


Me, us, or the planet: Who comes first? An explanatory analysis of consumer motivation for sustainable food consumption

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ARTICLE INFO

Keywords:

Green consumers
Community-oriented consumption
Environmental drivers
Altruism motivations
Local food
Safety

ABSTRACT

This study examines three key research questions related to altruistic and egoistic motivations for sustainable behavior. It explores whether altruism is an intrinsic characteristic or context-dependent, if the distinction between altruism and egoism should be modeled as a binary or a continuum, and whether a linear or multidimensional approach is more suitable. The study, conducted using data from a sample of 396 Italian consumers suggests that motivations for sustainable consumption may shift depending on specific issues and highlights the limitations of using a binary framework to measure these motivations. This research contributes to understanding the complex drivers behind sustainable behavior emphasizing the roles of egoism and altruism. It was found that these motivations vary across consumers, with altruism emerging as a mix of personal traits and contextual factors. Furthermore, a binary framework for understanding consumer attitudes is insufficient, as a third group was identified, blending both altruistic and egoistic elements. The study also highlighted the importance of awareness campaigns and suggested that combining altruistic and egoistic appeals in advertising can be more effective than focusing on just one motivation.

1. Introduction

Sustainable food consumption can arise from various motivations (Voget-Kleschin, 2015; Hansmann et al., 2020). While some consumers prioritize environmental concerns, others may be driven by a desire for a healthier or more natural lifestyle. This paper explores the diversity of consumer motivations and their connection to adopting sustainable behaviors.

The study has two key objectives: first, to contribute to and expand existing research on the distinction between altruistic and egoistic motivations; and second, to examine the relationship between these motivations and sustainable actions. The findings have important implications for understanding consumer behavior in the context of sustainability. Notably, both altruism and egoism can coexist within the same individual, with their influence varying depending on the specific sustainable action being considered.

This literature review explores the boundaries between altruism and egoism in sustainable consumption, emphasizing their operationalization and interplay. Sustainable consumption behaviours are influenced by a variety of motivations, including environmental concern, health

concerns, and preferences for a natural lifestyle. The study examines the heterogeneity of consumer motivations, the dynamic interplay of altruistic and egoistic tendencies, and their influence on the adoption of sustainable actions. Looking at the theoretical contributions we can find blended models where the integration of altruistic and egoistic motives has been demonstrated to enhance the explanatory power of sustainable behaviours and models where motivation is situated on a spectrum influenced by situational contexts, thus rejecting a strict dichotomy.

Research on the influence of situational contexts and psychological perceptions suggests that self-interested individuals are more likely to engage in pro-environmental behavior when it also provides personal benefits, rather than solely environmental advantages (De Dominicis et al., 2017). In contrast, altruistic individuals participate in pro-environmental actions primarily when they see environmental benefits and may even disapprove of such behaviors if they also yield personal gains.

Lou et al. (2024) further explore the perception of egoistic values in relation to environmental concerns. While egoistic values are often viewed as conflicting with environmental interests, the relationship between these values and pro-environmental attitudes and behaviors

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remains ambiguous. Their study investigates how the perceived psychological distance of environmental issues—such as climate change and local pollution—affects this relationship. The findings suggest that as environmental issues are perceived as more immediate and pressing, the link between egoistic values and pro-environmental attitudes and behaviors strengthens. In contrast, altruistic and biospheric values exhibit different patterns of association.

These results highlight the idea that egoistic values can, under specific conditions, encourage pro-environmental behavior. Understanding these dynamics is crucial for refining environmental theories and shaping more effective sustainability strategies.

Schuitema and De Groot (2015) examined the trade-off between egoistic motives and green product attributes in consumer purchasing decisions. Their findings indicate that when egoistic motives—such as low price and brand familiarity—are satisfied, consumers place greater importance on green attributes like cruelty-free certification and low environmental impact. In environmental psychology, values are categorized into four types (Steg et al., 2014a): biospheric, altruistic, egoistic and hedonic values. Biospheric values, which prioritize environmental protection and strongly shape environmental attitudes. Altruistic values, which focus on the well-being and welfare of others. Research suggests that individuals with strong altruistic values are more likely to engage in pro-environmental behavior (Okabe et al., 2017). Egoistic values, which emphasize personal resources and self-interest. Hedonic values, which prioritize comfort and pleasure. Steg et al. (2014a) highlight the importance of considering hedonic values in environmental studies. They argue that interventions promoting pro-environmental behavior should acknowledge the hedonic consequences of actions, as these can serve as barriers to behavioral change. Additionally, De Groot and Steg (2007) examined the distinction between egoistic, altruistic, and biospheric values across five countries using a novel measurement tool. Their findings confirm the validity of this three-way classification and show that these value orientations are closely linked to behavior-specific beliefs, such as awareness of environmental consequences and personal norms.

Looking at the integrated models of altruistic and egoistic motivations, Song and Kim (2019) explores "impure altruism," where both altruistic and egoistic motivations drive green apparel purchases. Findings from a quasi-experiment show that altruistic appeals promote communal harmony and well-being, while egoistic appeals increase perceived uniqueness and product quality. Both forms of "warmth" contribute to purchase intentions, supporting a blended model of altruism and egoism in sustainable behavior. The study suggests using "feel-good" marketing to enhance green purchasing motivation. The study of Barbarossa and De Pelsmacker (2016) develops a model to understand the drivers and barriers of eco-friendly product purchases, examining both altruistic and ego-centric motivations across "green" and "non-green" consumer groups. Results show that altruistic motives influence green consumers more, while perceived inconvenience discourages non-green consumers more significantly. Additionally, negative motivations impact actual behavior in green consumers more than intentions alone. This research contributes a comprehensive model integrating both positive and negative factors in eco-friendly purchasing and highlights differences in purchasing motivations between consumer groups. Ros and Kaneko (2022) showed in their study a tough feeling of altruism that was found significant in describing pro-environmental and prosocial behavior. Two studies presented by Snelgar (2006) looked at measurement issues and the structure of environmental concerns. The findings have implications for research into environmental concerns and the value-belief-norm theory. The first study compared two scales used to measure beliefs about adverse consequences or concerns, for egoistic, altruistic, and biospheric-valued. Some people did both scales. The environmental concerns scale was more reliable and clearer than the adverse consequences beliefs scale. In the second study, they tested the structure of environmental concerns using a special type of modelling. The three-factor structure fitted the data better than two different

two-factor models. A four-factor structure, including two biospheric concerns, gave the best fit to the data. This structure is discussed in relation to otherness. It was also shown that social and altruistic concerns as human, or anthropocentric, concerns are more closely related to egoistic concerns than to biospheric concerns as general altruistic concerns.

This research conducted by Sun et al. (2022) integrates positive and negative drivers of green purchasing behavior, finding that moral obligations, environmental concern, and social pressure encourage green buying, while price sensitivity and perceived costs hinder it. Social pressure moderates the relationship between price sensitivity and green purchases: the research emphasizes the role of positive ego-centric factors and the impact of social pressure on green consumption.

