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## Political ideology shapes heterogeneous preferences for food values

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### ABSTRACT

We investigate the associations between political ideology and heterogeneous consumer preferences for food values. Marketing literature emphasizes the polarizing role of political ideology in consumer preferences. Despite the growing recognition of this relationship, scarce evidence exists regarding food value preferences across the political spectrum. Using survey data from 637 respondents, our findings reveal that conservatism relates to heterogeneous consumer preferences for food values. Specifically, conservatism is positively associated with naturalness and tradition, and negatively with environmental impact. These results underscore the potential of political ideology as a predictor of food preferences, suggesting its potential application in developing targeted marketing programs and policy interventions. Accordingly, marketing and policy communications should be tailored to align with the intended audience's political ideology. Managerial implications further expand to the promotion of ethical and sustainable food products, the introduction of innovative food technologies, and the adoption of sustainable supply chains.

### 1. Introduction

A comprehensive understanding of the drivers underlying consumer heterogeneity is crucial for devising successful marketing strategies, such as product differentiation (Giannakas, 2011; Hobbs, 2019). Marketing managers must be aware of the priorities of each consumer group in order to develop effective strategies, which may include positioning their products based on observable criteria and employing more targeted communications. Furthermore, policymakers can leverage this knowledge to design more efficient behavioral interventions tailored to the specific values and preferences of different ideological segments. Political ideology has garnered increased interest in consumer research (Adaval & Wyer, 2022; Lisjak & Ordabayeva, 2022), as it is a vital factor contributing to consumer heterogeneity.

This ideological divide has been observed to polarize consumers between Democratic (vs. Republican) brands (Schoenmueller et al., 2023), brands that emphasize power (vs. universalism) (Shepherd et al., 2015), hedonic (vs. utilitarian) consumption (Farmer et al., 2021), and local (vs. global) consumer experiences (Buechner et al., 2022). The market segmentation based on political ideology reveals easily distinguishable ideological segments, each possessing heterogeneous psychographic characteristics (e.g., values, personality) and varying preferences (Jost et al., 2017; Jung & Mittal, 2020). Consequently, a

comprehensive understanding of consumers' political ideology is essential for making informed managerial decisions (Shavitt, 2017). Despite the apparent influence of political ideology on various aspects of consumer behavior, there remains a lack of evidence concerning its potential polarizing effect on food consumption.

Recent literature suggests that conservatives are less likely to reduce food waste (Mas et al., 2022), and demonstrate less preference for sustainability labels (Gohary et al., 2023; Lin & Nayga, 2022). While there are observable differences in attitudes toward food safety across the political spectrum (Lusk, 2012), opinions converge regarding organic and local food (Biedny et al., 2020). In this study, we investigate the relationship between political ideology and the heterogeneity of consumer preferences concerning food values.

Lusk and Briggeman (2009) introduced food values as meta-attributes encompassing consumer preferences for various food characteristics, such as naturalness, taste, and origin. Food values influence food choices; for instance, the environmental impact is associated with consumer preferences for alternative milk and fair-labor-labeled food products (Piracci et al., 2022; Sun et al., 2023). Food values exhibit relative stability over time (Cerroni et al., 2021; Ellison et al., 2021) and across countries (Bazzani et al., 2018; Sun et al., 2023; Yang & Hobbs, 2020), and are less susceptible to biases inherent in studying food preferences (e.g., food product type, Lusk & Briggeman, 2009).

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This study follows the same approach as in Lusk and Briggeman (2009) by measuring food values using the Best Worst Scaling method. Specifically, following the Random Utility Theory (RUT) framework, we determine the utility consumers attribute to each food value (Lusk & Briggeman, 2009). However, in contrast to Lusk and Briggeman's (2009) work, and previous food values literature, we delve into how political ideology shapes heterogeneity for food values. By adding political ideology as a predictor, we delve into the psychographic antecedents of consumer heterogeneity toward food values (Ardebili & Rickertsen, 2023). Overall, this research contributes to the marketing literature by emphasizing the significance of political ideology as a predictor of consumers' heterogeneous food preferences. Besides, our findings underscore the potential of political ideology as a criterion for segmenting the food market.

## 2. Theoretical background

### 2.1. Political ideology and consumer behavior

Marion (2006) defines *ideology* as "a set of shared beliefs integrated into the institutions, committed to action and thus rooted in [material] reality". Political ideology is critical for understanding individuals' behavior as it mirrors several psychographic differences (Jung & Mittal, 2020). Previously, numerous studies focused on conservatism as a measure of political ideology (Jost, 2006; Kaikati et al., 2017; Kidwell et al., 2013). Conservatism relates to individuals' inclination to preserve the status quo or maintain established traditions.

Political ideology impacts consumer preference for different goods or product attributes. For example, political ideology relates to product attributes judgment, with conservatives being less price sensitive and infer quality based on price (Chan & Ilicic, 2019; Lalwani & Forcum, 2016). Conservatives prioritize utilitarian over hedonic goods (Farmer et al., 2021), and value the functionality of the goods they purchase (Chan, 2020). In contrast, liberals seek global consumption experiences, while conservatives prefer local experiences (Buechner et al., 2022; Rogers & Jost, 2022). Conservatives favor luxury products, especially when the goal of maintaining status is activated (Kim et al., 2018). However, when such status is not activated, conservatives may lean toward inferior products (Lisjak and Ordabayeva, 2022).

Existing literature provides evidence of the negative relationship between conservatism and pro-social or pro-environmental aspects. Conservatives tend to exhibit less concern for corporate social responsibility and unfair treatment of employees (Jasinenko et al., 2020; Maxwell-Smith et al., 2020). Conservatism negatively relates to green consumption values (Mathur & Moschis, 2022), preferences for pro-environmental consumption labels (Gromet et al., 2013), and intention to recycle (Kidwell et al., 2013). Yet, there is research that shows that conservatism is positively related to concern for the climate (Skalski et al., 2022). Specifically, Hardisty et al. (2010) show that when green product attributes are framed as offsets (vs. as taxes), conservatives demonstrate a higher willingness to pay. In contrast, when green product attributes are framed as assets, conservatives are less willing to pay more.

