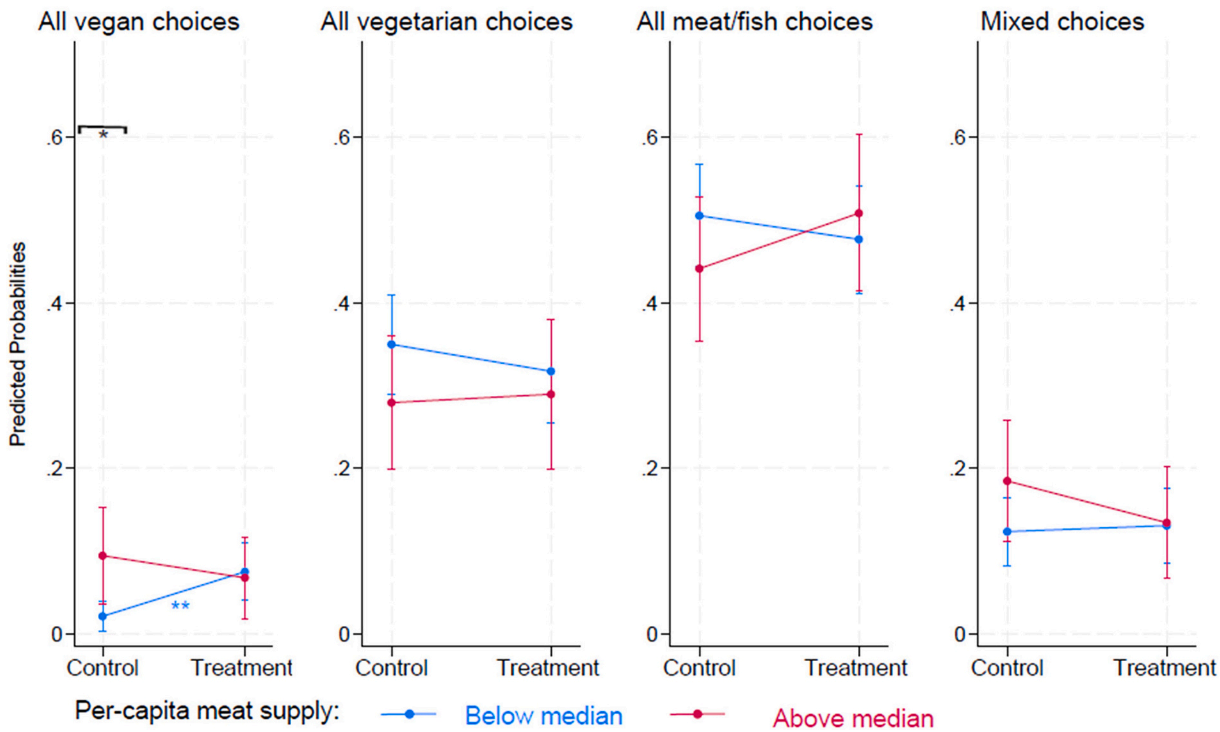

Fig. A4: Interaction plot treatment and meat supply quantity for pooled lunch choices excluding German participants. Graph shows predicted probabilities across treatment and meat supply quantity from a multinomial logit model of pooled lunch choice with an interaction term between treatment and a meat supply dummy. *p < 0.10, **p < 0.05, ***p < 0.01.