To explore how completed versus intended (im)moral actions influence food choices, Weibel et al. (2014) found that individuals who engaged in completed egoistic actions were more likely to make healthier food choices compared to those who completed altruistic actions. Research on purchase intentions and consumption choices has examined how consumers balance their own needs with those of others. Birch et al. (2018) investigated the key motivations influencing Australian consumers' attitudes and purchasing behaviors regarding local food. Their study analyzed factors such as ethical self-identity, environmental consciousness, health consciousness, and food safety. The findings revealed that egoistic motivations—particularly concerns about health and safety—had a stronger influence on consumers' attitudes and purchasing frequency than altruistic motivations. A broader analysis of green consumption factors by Mazhar et al. (2022) examined the role of psychological attitudes, subjective norms, perceived behavioral control, and pro-environmental self-identity in shaping green food purchase intentions. Their results showed that biospheric, egoistic, and hedonic values influenced attitudes toward green products, while subjective norms and perceived behavioral control significantly affected purchase intentions. Additionally, research by Simeone and Verneau (2024) found that pro-environmental self-identity and ecologically conscious consumer behavior predicted green purchase intentions, which, in turn, drove green food consumption.

Prakash et al. (2019) investigated the impact of altruistic and egoistic values on consumer attitudes and purchase intentions toward eco-friendly packaging. Their findings suggested that altruistic values had a stronger influence on purchase intentions than egoistic values. Similarly, research on green electronics consumption in Pakistan, focusing on expected eudaimonic well-being, found that self-acceptance and social contribution mediated the effects of green brand awareness and perceived green brand credibility on consumer choices. Furthermore, green altruism strengthened these effects. Mansoor and Paul (2022) suggest that companies should enhance perceptions of self-responsibility and social impact to attract consumers to green brands.

To appeal to mindful consumers, this result recommends that local food producers and retailers adopt targeted marketing, clearer branding and labeling to better communicate product benefits. Grolleau et al. (2009) show that altruistic consumers with an excessively high willingness to pay for eco-labeled products may unintentionally discourage egoistic consumers from purchasing them, resulting in a suboptimal environmental outcome.

Kareklas et al. (2014) in their study uses self-construal theory to explore factors influencing organic food purchases. It finds that both egoistic like health and altruistic as environmental motives predict organic attitudes and intentions, with societal considerations being especially influential. This study explores how altruistic (environmental concern) and egoistic (health concern) values influence consumers' intentions to buy organic food. Data showed both values are influential, with egoistic values having a greater impact (Yadav, 2016). Barbarossa and De Pelsmacker (2016) develop a model to understand the drivers and barriers of eco-friendly product purchases, examining both altruistic and ego-centric motivations across "green" and "non-green" consumer

groups. Results show that altruistic motives influence green consumers more, while perceived inconvenience discourages non-green consumers more significantly. Additionally, negative motivations impact actual behavior in green consumers more than intentions alone. This research contributes a comprehensive model integrating both positive and negative factors in eco-friendly purchasing and highlights differences in purchasing motivations between consumer groups.

Looking at the role of personal identity and social pressure the study of the relationship between motivation, interpersonal altruism, environmental concern and place attachment to recycling behavior has been insufficiently explored in the existing literature. Research conducted by Chao et al., 2023 showed the importance of understanding the factors aimed to address this gap by investigating these relationships, with a particular focus on their influence on the recycling behavior of college students. It is anticipated that a deeper knowledge of these factors could inform strategies to promote the wider adoption of environmental practices. The theoretical model was based on four key factors: motivation, place attachment, environmental concern and interpersonal altruism. Prosocial consumers focused on sustainability tend to use delivery services less. Bautista et al. (2020) develops and validates a model integrating both positive (altruistic and ego-centric) and negative (ego-centric) drivers of green buying. Findings show that moral obligations, green self-identity, and social pressure positively influence green purchase intentions, while price sensitivity and perceived costs have negative effects. Social pressure moderates these relationships, and the research highlights the importance of positive ego-centric factors and provides insights into green consumption motivations in emerging economies.

Previous research conducted by Masson and Otto, 2021 has shown that different values affect pro-environmental behavior more than self-determined motivation. These findings might be because the studies only looked at a few types of pro-environmental behavior. We investigated whether self-determined motivation and value orientations predict broader measures of pro-environmental behavior. Results show that self-determined motivation predicts pro-environmental behavior better than values.

This study conducted by Aruga, K. (2020), sought to ascertain the validity of utilizing a Likert-type environmental awareness index to infer an individual's altruism level. To this end, a comparison was made between models delineating the influence of respondents' demographic variables degree of social and political engagement, and sentiments pertaining to donation on the environmental awareness index and the self-report altruism scale. The study demonstrated a bidirectional relationship between environmental awareness and self-report altruism scale indices using survey data from a sample of Japanese respondents. Additionally, the examination of the influences of respondents' demographic characteristics and other characteristics revealed that the directions of these influences were similar when their estimated coefficients were statistically significant. Consequently, the study validates that the environmental awareness index captures the characteristics of the self-report altruism scale index. Song and Kim (2019) explore "impure altruism," where both altruistic and egoistic motivations drive green apparel purchases. Findings from a quasi-experiment show that altruistic appeals promote communal harmony and well-being, while egoistic appeals increase perceived uniqueness and product quality. Both forms of "warmth" contribute to purchase intentions, supporting a blended model of altruism and egoism in sustainable behavior. The study suggests using "feel-good" marketing to enhance green purchasing motivation. Moreover, the study of Wong et al., 2024) investigates how environmental values affect sustainable consumption. It finds that affective and cognitive consumption mediate the relationship between environmental concerns and sustainable behavior, with no significant difference based on delivery service use frequency.

Analyzing the role of cultural differences and prosocial values, research conducted by Aprile and Fiorillo examines how "other-regarding preferences" like altruism, environmental concerns, and pro-

social behaviors influence organic and local food purchases in Italy. Findings reveal that altruistic and egoistic environmental concerns, volunteering, and ecological association participation positively impact organic and local food purchases. Higher education and income levels strongly correlate with organic purchases, while cultural engagement is linked to both organic and local buying. Pro-social behaviors show a positive association with local but a negative association with organic purchases. Finally, a study tested whether daily messaging interventions with egoistic or ecological appeals could increase pro-environmental behavior (PEB). The results showed no significant effect of the messaging on self-reported pro-environmental behaviour. However, participants reported higher pro-environmental behaviour post-intervention, suggesting that simply being observed may be a more effective strategy. The study highlights the need for alternative approaches to encourage pro-environmental behavior (Kesenheimer and Greitemeyer, 2020). About non-food product sector is interesting the analysis conducted to understand how consumption values affect sustainable behavior on a Nordic second-hand platform. Findings reveal that economic and practical motives reduce green consumption values and sustainable resale behavior, while recreational, societal, and protestor values enhance eco-friendly intentions, especially among women. This highlights the role of non-economic values in promoting sustainable behaviors (Tan et al., 2022).

According to the study of van Riper et al. (2020) knowing how values and motivations affect pro-environmental behavior helps public land management agencies reduce the impact of stakeholder activities on the environment. Research shows that values form a tripartite structure underlying environmental concern including biospheric, egoistic, and altruistic values. However, recent work suggests that hedonic values are also an instrumental basis for environmental problem. Few studies have tested this idea. We believe that hedonic values are important in understanding why people make decisions, especially when they are in contact with nature, when they go to relax. Results show that motivations to escape everyday life can help explain why people engage in minimum-impact activities. A number of studies have utilised frameworks such as biospheric, altruistic, and egoistic values to categorise motivations. In some cases, researchers adopt dichotomous models to measure altruism-egoism, while others explore continuous models to capture nuances.