Political ideology influences food preferences and food choices. Conservatives tend to place less importance on pro-social and pro-environmental labels, such as fair trade and green identity (Gohary et al., 2023; Lin & Nayga, 2022). Boeuf (2019) reports no significant differences between liberals and conservatives in perceived health risks associated with food. Utilizing the food-related lifestyles instrument (Brunso and Grunert, 1998), Witzling and Shaw (2019) postulate that liberals are more likely to cook frequently and try new dishes or recipes, while conservatives value convenience and lower prices. Differences between conservatives and liberals also extend to food-related personality traits (Guidetti et al., 2022). Conservatives exhibit higher levels of neophobia (i.e., aversion towards unfamiliar food; see Guidetti et al., 2022), due to their aversion towards foreigners. Conservatives further

demonstrate higher levels of gluten avoidance (Malone & Bailey Norwood, 2020). In terms of food waste, Mas, Haws, and Goldsmith (2022) find that liberals are more inclined to reduce food waste. Concerning food policies, conservatives generally favor fewer regulations and place less emphasis on food safety, quality, and health (Lusk, 2012), while liberals tend to support animal welfare legislation (Bovay & Sumner, 2019). Nonetheless, there is some convergence of opinion on certain policy issues, including food safety and local food (Biedny et al., 2020).

### 2.2. Food values

Lusk and Briggeman (2009) introduced the concept of *food values* as meta-attributes that capture consumer preferences beyond contextual effects. Drawing from human values and the means-end chain theory, food values represent individuals' beliefs about the relative importance of various outcomes resulting from food purchase and consumption. The food values encompass naturalness, taste, price, safety, convenience, nutrition, tradition, origin, fairness, appearance, and environmental impact.

Food values can predict consumers' food and retail channel choices (Lusk, 2011). For instance, consumers who prioritize naturalness and healthiness demonstrate increased demand for organic and functional foods, respectively (Lusk et al., 2014; Lusk & Briggeman, 2009; Pappalardo & Lusk, 2016). Contrarily, consumers valuing price and convenience demonstrate a lower demand for organic food (Lusk et al., 2014; Lusk & Briggeman, 2009). Consumers who appreciate naturalness may express aversion toward food technologies perceived as "interventions" (Lusk et al., 2014; Yang & Hobbs, 2020). Environmental impact as a food value negatively associates with gene-edited food products, but positively related to alternative meat and milk consumption (Sun et al., 2023; Vasquez et al., 2022). Convenience is linked to support for genetically modified food and brand love for fast-food retailers (Izquierdo-Yusta et al., 2022; Vasquez et al., 2022). Preference for pro-environmental and pro-social food labels positively relates to fairness, environmental impact, tradition, and nutrition and negatively to taste and price (Piracci et al., 2022, 2023).

The main advantage of food values as a measurement construct is its stability and independence from contextual conditions. Research suggests that consumer inclinations toward food values demonstrate a consistent pattern over time (Cerroni et al., 2021; Ellison et al., 2021). Even the disruptions brought on by the Covid-19 pandemic made only slight shifts in the ranking of food values, underscoring their resilience (Cerroni et al., 2021; Ellison et al., 2021). In contrast, preferences for specific labels like organic or non-GMO are more susceptible to external influences, such as institutional trust and knowledge (Giannakas, 2002; Gustafson et al., 2016) or market developments. Moreover, consumers reveal similar evaluations of food values in North America and Europe (e.g., food safety ranks among the most important attributes; see Bazzani et al., 2018; Lusk & Briggeman, 2009; Yang & Hobbs, 2020). Thus, food values are stable, allowing for consistent evaluations.

### 2.3. Research aim

In light of the evidence presented, we conclude that political ideology plays a significant role in explaining heterogeneity in food preferences among consumers. Political ideology influences the marketplace as a sub-cultural identity, acting as an umbrella characteristic encapsulating variations in personality, values, and other factors (Jung & Mittal, 2020). As a result, political ideology serves as a valuable guide for shaping consumer behavior and informing strategic decisions. Consequently, it can be effectively utilized as a segmentation variable in marketing and policy efforts. Besides, differences in political ideology manifest in varying preferences and attitudes towards food labels (e.g., fair trade or non-GMO), food-related attitudes (e.g., convenience, safety), and behavioral intentions (Gohary et al., 2023; Lusk, 2012; Mas et al., 2022; Witzling & Shaw, 2019).

In contrast to food values, such inclinations (e.g., preferences for food labels) may hinge on contextual factors (Giannakas, 2002; Gustafson et al., 2016), such as trust in certification agencies or the depth of knowledge—and might shift. Thus, recognizing the interplay between political ideology and food values offers insights into more enduring patterns by uncovering the underlying mechanism that drives differences in food preferences. Discerning this nexus will help understand why consumers with different political leanings express heterogeneous preferences for ethically produced goods, local food, and ecolabels.

### 3. Conceptual framework

Drawing from prior marketing research, we adopt conservatism as the metric for political ideology (Kidwell et al., 2013; Farmer et al., 2020, 2021; Lisjak & Ordabayeva, 2022). Conservatism encompasses beliefs that resist progressive social shifts (Becker, 2020; Everett, 2013). For instance, conservatives often contest rights for the LGBT community, the welfare state, and illegal immigration. However, they typically support capital punishment, oppose abortion, and advocate for curbing illegal immigration. This ideology often intersects with authoritarianism and system justification (Nilsson & Jost, 2020), religiosity (Stankov, 2021), populism (Annisson & Guiney, 2022), and backing for right-wing political factions (Osborne & Sibley, 2020).

In accordance with Lancaster's (1966) theory of consumption, we posit that consumers derive utility from product characteristics rather than the product itself. Consequently, when purchasing a food product, consumers assign utility to a set of characteristics, which, in our study, are represented by food values (Lusk & Briggeman, 2009). Furthermore, we acknowledge that consumer preferences vary among individuals (Lancaster, 1966; Mueller Loose & Lockshin, 2013). As a result, we anticipate that consumers will demonstrate heterogeneous preferences for food values, in line with findings from previous studies (Lusk & Briggeman, 2009; Yang et al., 2021). Demographic characteristics drive heterogeneity towards food values. For instance, highly educated consumers and consumers with children in their households express a stronger preference for nutrition and are less price sensitive (Bazzani et al., 2018). Recent studies also delve into the psychographic drivers of heterogeneity towards food values. For instance, consumers who prefer more sustainable food values (such as fairness and environmental impact) tend to have a moral and pro-environmental social identity (Piracci et al., 2023). Besides, preference for such sustainability-related food values is further driven by openness to experience, agreeableness, and extraversion personality traits (Ardebili & Rickertsen, 2023).