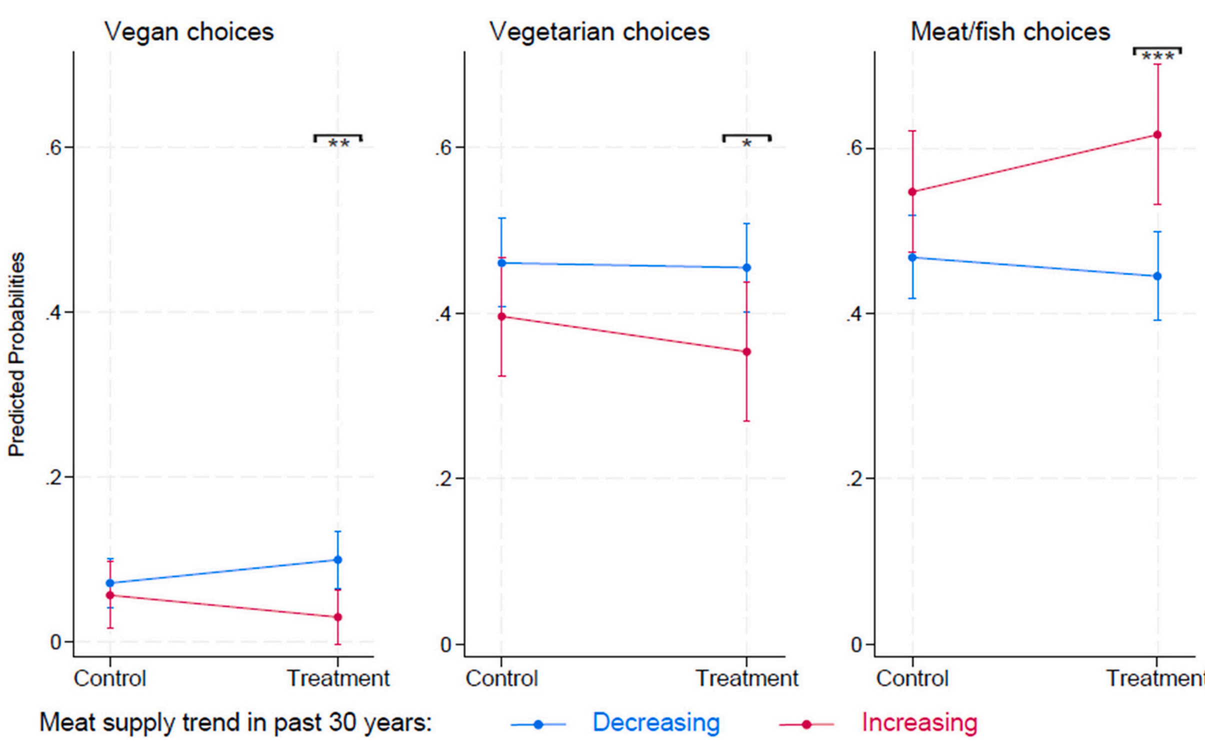

Fig. A5: Interaction plot treatment and meat supply trend for daily lunch choices. Graph shows predicted probabilities across treatment and meat supply trend in the past 30 years from a multinomial logit model of daily lunch choice with an interaction term between treatment and meat supply trend dummy and standard errors clustered at the individual level. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