This research explores this point addressing three main research questions about altruistic and egoistic motivations for sustainable behavior:

- i) is altruism an intrinsic characteristic of the individual or is it a motivation that may emerge depending on the context?
- ii) ii) can the difference between altruism and egoism be modeled as a dichotomy or is a continuous representation more appropriate? And
- iii) iii) if a continuum is identified, can it be represented with a linear measure (i.e., only intensity matters) or a multidimensional measure is more appropriate?

Addressing these research questions, we contribute to the existing debate about motivation for sustainable consumption. In particular, we assess whether estimates of altruism that are obtained observing a specific sustainable behavior (for example, recycling) can be used to investigate other issues (for example, buying seasonal food) or not. Also, we assess the possible loss of information when a binary, dichotomous variable is used to measure altruism and egoism. Both results are of interests of academics and practitioners willing to understand the drivers of sustainable behavior.

We found that consumer may differ in their main motivation for sustainable behavior, but then alternative (secondary) motivations may emerge when specific issues are considered. Thus, although a general propensity to egoism or altruism (or hybrid forms) exists, it appears that the actual motivation may be contingent to the situation considered.

2. Material and methods

We investigate the study questions empirically, using a sample survey of 396 Italian respondents collecting information about motivations for responsible food consumption. This research carried out is an exploratory study with no purpose of inference on the population. The aim is to examine the issues that emerged, confirming consumer behavior described in the theory. Table 1 presents the characteristics of the sample.

The online questionnaire was administered to Italian contacts using social network. during the month of January and February 2023. The questionnaire was constructed using the Google Forms platform and distributed to respondents via digital social media channels, with the primary platforms being Facebook and Instagram. Additionally, the link was disseminated through instant messaging applications, including WhatsApp and Telegram. Respondents were permitted to complete the survey anonymously via a computer, mobile phone, or tablet, with the option of doing so over a variable period of time, ranging from 5 to 8 min. The research conducted was exploratory and was directed to a convenience sample of consumers selected from a reasoned choice. It did not contain open-ended answers, and it was projected with multiple-choice questions.

Data collection was organized into three parts. First, respondents were exposed to an informative introduction about the topic of the survey and the scheme used. This first part is organized by the use of multiple-choice questions and frameworks that aim to identify respondents based on attention and understanding to the sustainability matter in general terms; how they interpret the notion of food quality, whether they accept the contribution of food to ethical and sustainable reasons and to what degree, the food values and the connection with the consumption of sustainable food products is explicitly investigated, the characteristics associated with them and the reasons that encourage and reduce their consumption.

The second section proposed a list of 20 items representing sustainable behavior (see appendix for the complete list) and asked, for each behavior, the main reason for which the detailed practice is or would be applied. Respondents can indicate to their behavior to reasons such as: environmental protection, better and/or healthier nutrition, savings, animal protection, fair trade, attention to the local economy. The options are described in Table 2. The final section collects sociodemographic descriptions of respondents (already reported in Table 1).

The six motivations were coded as egoistic if the benefits of the action are considered only for the respondent or their group (i.e., family or local community). They were coded as altruistic if there is an emphasis on benefits for groups beyond the individual. Also, the motivations were chosen to include the three dimensions of the Triple Bottom Line of

Table 2
Motivations for sustainable consumption.

	Planet (environmental drivers)	People (social drivers)	Profit (personal drivers)
Egoistic		Supporting your local community	Budget saving Healthy diet
Altruistic	Improving animal welfare Reducing environmental impact	Supporting fair trade	

sustainability (environmental, social and financial drivers). Two motivations for each driver of sustainability were chosen. For the environmental driver, the motivations “Reducing environmental impact” and “Improving animal welfare” were chosen. Both motivations are considered as altruistic. The two motivations related to social drivers are “Supporting fair trade” and “Supporting your local community”. Given our general criterion the former motivation is coded as altruistic and the latter one as egoistic. Finally, the financial driver was approximated two motivations focusing on personal benefit: “Budget savings” and “Having a healthy diet”. Both motivations are considered egoistic motivations.

This setting allows us to test the following hypotheses:

- **Altruism as intrinsic characteristic.** If this hypothesis is true, respondents can be divided into two distinct groups: one composed of individual (almost) always following altruistic motivations and the other of individual (almost) always following egoistic motivations. Variation in motivation concerns only difference in drivers within the egoistic or altruistic set. In our study we use intrinsic altruism as the null hypothesis and the alternative hypothesis is contextual altruism, i.e., individuals exhibit egoistic or altruistic motivations depending on the circumstances (in this study, the circumstances are summarized with the type of sustainable action respondents are asked to consider, i.e., the 20 items).
- **Altruism/egoism continuum.** This hypothesis extends contextual altruism by allowing for the role of personal attitude towards altruism. It assumes that the same item may be motivated by altruism or egoism depending on individual’s attitude. In our study we assume that the choice between altruism and egoism depends on the item only as our null hypothesis and we use the altruism/egoism continuum as the alternative hypothesis.
- **Multidimensional nature of the continuum.** We extend the continuous nature of altruism/egoism by allowing for differences in the actual motivation. Our null hypothesis is that moving from egoism toward altruism in the continuum we observe no changes in weighting of between the three drivers of sustainability so that the mix of People and Profit drivers in egoism and the mix of People and Planet drivers in altruism is constant. The alternative hypothesis is that consumers who exhibit intermediate values of egoism/altruism weight the sustainability drivers differently than those at the extremes.

Exhibit 1 summarizes the empirical strategy. In order to test the effect of decision context on the altruistic nature of the motivation, we used a panel data approach and a random effect regression. We organized the dataset in 20 groups (one for each item) with 396 observation (one for each respondent) each. For each observation the following data were considered: a binary variable identifying the choice of altruistic motivation by respondent i for item k ($A_{i,k}$) and vector of demographic variables of each respondent X_i (a proxy for personal preferences). Then, a random effect logistic regression (RELRL) of $A_{i,k}$ on X_i was used. A Likelihood Ratio test was computed to test if there is any statistical difference between the random effect model and a pooled regression. If the null hypothesis of no difference is rejected, we can conclude that the context of the decision affects the emergence of altruistic motivations (hypothesis 1: contextual altruism). The RELRL provide a convenient test

Table 1
Socio-demographic characteristics of the sample.

Variables	Per cent share
Gender	
Female	63.4
Male	35.3
Other	1.3
Age	
18–24	17.4
25–34	32.6
35–44	9.8
45–54	5.5
55–64	26.8
More than 64	7.8
Education	
Primary	2.5
High School	28.3
Degree I	18.4
Degree II	41.7
Post-graduate	9.1

of the effect of items on the probability of having an altruistic motivation. Alternative specifications include fixed effect logistic regression or even using 19 binary variables identifying each item. The three specifications provided similar output and results are robust to changes in specification. We opted for RELR because it grants greater efficiency of estimates and because of the direct estimation of the share of variability that is explained by the items. A test on the coefficients of the vector X_i after controlling for the random effect of the group investigates the role of personal preferences. If the null hypothesis that all coefficients of X_i are equal to zero are rejected, we conclude that the probability of having altruistic motivations varies with personal characteristics. If the data support the relevance of context and personal characteristics, we conclude that each individual has a probability of having altruistic motivation that can be described as a continuous variable (hypothesis 2: altruism/egoism continuum).