Although our study is exploratory, we bring forward propositions regarding expected results. Thus, we posit that political ideology can serve as a predictor for consumer heterogeneity in preferences for food values. More specifically, we anticipate that conservatives will exhibit aversion towards taste, price, environmental impact, and fairness (Farmer et al., 2021; Gohary et al., 2023; Mas et al., 2022). Conversely, we expect that conservatives will assign greater utility to convenience, tradition, and origin (Buechner et al., 2022; Farmer et al., 2021; Rogers & Jost, 2022).

## 4. Materials and methods

### 4.1. Questionnaire design

We developed a questionnaire organized into three sections besides socio-demographics. In the first section, we assessed the importance of food values using the Best Worst Scaling (BWS) method. BWS is a scaling method where respondents evaluate the attributes of a product by comparing them to each other (Louviere et al., 2013). BWS offers the distinct advantage of reducing biases (Lee et al., 2008). Additionally, it is a favored method for gauging food value preferences and is adept at assessing consumer trade-offs (Bazzani et al., 2018; Cerroni et al., 2021; Lusk & Briggeman, 2009; Piracci et al., 2023). We constructed Best-

Worst Scaling (BWS) choice sets using a Balanced Incomplete Block Design (BIBD). This design (denoted as 11, 5, 5, 2) arranged the 11 food values across 11 choice sets, with each food value appearing 5 times, each choice consisting of five food values, and each food value appearing twice with another. We further randomized the order of the sets for each participant to minimize possible order effects. For each set, respondents stated the food value they consider the most and the food value they consider the least important for their food purchases. Fig. 1 showcases a sample choice set. A comprehensive design of all sets can be found in the Supplementary Materials (SM). The questionnaire was part of a larger study and included other sections that we do not report in this study. The Best-Worst choice sets preceded these sections, while there were no experimental conditions that would likely influence the results reported in this study.

In the second section, we assessed political ideology in two different ways. First, we adapted the scale of conservatism (Kidwell et al., 2013; Nail et al., 2009), asking consumers to state their level of agreement with a 7-item scale (anchored from 1 = totally disagree to 7 = totally agree): 1) Capital punishment for severe crimes; 2) Abortion should be a criminal offence; 3) Socio-political activism is an important part of democracy (R); 4) Education should be public and free (R); 5) Same-sex marriage should be legal (R); 6) Illegal immigration should be stopped; and 7) Leftist activism is a problem. Higher scores on this scale reflect a more conservative ideology (Kidwell et al., 2013). Given that conservative beliefs differ across cultures (Lindqvist & Dornschneider-Elkink, 2023), we made adaptations to the scale items and points to better resonate with the political discourse in Greece, in which the empirical data collection took place.

Second, we assessed right-wing political ideology as a single-item measure (Jost, 2006), asking respondents to state their political ideology anchored from 1 = very left-wing to 7 = very right-wing. To understand these alignments better, we gauged respondents' right-wing political affiliation on a 6-point scale (1 = anarchist; 2 = communist; 3 = socialist; 4 = liberal; 5 = patriot; 6 = nationalist). Previous studies have identified the political affiliations of Greeks oriented towards the left, center, and right. Those on the far left often resonate with anarchist or communist beliefs (Gerodimos, 2015; Halikiopoulou et al., 2012). In contrast, those leaning strongly to the right tend to identify with patriotic and nationalist sentiments (Halikiopoulou et al., 2012). Those in the center-left and center-right spheres typically align with socialism and liberalism, respectively (Rodríguez-Pose et al., 2016). It should further be noted that being liberal in Greece is associated with a right-wing ideological affiliation.

In the third section, we assessed green consumption values (Haws et al., 2014). We asked respondents to state their level of agreement with a 7-item scale (anchored from 1 = totally disagree to 7 = totally agree): 1) It is important to me that the products I use do not harm the environment; 2) I consider the potential environmental impact of my actions when making many of my decisions; 3) My purchase habits are affected by my concern for our environment; 4) I am concerned about wasting the resources of our planet; 5) I would describe myself as environmentally responsible; 6) I am willing to be inconvenienced in order to take actions that are more environmentally friendly.

### 4.2. Participants and sampling

We chose Greece as the study area. Greece presents an interesting case of measuring the effect of political ideology due to the polarizing nature of Greek politics. Over several decades, Greece has maintained a deeply politically divided landscape between left-wing/ progressive and right-wing/ conservative ideologies (Andreadis & Stavrakakis, 2019). This polarization further intensified during the economic crisis of 2011, resulting in a pronounced dichotomy between the political right and left (Andreadis & Stavrakakis, 2019). This political divide manifests itself across numerous contemporary issues, as Greek conservatives exhibit a propensity for skepticism towards science (Rutjens et al., 2022),

Which of the following attributes is the most important and which is the least important when you purchase food? Tick the ONE attribute that MOST influences your choice and the ONE that LEAST influences your choice:

| LEAST IMPORTANT       | ATTRIBUTES  | MOST IMPORTANT        |
|-----------------------|---|-----------------------|
| <input type="radio"/> | <b>Taste</b><br>(extent to which consumption of the food is appealing to the senses)                        | <input type="radio"/> |
| <input type="radio"/> | <b>Price</b><br>(the price that is paid for the food)   | <input type="radio"/> |
| <input type="radio"/> | <b>Tradition</b><br>(preserving traditional consumption patterns)   | <input type="radio"/> |
| <input type="radio"/> | <b>Fairness</b><br>(the extent to which all parties involved in the production of the food equally benefit) | <input type="radio"/> |
| <input type="radio"/> | <b>Environmental impact</b><br>(effect of food production on the environment)                               | <input type="radio"/> |

Fig. 1. Example of a choice set presented to participants.

negative attitudes towards LGBT community (Grigoropoulos, 2019), blame international institutions for global crises (Davvetas et al., 2022), and exhibit higher trust towards Greek institutions (Massou et al., 2022). In Greece, similarly to other Western European countries, conservatism is correlated with right-wing political orientation (Aspelund et al., 2013). However, the liberal-progressive/ conservative continuum does not always overlap with the left/ right continuum (Caprara, 2020). Conservatism denotes an opposition to liberty, while right-wing ideology denotes an opposition to equality. Furthermore, Greece's underrepresentation in analogous studies exploring food values or the role of political ideology in marketing further emphasizes the significance of including it as a research context.