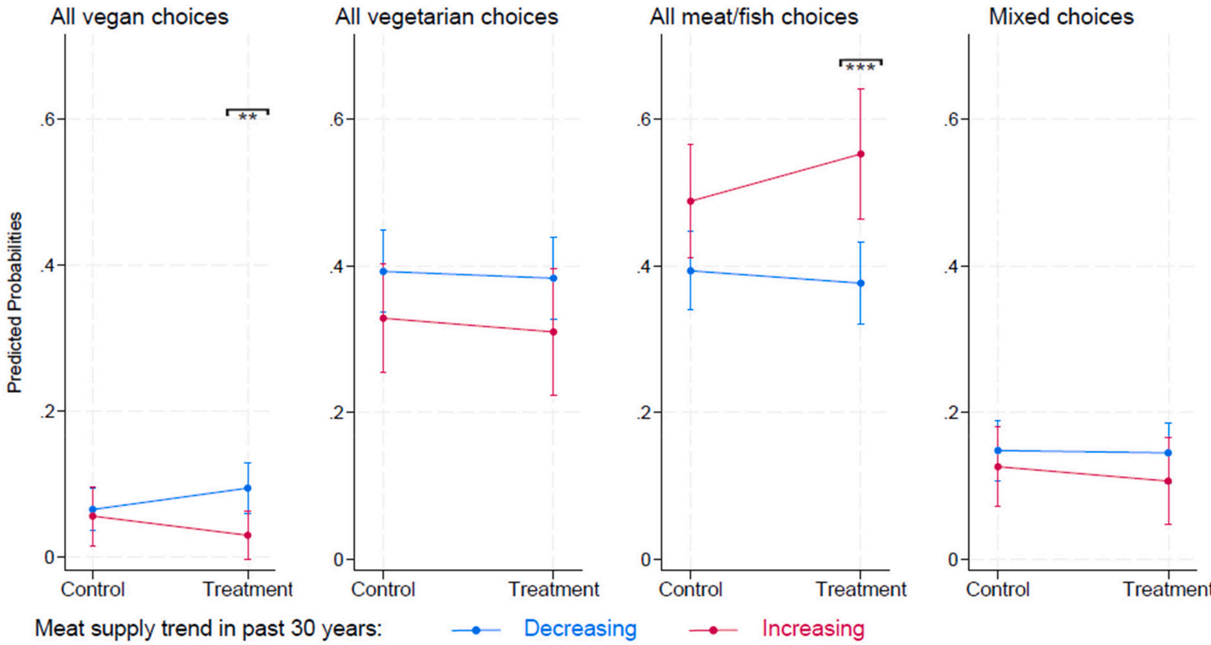

Fig. A6: Interaction plot treatment and meat supply trend for pooled lunch choices. Graph shows predicted probabilities across treatment and meat supply trend in the past 30 years from a multinomial logit model of pooled lunch choice with an interaction term between treatment and meat supply trend dummy. *p < 0.10, **p < 0.05, ***p < 0.01.