The second step of the analysis is to investigate whether using a binary variable identifying egoism and altruism instead of a probability implies an information loss or it can be a sufficient statistic. To this purpose we use an index $I_{j,k}$ computed as the ratio between the relative share of occurrence of motivation k within group j and the relative share of occurrence of motivation k in the sample. If $I_{j,k}$ is greater (smaller) than 100, the motivation k occurred more (less) frequently in the group j than in the total sample. The index is computed as follows:

$$I_{j,k} = \frac{\left(\sum_h^H \sum_{i \in j}^{n_j} M_{i,k,h} \right) / (n_j \cdot H)}{\left(\sum_h^H \sum_{i \in j}^n M_{i,k,h} \right) / (n \cdot H)} \times 100$$

Where $M_{i,k,h}$ is a binary variable equal to 1 if respondent i stated that k was the most important motivation for item h , n_j and n are the number of respondent in group j and in the sample, and H is the number of items. Given the high number of observations, an asymptotic pairwise t -test comparing numerator and denominator can assess if the index is statistically different from 100.

Index $I_{j,k}$ is affected by the number of groups, because the number of respondents in each group changes. We use this property to assess whether a binary variable is a sufficient statistic or not. First, we define the motivation mix as the relative values of the three indexes $I_{j,k}$ for each altruistic group. The mix is based on a relative assessment, meaning that we consider the values of each index compared to the other two. Second, we compare the motivation mix as we increase the number of groups in our classification. If moving from a binary to a non-binary classification the motivation mix is constant (i.e., all indexes decline in the same proportion as we move from altruism to egoism), we conclude that a binary variable is a sufficient statistic. Otherwise, we conclude that there is information value in using a more granular approach, because it represents the motivation mix more accurately. Finally, we compare the results of a classification based on the number of times that respondents state an altruistic motivation with a cluster analysis based on the pattern of motivation and we observe whether the latter one provides more information or not. If it does, we conclude that the continuum is multidimensional, i.e., it is not sufficient to investigate a scalar intensity of altruism/egoism, but it might be useful to acknowledge that different types of altruism/egoism exist (hypothesis 3: multidimensional continuum).

3. Results

In this section, we report the results of the empirical analysis. For clarity, we divided the material into three sub-sections. The first one presents the general results of the investigation such as descriptive statistics, the other two subsections address the intrinsic or contextual nature of altruism and the existence and nature of the continuum.

We investigated if individual consumers rank the three dimensions of sustainability differently depending on the issue they are considering.

To explore this topic, respondents were asked to choose one of the motivations for sustainable behavior in Table 2 as the main motivation for adopting a specific sustainable action. The question was asked for a set of 20 items, i.e., actions involving aspects of sustainability (the list of items is reported in the Appendix). In total we obtained 7920 observations (20 items times 396 respondents).

Being on healthy diet is the most recurring motivation (36 % of answers), following reducing environmental impact (23 %) and supporting local communities (20 %). As expected, egoistic motivations are more frequent than altruistic ones. The per cent frequency of the former ones is 62 % versus 38 % of the latter ones. The three drivers of the Triple Bottom Line have similar frequencies, the environmental driver (Planet) and the social driver (People) was mentioned 29 % of the times each as the most important motivation, and the personal driver (Profit) was selected in 42 % of the cases.

Each respondent provided 20 statements about their prevailing motivations for sustainable actions (one for each item). Each respondent was identified as “altruist” if the number of altruistic motivations exceeded the number of egoistic motivations, and “egoist” otherwise. Overall, 27.8 per cent of respondents were labeled as altruists and 72.2 per cent as egoists. Table 3 reports the share of altruists by gender, age and education and shows that there was no significant difference in gender or education (the ANOVA p-values were 0.269 and 0.272, respectively). A statistically significant difference in age groups was found, with the share of altruists declining with age (ANOVA p-value was 0.001) (see Fig. 1).

3.1. Altruism: intrinsic characteristic or contextual choice

In this section, we test the hypothesis that altruism is an intrinsic characteristic of the individuals versus the hypothesis that altruistic attitude varies with circumstances (contextual altruism). We use the variance in individual motivations across the 20 items to test the hypothesis (Fig. 2). If the intrinsic characteristic hypothesis is true, we expect low variance in individual motivations regardless of the item. If contextual altruism hypothesis is true, we expect that respondents reports a mix of egoistic and altruistic motivations depending on the item.

To test the null hypothesis of intrinsic characteristic versus the alternative hypothesis of contextual altruism we consider each individual respondent and compute the number of items where an altruistic motivation is selected. Under the null hypothesis that altruism is an intrinsic characteristic, we expect a bimodal distribution, with a mode for egoistic individuals who have always egoistic motivations and another mode for altruistic individuals who always have altruistic motivations. A Kolmogorov-Smirnoff test rejected the null hypothesis of

Table 3
Per cent share of altruists by gender, age and education.

	Per cent share of Altruists	Per cent share of Egoists
Total Sample	27.8	72.2
<i>Gender</i>		
Female	27.6	72.4
Male	27.0	73.0
Other	60.00	40.0
<i>Age</i>		
18–24	43.5	56.5
25–34	38.8	61.2
35–44	25.6	74.4
45–54	22.7	77.3
55–64	12.3	87.7
More than 64	6.5	93.5
<i>Education</i>		
Primary	30.0	70.0
High School	33.0	67.0
Bachelor	28.8	71.2
Advanced degree	26.7	73.3

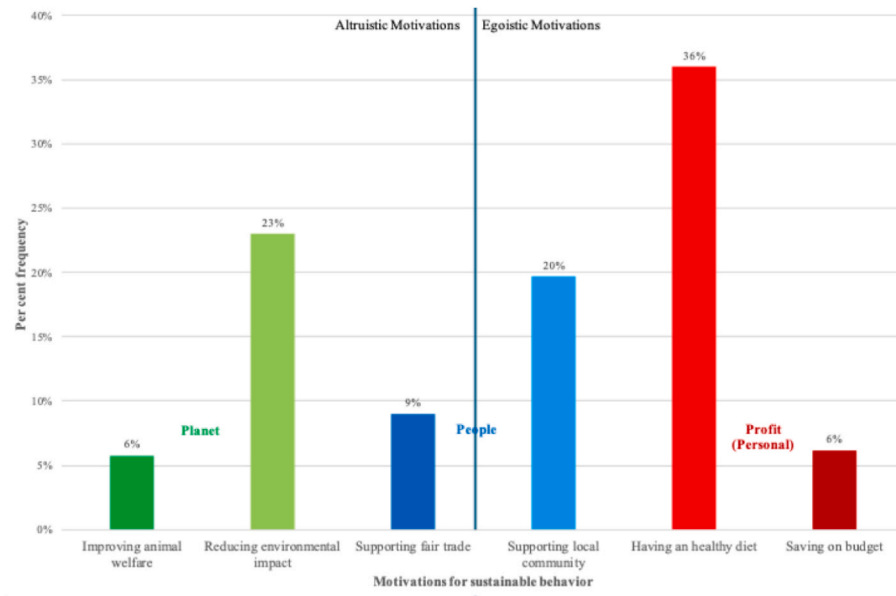


Fig. 1. Per cent frequency of motivations for sustainable behavior.