The study was approved by the university's ethics committee board of the last author's affiliation and pre-registered ([https://aspredicted.org/63T\\_HDH](https://aspredicted.org/63T_HDH)). The results presented in this paper are the result of exploratory analysis as described in the protocol. To ensure transparency, we make available the primary data, the syntax, and a file with supplementary materials at [https://osf.io/ym8zh/?view\\_only=49e1baab7327443dad9e9f974e83393a](https://osf.io/ym8zh/?view_only=49e1baab7327443dad9e9f974e83393a). We collected data ( $N = 637$ ) during November 2022 through an online survey administered by Qualtrics panel services in Greece. We further set quotas for gender and age. Following the exclusion of participants whose responses contained missing values, 637 individuals were incorporated into the formal

**Table 1**  
Characteristics of the sample ( $N = 637$ ).

|  | N/Mean | %/SD |
|--|--------|------|
| <b>Gender</b>                                  |        |      |
| Male   | 321    | 50.4 |
| Female   | 316    | 49.6 |
| <b>Education</b>                               |        |      |
| Less than university                           | 212    | 33.3 |
| University                                     | 425    | 66.7 |
| <b>Responsible for household groceries</b>     |        |      |
| Yes  | 604    | 5.2  |
| No   | 33     | 94.8 |
| <b>Children in the household</b>               |        |      |
| Yes  | 245    | 38.5 |
| No   | 392    | 61.5 |
| <b>Age (mean)</b>                              | 45.0   | 15.0 |
| <b>Right-wing political ideology (mean)</b>    | 4.1    | 0.5  |
| <b>Right-wing political affiliation (mean)</b> | 3.9    | 1.1  |
| <b>Conservatism (mean)</b>                     | 3.9    | 0.5  |
| <b>Green consumption values (mean)</b>         | 3.6    | 0.8  |

analysis. The characteristics of the sample are presented in Table 1.

To increase the reliability of the conservatism scale we removed the fourth item that was negatively related to other items (see Table A2 in Supplementary Materials).<sup>1</sup> The mean score of the conservatism scale ( $\alpha = 0.64$ ) is 3.9 ( $SD = 1.2$ ), of right-wing political ideology is 4.1 ( $SD = 0.5$ ), of right-wing political affiliation is 3.9 ( $SD = 1.1$ ), and of green consumption values ( $\alpha = 0.89$ ) is 3.6 ( $SD = 0.8$ ). Following Nail et al. (2009) and Kidwell et al. (2013), we tested whether conservatism correlates with right-wing political ideology and affiliation measures. Conservatism shows a moderate positive correlation with right-wing political ideology ( $r = 0.433, p < .001$ ), and right-wing political affiliation ( $r = 0.471, p < .001$ ). Conservatism shows a slight negative correlation with green consumption values ( $r = -0.187, p < .001$ ).

#### 4.3. Data analysis

To elicit the utility that respondents attach to food values, we use the Random Utility Theory (RUT) framework (McFadden, 1973), that fits with BWS data (Louviere et al., 2013). RUT framework offers fewer biases than other analytical approaches, such as the count method (Louviere et al., 2015). RUT assumes the utility to consist of an observable and unobservable component. In such models, respondents are presented with  $T$  choice sets of  $J$  items each, and are asked to choose the pair of items that maximizes the difference between the best and the worst choice for choice set  $t$  (Finn & Louviere, 1992) as follows:  $U_{jt} = \lambda_{jt} - \lambda_{kt} + \varepsilon_{ijt}$ . Where  $\lambda_{jt}$  and  $\lambda_{kt}$  are the vectors of the best and worst food values' estimated importance parameters against a reference food value normalized to zero. Those parameters account for the observable deterministic component of indirect utility, while the error term  $\varepsilon_{ijt}$  is considered an unobservable stochastic component. Therefore, the probability that a respondent will choose a combination that maximizes the difference in utility between the  $j$  best and  $k$  worst choices ( $U_{jt} - U_{kt}$ ) is greater than any other possible utility difference with each choice set  $t$  (Lusk & Briggeman, 2009).

By recognizing that consumers do not have uniform preferences (Lancaster, 1966; Lusk & Briggeman, 2009), we utilize a Random Parameters Model that accounts for individual heterogeneity and estimates the deterministic component of utility for each food value, treating it as

<sup>1</sup> After subtracting the fourth item, Cronbach's alpha increased from 0.61 to 0.64.

a random vector. Such a model allows differences across individuals to vary randomly, thus resembling reality. Prior studies in the food values literature have utilized RPL models (Bazzani et al., 2018; Cerroni et al., 2021; Lusk & Briggeman, 2009). For this econometric model, we assume that the error term  $\varepsilon_{ijt}$  is i.i.d. type I extreme value and the importance parameters  $\lambda_{ij}$  and  $\lambda_{ik}$  follow a normal distribution. The density of importance parameters is  $f(\lambda_i)$  and the unconditional probability that a respondent  $i$  selects  $j$  as best and  $k$  as worst is given by the following equation:

$$P_{ij} = \int_{\lambda} \prod_{l=1}^T \frac{e^{(\lambda_{ijl} - \lambda_{ikl})}}{\sum_{l=1}^J \sum_{m=1}^J e^{(\gamma_{lit} - \gamma_{iml}) - J} f(\lambda_i)} d\lambda_i.$$

We use 500 Halton draws to estimate the parameters of the model through the simulated maximum likelihood technique. Following Lusk and Briggeman (2009), we further calculate the share of preference  $Y$  for each attribute:

$$Y_j = \frac{e^{\lambda_j}}{\sum_{k=1}^J e^{\lambda_k}}.$$

The shares of preference of food values sum up to one. This way, we get easier interpreted results. Moreover, we can use the individual-specific estimates of the RPL model to provide the shares of preferences for each individual. Therefore, we can provide highly disaggregated results for each individual  $i$ , that can be used to trace the effect of political ideology. We compute the previous using the “mlogit” R package.