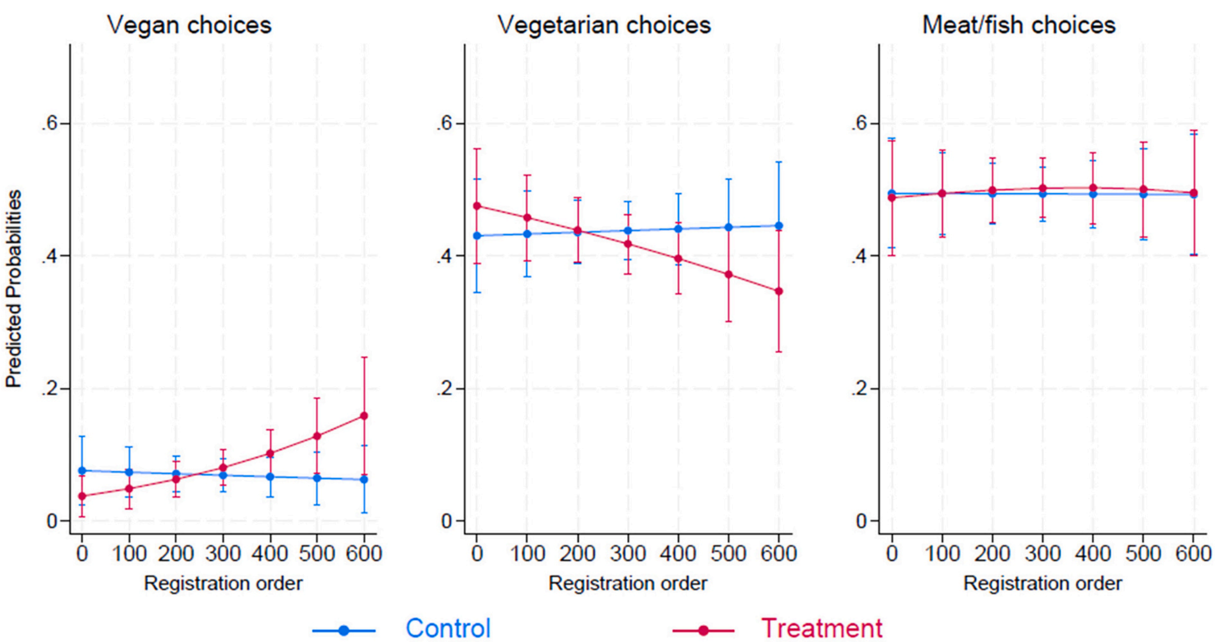

Fig. A7: Interaction plot treatment and registration order for daily lunch choices. Graph shows predicted probabilities across treatments and registration order from a multinomial logit model of daily lunch choice with an interaction term between treatment and registration order and standard errors clustered at the individual level. A higher number for registration order indicates later registration. Within the treatment group, the predicted probabilities for vegan choices differ significantly between several pairwise combinations of levels of registration order. This is not the case for the control group and for both groups with regard to vegetarian and meat/fish choices. There are no significant treatment or interaction effects. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

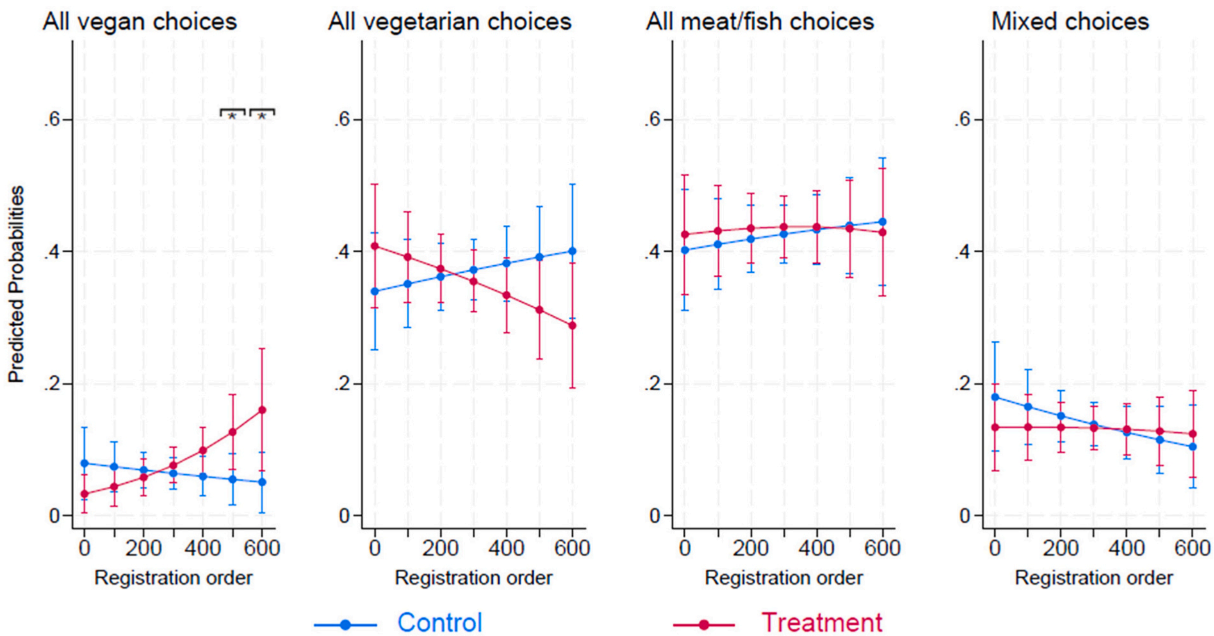

Fig. A8: Interaction plot treatment and registration order for pooled lunch choices. Graph shows predicted probabilities across treatments and registration order from a multinomial logit model of pooled lunch choices with an interaction term between treatment and registration order. A higher number for registration order indicates later registration. Within the treatment group, the predicted probabilities for all-vegan choices differ significantly between several pairwise combinations of levels of registration order. This is not the case for the control group and for both groups with regard to the other outcomes. At registration order 500 and 600, all-vegan choices differ significantly between treatment and control group. Several second differences are significant at the 10 % level for all-vegan choices, indicating heterogeneous treatment effects for different levels of registration order. For the other three outcomes, there are no significant treatment or interaction effects. *p < 0.10, **p < 0.05, ***p < 0.01.

Data availability

Data will be made available on request.

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