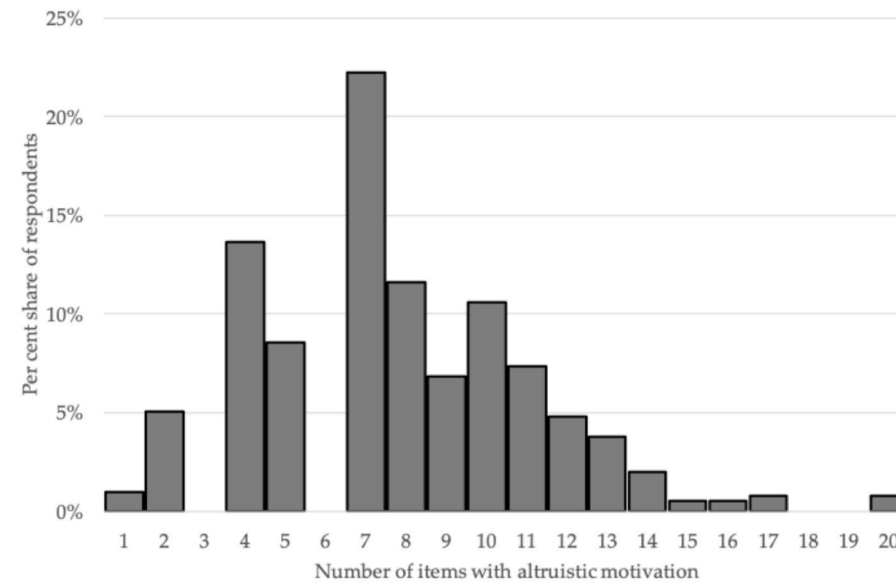


Fig. 2. Per cent distribution of respondents by number of items with altruistic motivation.

bimodal distribution at 99 per cent confidence level. Only 6 per cent of respondents (24 individuals) were consistently egoistic and only 1 per cent were consistently altruistic (3 individuals). The rest exhibited a mix of altruistic and egoistic motivation depending on the items.

In order to investigate this point further, Fig. 3 reports the shares of respondents with egoistic or altruistic motivations for each item. Altruistic motivations prevailed in six items and egoistic motivations prevailed in 14 items.

In 15 out of 20 items, there is a strong minority i.e., at least 25 per cent of respondents who stated an egoistic motivation when the majority stated altruistic motivations or vice versa. Results from Figs. 2 and 3 suggest that altruistic motivations emerge for the joint effect of context and personal preferences. The role of context is found in the variability of individual motivations, as most respondents exhibit a mix of altruistic and egoistic motivations depending on the item. The role of personal preferences emerges from the variability of motivations within each item.

In order to test this conclusion formally, a panel regression approach is used. Data were organized as a balanced panel of 396 observations (the respondents) for each of the 20 units (the items). In this way, it was possible to test panel-level effects, i.e., the part of the variability that is explained by the random effect of the items. Table 4 reports the results of the random-effect logit regression of a binary variable $A_{i,k}$ that is equal to 1 if the i th respondent stated an altruistic motivation for item k .

The regression shows that the probability of having an altruistic motivation depends on three main drivers: age, having children in the household, the item. Age is negatively correlated with altruism. On average, and keeping all other variable constant, elder respondents of age greater than 54 are 14 per cent less likely to have altruistic motivations than respondents of age 18–24. Households with children, on average and keeping all other variables constant, are 3 per cent less likely to have altruistic motivations. The parameter ρ measures the proportion of the total variance contributed by the panel-level variance component. The regression found that 18 per cent of total variance in A_i ,

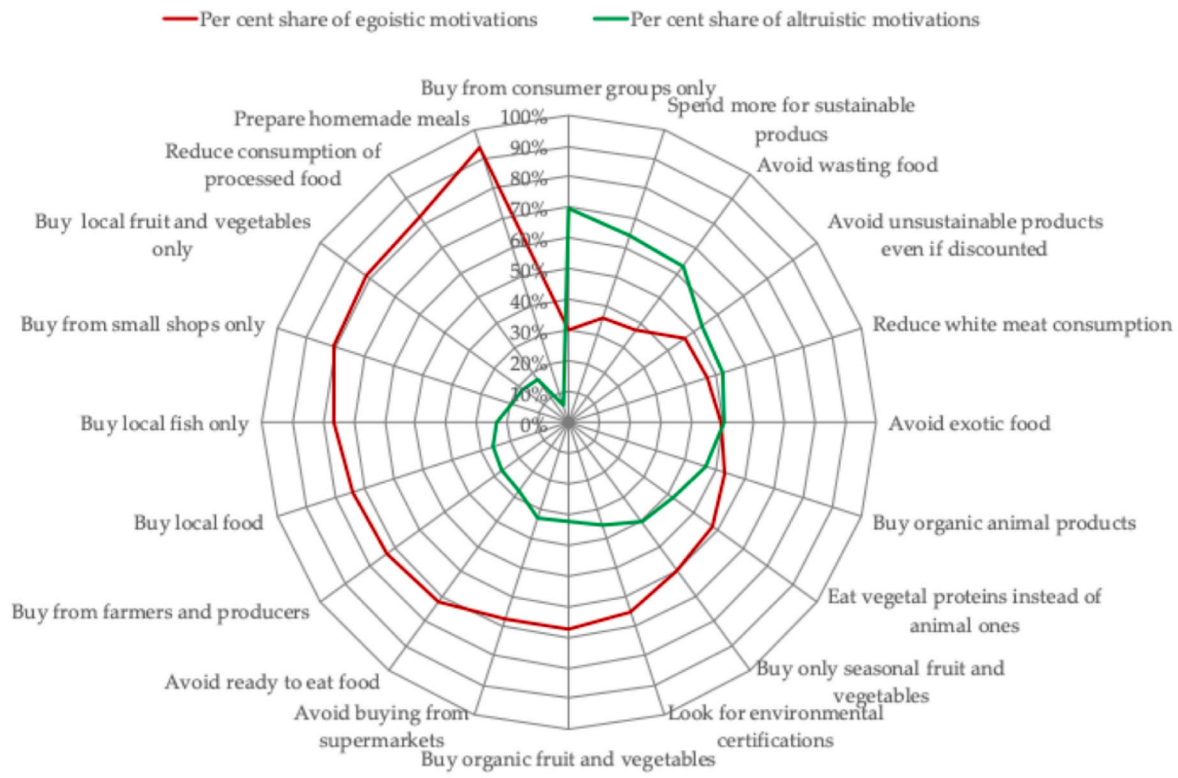


Fig. 3. Share of respondents with egoistic or altruistic motivations by item.

Table 4
Random-effect panel logit regression of altruistic motivations ($A_{i,t}$) on a vector of demographic characteristics of respondents.