Following Caputo and Lusk (2020), we use a fractional multinomial logit model (Papke & Wooldridge, 1996) to estimate the effect of political ideology on the shares of preferences of food values. A benefit of FML model is that FML is suitable for modeling multiple shares of individual preferences, as each dependent variable  $y_{ij}$ , for individual  $i$  and food value  $j$ , takes values in the interval [0,1] and they sum up to one. FML model takes the following form (Caputo & Lusk, 2020):

$$y_{nj} = \frac{e^{\alpha_j x_i}}{1 + \sum_{m=1}^{M-1} \alpha_m x_i}$$

FML analysis needs a baseline dependent variable coefficient to be normalized to zero, which is the coefficient  $\alpha_1$ . We choose appearance as the first dependent variable. We also include green consumption values (Haws et al., 2014) and demographic characteristics (gender, education, age, responsible for household groceries, children in the household) in our model as control variables. Green consumption values are related to food attitudes and behavior (Alagarsamy et al., 2021; Gunden et al., 2020). Green consumption values show a better prediction of consumers’ environmental preferences compared to similar constructs, such as ecologically conscious consumer behavior or the socially responsible purchase and disposal measure (Haws et al., 2014). In previous studies, demographic characteristics are found to drive consumer heterogeneity for food values (Bazzani et al., 2018; Cerroni et al., 2021). For our analysis, we follow a stepwise approach. In the first step, we include only conservatism as an independent variable, and in the second step, we further include the control variables. We compute the FML model in STATA 17.0.

## 5. Results

### 5.1. Random parameters logit model results

Table 2 reveals the relative importance of food values. To choose the baseline attribute for the RPL model, we first used the count method (Mueller Loose & Lockshin, 2013) to estimate which food value gets the lowest score (Table A3, Supplementary Materials). All food values significantly differ from the baseline (appearance) at a 0.001% significance level. All food values get significant standard deviations at a

**Table 2**  
Random Parameters Logit estimates and individual shares of preference.

| Food values          | Econometric estimates (RPL) |                      | Shares of preference |
|----------------------|-----------------------------|----------------------|----------------------|
|                      | Mean                        | SD                   |                      |
| Safety               | 3.118 (0.056)<br>***        | 1.520 (0.057)<br>*** | 26.8% [0.220]        |
| Nutrition            | 2.611 (0.054)<br>***        | 1.094 (0.051)<br>*** | 14.4% [0.121]        |
| Taste                | 2.498 (0.053)<br>***        | 1.107 (0.052)<br>*** | 13.2% [0.121]        |
| Price                | 2.493 (0.054)<br>***        | 1.862 (0.056)<br>*** | 18.3% [0.019]        |
| Naturalness          | 1.956 (0.052)<br>***        | 1.372 (0.052)<br>*** | 9.6% [0.112]         |
| Environmental impact | 1.551 (0.051)<br>***        | 1.124 (0.052)<br>*** | 5.8% [0.049]         |
| Fairness             | 1.159 (0.049)<br>***        | 0.855 (0.054)<br>*** | 3.2% [0.031]         |
| Origin               | 1.059 (0.046)<br>***        | 1.104 (0.049)<br>*** | 3.5% [0.032]         |
| Tradition            | 0.741 (0.049)<br>***        | 0.969 (0.055)<br>*** | 2.3% [0.025]         |
| Convenience          | 0.505 (0.048)<br>***        | 0.906 (0.056)<br>*** | 1.8% [0.019]         |
| Appearance           | –                           | –                    | 1.0% [0.005]         |
| Log-likelihood       | –16525                      |                      |                      |
| R <sup>2</sup>       | 0.21                        |                      |                      |

Note: Numbers in parentheses are standard errors and numbers in brackets are standard deviations. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

0.001% significance level. Therefore, consumer preferences are highly heterogeneous at an individual level. To provide more intuitive results (Lusk & Briggeman, 2009), we further estimate the shares of preference by using the coefficients of the RPL model. The most important food value is safety (25.6), price (17.8), nutrition (14.7), taste (13.3), and naturalness (9.6). The least important food values are environmental impact (5.9), origin (3.7), fairness (3.5), tradition (2.5), convenience (2.1), and appearance (1.1).

### 5.2. Fractional multinomial logit model results

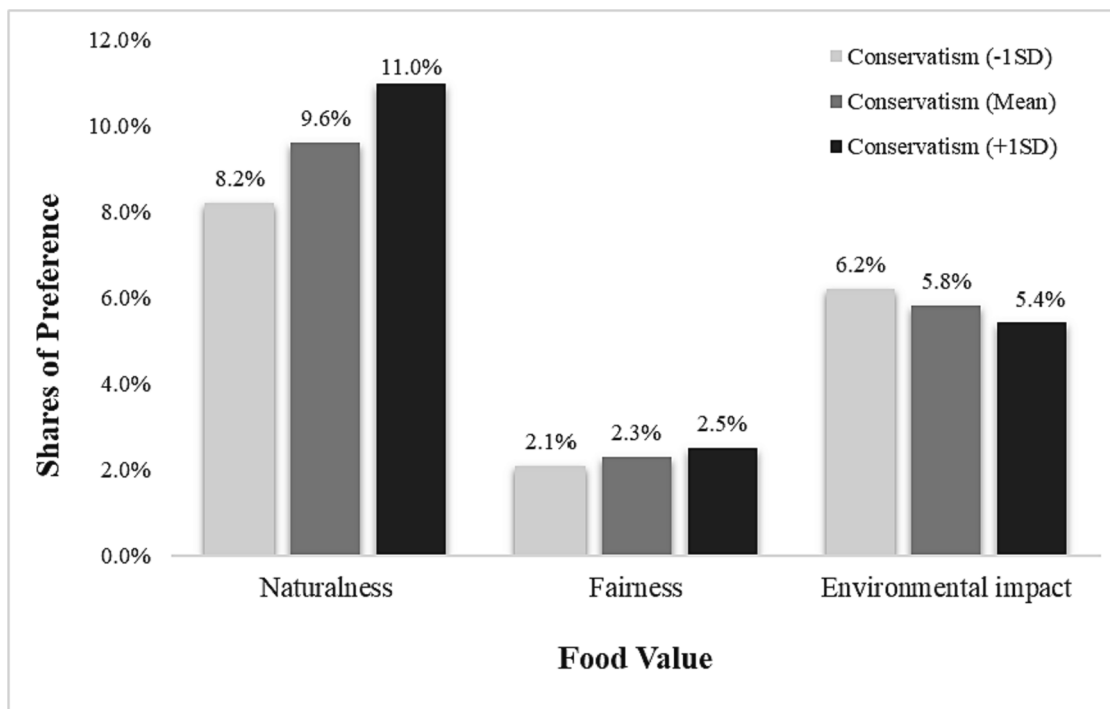
We present the marginal effects of the FML model in Table 3. In the first step, conservatism is positively related to naturalness ( $\beta = 0.014$ ,  $p < 0.01$ ) and tradition ( $\beta = 0.002$ ,  $p < 0.05$ ), and negatively to environmental impact ( $\beta = -0.006$ ,  $p < 0.05$ ). In the second step, conservatism is positively related to naturalness ( $\beta = 0.013$ ,  $p < 0.01$ ) and tradition ( $\beta = 0.002$ ,  $p < 0.10$ ), and negatively to environmental impact ( $\beta = -0.004$ ,  $p < 0.10$ ). To demonstrate the magnitude of the effects better, we present in Fig. 2 the change in the shares of preference, when conservatism increases from one standard deviation below the mean to one standard deviation above. The percentage of respondents that evaluate naturalness as the most important food value increases from 8.2% to 11.0%. The percentage of respondents that evaluate tradition as the most important food value increases from 2.1% to 2.5%. Finally, the percentage of respondents that evaluate environmental impact as the most important food value decreases from 6.2% to 5.4%.

Green consumption values are negatively related to price ( $\beta = -0.044$ ,  $p < 0.01$ ) and positively to nutrition ( $\beta = 0.011$ ,  $p < 0.10$ ), fairness ( $\beta = 0.003$ ,  $p < 0.05$ ), and environmental impact ( $\beta = 0.027$ ,  $p < 0.01$ ). Our results further indicate a relationship between demographic characteristics and the relative importance of food values. Female is positively related to safety ( $\beta = 0.044$ ,  $p < 0.05$ ) and negatively to naturalness ( $\beta = -0.019$ ,  $p < 0.05$ ). A university degree is negatively related to convenience ( $\beta = -0.004$ ,  $p < 0.05$ ) and environmental impact ( $\beta = -0.014$ ,  $p < 0.05$ ). Older age is positively related to safety ( $\beta = 0.002$ ,  $p < 0.05$ ) and negatively to taste ( $\beta = -0.001$ ,  $p < 0.01$ ), convenience ( $\beta = -0.000$ ,  $p < 0.05$ ) and fairness ( $\beta = -0.000$ ,  $p < 0.10$ ). Being responsible for household groceries is

**Table 3**  
Multinomial fractional logit model marginal effects (conservatism).

|                                     | Naturalness                             | Taste                                    | Price                                    | Safety                                  | Convenience                              | Nutrition                             | Tradition                              | Origin            | Fairness                              | Environmental impact                    |
|-------------------------------------|---|--|--|---|--|---------------------------------------|--|-------------------|---------------------------------------|---|
| <b>Step 1</b>                       |   |  |  |   |  |                                       |  |                   |                                       |   |
| Conservatism                        | <b>0.014</b><br>( <b>0.005</b> )<br>*** | -0.002<br>(0.004)                        | -0.002<br>(0.008)                        | -0.004<br>(0.007)                       | 0.000<br>(0.001)                         | -0.003<br>(0.004)                     | <b>0.002</b><br>( <b>0.001</b> ) **    | 0.002<br>(0.001)  | -0.001<br>(0.001)                     | <b>-0.006</b><br>( <b>0.002</b> )<br>** |
| <b>Step 2</b>                       |   |  |  |   |  |                                       |  |                   |                                       |   |
| Conservatism                        | <b>0.013</b><br>( <b>0.004</b> )<br>*** | -0.000<br>(0.004)                        | -0.008<br>(0.007)                        | -0.003<br>(0.008)                       | 0.000<br>(0.001)                         | -0.001<br>(0.005)                     | <b>0.002</b><br>( <b>0.001</b> )<br>*  | 0.002<br>(0.002)  | -0.001<br>(0.001)                     | <b>-0.004</b><br>( <b>0.002</b> )<br>*  |
| Green consumption values            | 0.007<br>(0.006)                        | -0.008<br>(0.006)                        | <b>-0.044</b><br>( <b>0.011</b> )<br>*** | 0.005<br>(0.010)                        | -0.001<br>(0.001)                        | <b>0.011</b><br>( <b>0.006</b> )<br>* | -0.000<br>(0.001)                      | 0.001<br>(0.002)  | <b>0.003</b><br>( <b>0.002</b> )<br>* | <b>0.027</b><br>( <b>0.005</b> )<br>*** |
| Female                              | <b>-0.019</b><br>( <b>0.009</b> )<br>** | 0.002<br>(0.009)                         | -0.013<br>(0.017)                        | <b>0.044</b><br>( <b>0.017</b> ) **     | -0.002<br>(0.002)                        | -0.005<br>(0.010)                     | -0.002<br>(0.002)                      | -0.001<br>(0.003) | -0.001<br>(0.002)                     | -0.002<br>(0.005)                       |
| University                          | 0.008<br>(0.009)                        | 0.009<br>(0.010)                         | -0.025<br>(0.018)                        | 0.019<br>(0.019)                        | <b>-0.004</b><br>( <b>0.002</b> )<br>**  | 0.014<br>(0.011)                      | -0.002<br>(0.002)                      | -0.003<br>(0.004) | -0.003<br>(0.002)                     | <b>-0.014</b><br>( <b>0.006</b> )<br>** |
| Age                                 | -0.000<br>(0.000)                       | <b>-0.001</b><br>( <b>0.000</b> )<br>*** | 0.000<br>(0.001)                         | <b>0.002</b><br>( <b>0.001</b> ) **     | <b>-0.000</b><br>( <b>0.000</b> )<br>*** | -0.000<br>(0.000)                     | <b>-0.000</b><br>( <b>0.000</b> )<br>* | -0.000<br>(0.000) | <b>-0.000</b><br>( <b>0.000</b> ) *   | -0.000<br>(0.000)                       |
| Responsible for household groceries | 0.014<br>(0.022)                        | <b>-0.049</b><br>( <b>0.022</b> )<br>**  | -0.031<br>(0.035)                        | <b>0.053</b><br>( <b>0.043</b> )        | 0.003<br>(0.003)                         | -0.036<br>(0.022)                     | 0.005<br>(0.004)                       | 0.008<br>(0.008)  | <b>0.008</b><br>( <b>0.004</b> ) *    | <b>0.025</b><br>( <b>0.010</b> )<br>**  |
| Children in the household           | 0.014<br>(0.009)                        | 0.013<br>(0.009)                         | 0.001<br>(0.017)                         | <b>-0.045</b><br>( <b>0.018</b> )<br>** | <b>0.004</b><br>( <b>0.002</b> )<br>**   | 0.013<br>(0.010)                      | 0.002<br>(0.002)                       | -0.001<br>(0.004) | 0.003<br>(0.003)                      | -0.005<br>(0.006)                       |