N. observations:	7920						
Groups:	20	(items)					
Observations per group:	396	(respondents)					
Wald χ^2 :	211.63		p-value:	<0.001			
Coefficients			Marginal Effects				
	Coef.	Std. Dev.	p-value	Mar. Eff.	Std. Dev.	95 % Conf. Interv.	
<i>Gender (omitted: Male)</i>							
Male		omitted					
Female	-0.050	0.070	0.475	-0.010	0.014	-0.037	0.017
Other	0.175	0.202	0.387	0.036	0.042	-0.047	0.118
<i>Age</i>							
18-24		omitted					
25-34	-0.155	0.056	0.006	-0.033	0.012	-0.057	-0.009
35-44	-0.388	0.099	0.000	-0.081	0.021	-0.122	-0.040
45-54	-0.485	0.164	0.003	-0.101	0.035	-0.169	-0.032
55-64	-0.707	0.132	0.000	-0.144	0.030	-0.202	-0.086
More than 64	-0.721	0.149	0.000	-0.146	0.032	-0.210	-0.083
<i>Education</i>							
Mandatory Education		omitted					
High School	0.161	0.189	0.393	0.032	0.038	-0.042	0.107
College Degree (3 years)	-0.026	0.203	0.900	-0.005	0.040	-0.083	0.073
College Degree (5 years)	0.094	0.198	0.635	0.019	0.039	-0.058	0.096
Post-graduate	0.078	0.199	0.696	0.016	0.040	-0.062	0.093
Household with Children (1 = yes)	-0.164	0.068	0.016	-0.033	0.014	-0.060	-0.006
Constant	0.388	0.224	0.083				
	Estimate	Std. Dev.				95 % Conf. Interv.	
ρ	0.178	0.045				0.106	0.284

k is explained by difference in items. A Likelihood Ratio test returned a χ^2 statistic of 972.62, which allowed us to reject the null hypothesis of no contribution at 99 per cent confidence level. This result is a statistical proof that context affect altruism.

3.2. Altruism as a continuum

Table 4 reports that coefficients and marginal probability of age variables are negative and increasing in absolute value as the respondent's age increases. This supports our hypothesis 2 because

personal characteristics affects the “degree of altruism” defined as the probability of altruistic motivations. Therefore, using a binary variable to identify altruist or egoist respondent can be considered as an approximation of a continuous variable.

In this section, we investigate if this approximation determines an information loss. To this purpose, we run two analyses. Firstly, we compare a binary classification of altruism with a classification based on quartiles to assess if moving from a binary variable to a discrete variable provides more information to the researcher. Secondly, we use a clustering algorithm to identify multidimensional profiles of motivations. Our main goal is to assess if the dichotomy altruism/egoism is a sufficient statistic that summarizes all relevant information about motivation. Table 5 reports the quartile distribution of respondents based on the number of items with altruistic motivations (the uneven frequency is due to respondents with the same number of items with altruistic motivations) with descriptive statistics. The data confirm the negative associations between altruism and age and between altruism and presence of children in the household.

Fig. 4 compares the association index $I_{h,k}$ of the h th group and the k th motivation between a binary classification (panel a) and a classification based on quartiles (panel b). In panel a) the stark distinction between altruists and egoists is clear. The former ones have a positive association with the three altruistic motivations and a negative association with the three egoist motivations. Egoist respondents exhibit associations with healthy diet (positive) and reducing environmental impact (negative).

The quartile distribution reports differences between groups. The two extreme groups (first and fourth quartiles) have expected associations with the consistent motivations. The second quartile has values are close to the sample mean). The third quartile has values that are close to the sample mean except for supporting *animal welfare* and supporting *fair trade*, that exhibit an association that is similar to the fourth quartile.

Using a binary classification instead if a quartile distribution, an important information is lost. While moving along the continuum from extreme altruism toward egoism, the first altruistic motivation that vanishes is the one regarding the environmental impact, while animal

Table 5
Respondents’ distribution by quartile of n. of items with altruistic motivations.

	First quartile	Second quartile	Third quartile	Fourth quartile	Total
N. items with altruistic motiv.	[0, 4]	[5, 7]	[8, 10]	[11, 20]	[0, 20]
N. of respondents	112	88	115	81	396
Gender	per cent share on n. of respondents				
Male	39.3	29.5	34.8	38.3	35.6
Female	59.8	70.5	62.6	60.5	63.1
Other	0.9	0.0	2.6	1.2	1.3
Age	per cent share on n. of respondents				
18–24	6.3	15.9	22.6	27.2	17.4
25–34	21.4	33.0	32.2	48.1	32.6
35–44	8.0	12.5	13.0	4.9	9.8
45–54	8.0	4.5	5.2	3.7	5.6
55–64	42.0	28.4	20.0	13.6	26.8
More than 64	14.3	5.7	7.0	2.5	7.8
Education	per cent share on n. of respondents				
Mandatory Education	2.7	3.4	2.6	1.2	2.5
High School	18.8	22.7	35.7	37.0	28.3
College Degree (3 years)	13.4	21.6	21.7	17.3	18.4
College Degree (5 years)	53.6	38.6	34.8	38.3	41.7
Post-graduate	11.6	13.6	5.2	6.2	9.1
Household with children	per cent share on n. of respondents				
yes	46.4	29.5	24.3	13.6	29.5
no	53.6	70.5	75.7	86.4	70.5

welfare and fair trade are more robust. Respondents in the third quartile are not only “less altruistic” than the ones in the fourth quartile, also they have a different mix of motivations.

To investigate these patterns of motivations, we applied a hierarchical cluster analysis (multiple correspondence) to the dataset using the 20 items as active variables and the six decision drivers as modalities of each variable. The variables are reported in Table 6. The dendrogram method suggested a three-cluster cut (Appendix 1). Because the clusters represent consistent patterns of motivations, we label them as motivation groups. Fig. 5 shows the association indexes for the three clusters that was used for interpretation.

The first cluster includes 28 per cent of the sample. It groups respondents who are associated with environmental drivers: *reducing environmental impact* and supporting *animal welfare*. Those are the main motivation for sustainable behavior and that is higher than the sample average and therefore labeled as *green consumers*.

The second cluster, includes 34 per cent of the sample. It is composed of respondents who place significant emphasis on social drivers that are of particular relevance in this context, namely the support of local communities and the promotion of fair trade. The following motivations have been identified as the driving forces behind the adoption of sustainable behaviours: these consumers are, therefore, considered to be community-oriented.

The third cluster comprises respondents who prioritize personal drivers, such as healthy diets and budgetary savings, along with the mitigation of environmental impact. This group of respondents is termed ‘self-centered consumers’, a designation assuming that the interest in the environment is determined by the increasing awareness of the effect of environmental factors such as climate change and pollution, on their daily lives. This cluster, which is the largest, accounts for 38 per cent of the sample.

Table 7 reports descriptive statistics of the demographic variables by cluster. Using χ^2 tests, statistical associations were detected between cluster participation and gender (p-value 0.008), age (p-value smaller than 0.001), education (p-value smaller than 0.001) and presence of children in the household (p-value 0.028). Green consumers are associated with female and younger consumers. The young age explains the association with high school education (they might be enrolled in the program but not graduated yet) and the absence of children in the household. Self-centered consumers present opposite characteristics, they are associated with elder male consumers with college degree and children. Community oriented consumers present demographic characteristics that are close to the sample mean.

The distribution by cluster and the distribution by quartile (Table 6) are not independent. A χ^2 test rejects the null hypothesis of independence with a p-value lower than 0.001. As expected, the cluster of green consumers is associated with altruism, with shares of respondents in the third and fourth quartiles that are higher than the sample. On the opposite, Community-oriented consumers are associated with the first quartile: the share of respondents in this class is 50.4 per cent of the respondent in the cluster, which is much higher than the total sample. χ^2 tests confirm the association with p-values lower than 0.001. Instead, self-centered consumers have no association with the quartile distribution and a χ^2 test fail to reject the null hypothesis of a distribution that is no different from the overall sample.

The results of the cluster analysis support two conclusions. First, the quartile distribution based on the number of items with altruistic motivations is not a sufficient statistic. It discriminates between Green and Community-oriented respondents, but it does not capture Self-centered respondents.

Second, moving along the continuum from the most egoistic group (Community oriented) to the most altruistic group (Green) motivations for sustainable consumption change. In particular, each group focuses on different dimensions of sustainability. While Green consumers focus on “the planet”, Community-oriented consumers focus on “people” and Self-centered are a mix of environmental concern and personal interest.

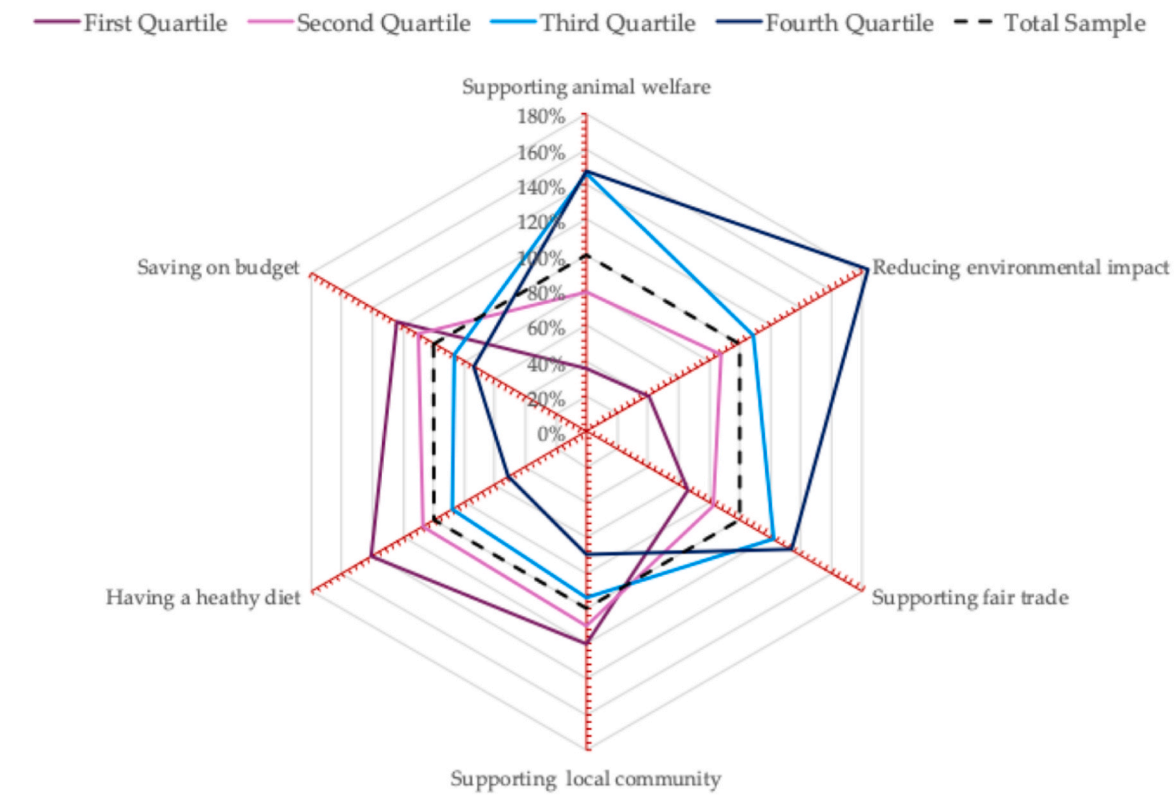
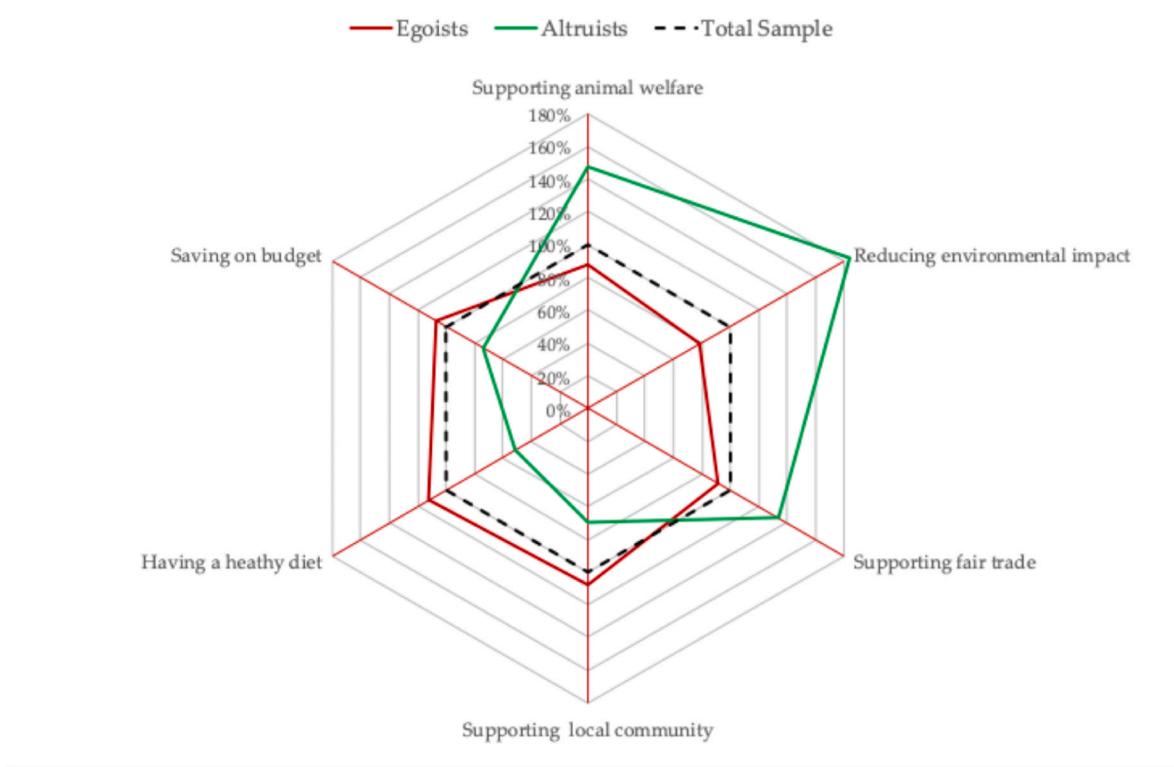


Fig. 4. Association index between Altruism groups and motivations for sustainable behavior. Panel a) reports a binary classification, Panel b) reports a quartile classification.

Table 6
Variables in the cluster analysis.