Note: Numbers in parentheses are sd. errors. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



**Fig. 2.** The shares of preference of food values when conservatism increases from -1SD below to +1SD above the mean.

positively related to fairness ( $\beta = 0.008$ ,  $p < 0.10$ ) and environmental impact ( $\beta = 0.025$ ,  $p < 0.05$ ) and negatively related to taste ( $\beta = -0.049$ ,  $p < 0.05$ ). Household with children is positively related to convenience ( $\beta = 0.004$ ,  $p < 0.05$ ), and negatively related to safety ( $\beta = -0.045$ ,  $p < 0.05$ ). We further present the results of the model estimates (Table A4, Supplementary Materials).

### 5.3. Additional analyses

As additional analyses, we calculated the FML model by first replacing conservatism with right-wing political ideology, and second with right-wing political affiliation (see Tables A4 and A5 in supplementary materials). The reason behind these analyses was to check whether other measures of political ideology we used in the survey

provide similar associations with heterogeneous consumer preferences toward food values. The marginal effects analysis of the first model revealed that right-wing political ideology is negatively related to price ( $\beta = -0.014$ ,  $p < 0.05$ ) and positively related to convenience ( $\beta = 0.001$ ,  $p < 0.05$ ) and tradition ( $\beta = 0.002$ ,  $p < 0.05$ ). The marginal effects of the second model revealed that right-wing political affiliation is negatively related to price ( $\beta = -0.017$ ,  $p < 0.10$ ) and positively to naturalness ( $\beta = 0.012$ ,  $p < 0.01$ ) and tradition ( $\beta = 0.003$ ,  $p < 0.05$ ).

## 6. Discussion

In Greece, consumers regard safety as the paramount food value, followed by nutrition, price, taste, and naturalness. This prioritization of safety aligns with findings from the USA, Canada, China, Norway, and Italy, where safety consistently ranks as the most important, or among the most crucial, food value (Bazzani et al., 2018; Cerroni et al., 2021; Izquierdo-Yusta et al., 2022; Sun et al., 2023; Yang & Hobbs, 2020). Additionally, nutrition, price, taste, and naturalness consistently emerge as top food values in these countries (Bazzani et al., 2018; Cerroni et al., 2021; Izquierdo-Yusta et al., 2022; Lusk et al., 2009; Yang & Hobbs, 2020). Nevertheless, some contradictory findings exist; for instance, Italian and Mexican consumers assign lower importance to nutrition as a food value (Bazzani et al., 2018; Pappalardo and Lusk, 2016; Piracci et al., 2022), while Chinese and Norwegian consumers place less emphasis on price (Sun et al., 2023). Intriguingly, Greek consumers exhibit a preference structure akin to North American consumers (see Bazzani et al., 2018; Yang & Hobbs, 2020).

Our findings demonstrate that political ideology is associated with heterogeneous consumer preferences regarding food values. Conservatives exhibit a predilection for naturalness and tradition in food products, aligning with prior research indicating conservatives' inclination towards local experiences, balance, order, and avoidance toward uncertainty (Buechner et al., 2022; Lisjak & Ordabayeva, 2022; Jost et al., 2003). However, we contradict a previous study that found a correlation between conservatism and naturalness (Wilks et al., 2019). We propose that these contradictory findings are linked to cultural differences. Conversely, conservatives display less concern for the environmental impact of food. This is consistent with previous studies that have identified a negative relationship between conservatism and environmentally friendly behavior (Gromet et al., 2013; Kidwell et al., 2013).

Our findings further reveal that green consumption values contribute to consumer heterogeneity in food values. Consumers with high green consumption values display a preference for naturalness, nutrition, origin, fairness, and environmental impact. On the other hand, these consumers exhibit less concern for price. Our results support previous research that identified a preference for food with sustainable logistics among consumers high in green consumption values (Alagarsamy et al., 2021), and an inclination toward healthy and environmentally friendly eating (Gunden et al., 2020). However, our findings challenge the work of Haws et al. (2014), who reported a relationship between green consumption values and price consciousness. This difference might be attributed to our research design incorporating trade-offs between food attributes.

The relationships between demographic characteristics and food values corroborate findings from previous studies (Bazzani et al., 2018; Cerroni et al., 2021). For instance, prior research has demonstrated that older consumers prioritize safety (Bazzani et al., 2018; Cerroni et al., 2021). Our findings support Cerroni et al. (2021) in that females prioritize safety; however, we present a contrasting result, as our data indicates that females value naturalness less, diverging from previous studies (Cerroni et al., 2021). We also found that households with children assign less importance to safety and more to convenience, which contradicts earlier research (Bazzani et al., 2018; Cerroni et al., 2021). Such deviations might relate to contextual differences. University education is negatively associated with convenience and environmental impact, a result consistent with Bazzani et al. (2018) but inconsistent

with Cerroni et al. (2021). Additionally, being responsible for household groceries is negatively related to taste and positively to safety, fairness, and environmental impact.

The results of additional analyses reveal commonalities and some differences compared to the main model. Tradition is positively related to conservatism, right-wing political ideology, and right-wing political affiliation. Both conservatism and right-wing ideology are related to traditional values (Lauriola et al., 2015; Oyserman & Schwarz, 2017), and these associations expand to food values preferences. Naturalness is associated with both conservatism and right-wing political affiliation. An interesting result is that price is negatively related to both right-wing political ideology and right-wing political affiliation, but not with conservatism. Previous studies have found that conservatism is negatively related to price sensitivity (Chan & Ilicic, 2019) and price quality judgments (Lalwani & Forcum, 2016). Both conservatism and power distance beliefs are concepts closely related to right-wing political ideology (Aspelund et al., 2013; Osborne & Sibley, 2020; Travaglino & Moon, 2023). However, in our study conservatism is not related to price, perhaps due to cultural differences. Right-wing political ideology is also related to convenience. As far as we are concerned, previous studies did not reveal an association between political ideology and consumer preference for convenience. The fact that the relationships between conservatism, right-wing political ideology, and right-wing political affiliation with food values do not totally overlap, highlights that despite their close association (Aspelund et al., 2013; Osborne & Sibley, 2020) these measures are conceptually different (Caprara, 2020).

## 7. Conclusions

Our research builds upon and contributes to the existing marketing literature on political ideology and its influence on heterogeneous consumer preferences (Buechner et al., 2022; Farmer et al., 2021; Schoenmueller et al., 2023; Shepherd et al., 2015). Our central finding suggests that political ideology acts as a polarizing force within the food market, paralleling its effects on brand preferences (Schoenmueller et al., 2023; Shepherd et al., 2015), hedonic versus utilitarian consumption (Farmer et al., 2021), and local versus global experiences (Buechner et al., 2022). Consequently, our results lend further credence to prior studies that have posited the pervasive and polarizing impact of political ideology on various aspects of society, extending its reach to the food marketplace.

Our study adds to the growing body of literature on food values (Bazzani et al., 2018; Cerroni et al., 2021; Ellison et al., 2021; Lusk & Briggeman, 2009) by providing evidence that both political ideology and green consumption values drive heterogeneous consumer preferences. We contribute to this field by extending the literature on the psychographic drivers of consumer heterogeneity towards food values (Ardebili & Rickertsen, 2023; Piracci et al., 2023). As a result, we underscore the significance of ideological segmentation within the food market. Furthermore, our research supports previous findings that consumer preferences for food values exhibit relative stability across various countries, such as the USA, Canada, China, Mexico, and Norway (Bazzani et al., 2018; Cerroni et al., 2021; Izquierdo-Yusta et al., 2022; Sun et al., 2023; Yang & Hobbs, 2020).

Our study enriches the marketing discourse on political ideology and sustainable consumption, delving into how conservatism correlates with pro-environmental and pro-social food preferences. While earlier research underscored conservatism's negative link to preferences for fair trade and food waste reduction (Mas et al., 2022; Gohary et al., 2023), we found a conservative tilt toward valuing naturalness and tradition in foods. Such values align with sustainable choices like organic or local foods. However, conservatives displayed limited concern for the environmental repercussions of their food habits, echoing past findings on their lesser green engagement (Kidwell et al., 2013; Lin & Nayga, 2022). Thus, conservative and less conservative groups may lean into sustainable choices, with varied motivations. Our work reaffirms the multi-

faceted routes to pro-social and pro-environmental behaviors (Farmer et al., 2020; Kidwell et al., 2013), underscoring the need to comprehend motivations across consumer segments.

### 7.1. Managerial and policy implications

Our research underscores the pivotal role of political ideology in predicting food value preferences. Hence, marketing strategies and policy interventions should integrate this insight. By recognizing how political beliefs mold consumer choices, marketers and policymakers can craft messages that resonate with specific audience segments, amplifying their impact. For example, messaging that stresses tradition may attract conservatives, while environmental benefits might appeal to less conservative consumers. Our findings further highlight the importance of ideological segmentation in the food market. With distinct preferences across ideological lines, marketers need to customize campaigns for conservative and less conservative audiences. Using political ideology for segmentation, proxies like residence and social media habits can refine marketing strategies. This perspective offers a deeper understanding of consumer behavior, enabling the design of contextually apt marketing campaigns and policies catering to varied consumer sensibilities.

For food products emphasizing ethical and sustainability labels, aligning marketing strategies with political ideology is crucial. While environmental credentials might less sway conservatives, they could be drawn to attributes like local origin or traditional labels. Interestingly, they might also opt for less conventionally attractive foods if perceived as 'natural'. Both conservative and less conservative consumers might be enticed by organic products, though with differing motivations. As such, political ideology should guide tailored marketing messages. This extends to novel food products and technologies, where conservatives' preference for naturalness may make them less enthusiastic about innovations like alternative proteins or biotechnology. Recognizing these nuanced preferences, molded by political beliefs, is essential for effective marketing in the evolving food industry.

Drawing from our findings, policymakers can craft impactful behavioral interventions for environmental and health policies. Consumers have differing views on food policies (Lusk, 2012). For instance, conservatives may be wary of pro-environmental measures. To engage such a group, interventions should link greener food systems with local traditions and naturalness. Additionally, conservatives might resist policies endorsing new food technologies or diets. To counter this, emphasize local traditions to bolster pro-environmental and healthy eating initiatives. By recognizing these ideology-driven preferences, policymakers can fine-tune strategies promoting sustainable and healthy eating for diverse consumer groups.

### 7.2. Limitations and future research

Our study has some limitations that point to future research directions. First, our study does not claim causality. To ascertain causal links between political ideology and heterogeneous food preferences, future research should opt for experimental designs or data from actual behavior. Second, although online, our sample is drawn from a professional market agency with a sufficient size, it should not be considered entirely representative of the Greek population. Third, our adapted conservatism scale moderately aligns with right-wing ideology and political affiliation, and its reliability is relatively low contrary to our initial expectations. Nevertheless, we provide evidence on the use of such in a non-US context.

Future research should also study the psychological drivers behind varied food preferences, which may hinge on factors like social order, openness, or need for balance (Farmer et al., 2020, 2021; Lisjak & Ordabayeva, 2022; Rogers & Jost, 2022). Determining if ideological segments display unique buying behaviors, especially concerning ethically labeled food items, would be intriguing. Given our study's

implications on environmental food policies and credence attributes, further research should also analyze how political ideology affects demand for such attributes and products.

### CRedit authorship contribution statement

**Antonios Tiganis:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **Polymeros Chrysochou:** Conceptualization, Methodology, Writing – review & editing. **Athanasios Krystallis:** Conceptualization, Writing – review & editing.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Data availability

Data are available at [https://osf.io/ym8zh/?view\\_only=49e1baab7327443dad9e9f974e83393a](https://osf.io/ym8zh/?view_only=49e1baab7327443dad9e9f974e83393a).

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### Appendix I. Supplementary material

The supplementary material, data, and syntax of this paper can be found at [https://osf.io/ym8zh/?view\\_only=49e1baab7327443dad9e9f974e83393a](https://osf.io/ym8zh/?view_only=49e1baab7327443dad9e9f974e83393a).

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