Items	Motivations					
	Supporting animal welfare	Reducing environmental impact	Supporting fair trade	Supporting local community	Having an healthy diet	Budget savings
Avoid wasting food	6	223	20	9	25	113
Buy local food	4	82	17	203	77	13
Buy from farmers and producers	7	47	52	183	78	29
Spend more for sustainable products	15	163	76	35	106	1
Buy organic fruit and vegetables	8	103	18	31	224	12
Avoid exotic food	0	168	32	111	43	42
Buy organic animal products	115	52	18	29	179	3
Buy from small shops only	3	24	51	244	57	17
Buy from consumer groups only	4	50	222	54	22	44
Avoid buying from supermarkets	4	71	54	185	58	24
Buy local fish onlu	13	70	10	138	157	8
Reduce white meat consumption	125	75	9	9	166	12
Buy only seasonal fruit and vegetables	3	142	14	30	195	12
Buy local fruit and vegetables only	1	57	15	227	79	17
Avoid ready to eat food	3	89	18	23	244	19
Reduce consumption of processed food	4	63	12	6	308	3
Prepare homemade meals	0	23	4	6	274	89
Avoid unsustainable products even if discounted	6	182	36	44	113	15
Look for environmental certifications	13	111	12	44	211	5
Eat vegetal proteins instead of animal ones	92	71	4	8	214	7
Total	426	1866	694	1619	2830	485

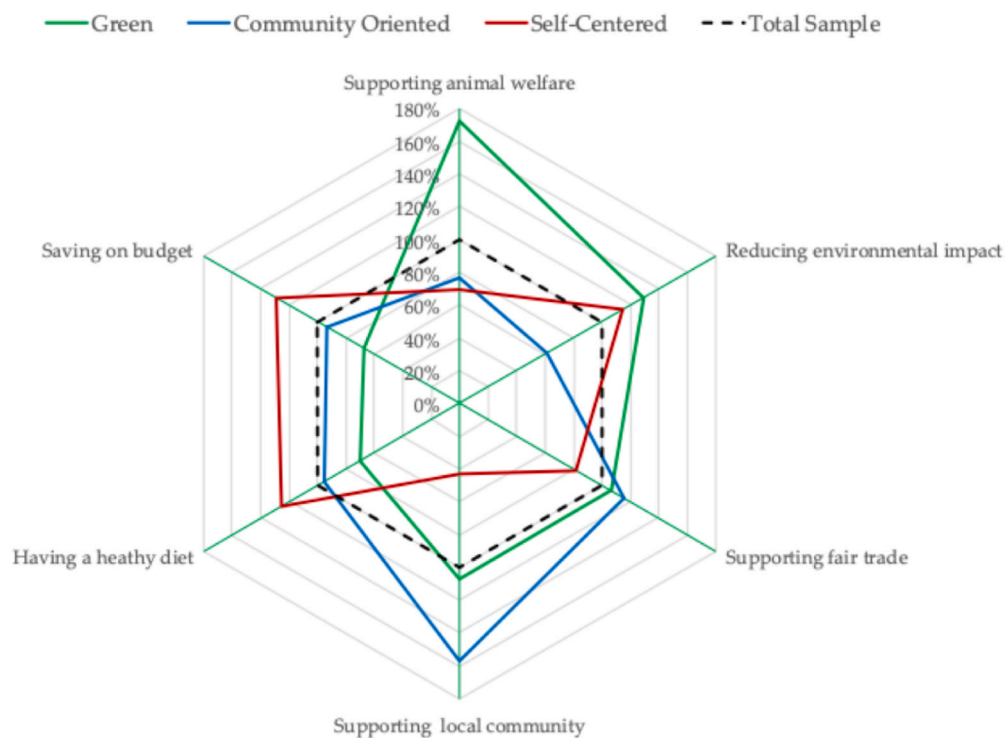


Fig. 5. Association indexes between clusters and motivations.

This result suggest a multidimensional continuum where there are many different way to express combinations of egoism and altruism and motivations cannot be defined by a mere intensity parameter.

4. Discussion and conclusions

Our empirical analysis addressed the issue of motivation in

sustainable actions, focusing on egoism and altruism. Our data confirmed that motivations are heterogeneous across consumers, a well-established result consistent with previous studies and economic theory regarding individual preferences (Feil et al., 2020; Bangsa and Schlegelmilch, 2020).

We contribute to the ongoing academic debate with two major points. First, we found that altruism emerges as a combination of

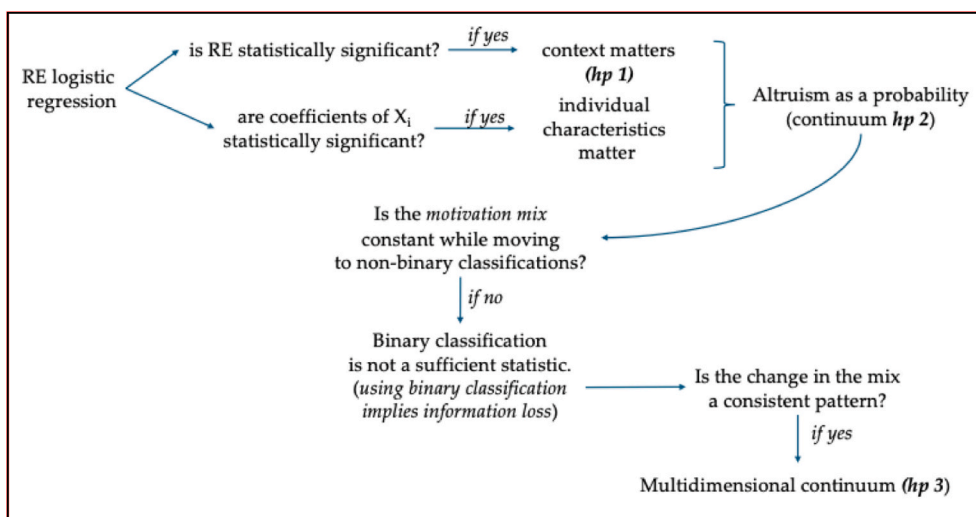


Exhibit 1. Empirical strategy.

Table 7
Respondents' distribution by cluster.

	Clusters			Total Sample
	Green	Community-Oriented	Self-centered	
N. of respondents	108	137	151	396
Gender	per cent share on n. of respondents			
Male	25.0	34.3	44.4	35.6
Female	72.2	65.7	54.3	63.1
Other	2.8	0.0	1.3	1.3
Age	per cent share on n. of respondents			
18–24	26.9	13.9	13.9	17.4
25–34	44.4	29.9	26.5	32.6
35–44	11.1	11.7	7.3	9.8
45–54	3.7	6.6	6.0	5.6
55–64	11.1	28.5	36.4	26.8
More than 64	2.8	9.5	9.9	7.8
Education	per cent share on n. of respondents			
Mandatory Education	0.9	2.2	4.0	2.5
High School	44.4	26.3	18.5	28.3
College Degree (3 years)	20.4	16.8	18.5	18.4
College Degree (5 years)	25.9	43.8	51.0	41.7
Post-graduate	8.3	10.9	7.9	9.1
Household with children	per cent share on n. of respondents			
yes	19.4	33.6	33.1	29.5
no	80.6	66.4	66.9	70.5
Quartile Altruism	per cent share on n. of respondents			
First	0.9	50.4	27.8	28.3
Second	17.6	25.5	22.5	22.2
Third	42.6	20.4	27.2	29.0
Fourth	38.9	3.6	22.5	20.5
Average per cent share of items with altruistic motivations	49.5	28.9	38.4	38.2

personal attitude (intrinsic characteristic) and contextual factors. Given personal preferences, the switch between altruistic and egoistic motivations depends on the specific action considered. This aligns with research suggesting that self-interested individuals are more likely to engage in pro-environmental behavior when personal benefits are involved (De Dominicis et al., 2017). Conversely, altruistic individuals engage in sustainable actions primarily when they see environmental benefits, sometimes disapproving of behaviors that yield personal gains. This has significant implications for analysts and scholars: assessing whether a respondent is generally altruistic or egoistic based on a single

action can be misleading. Firms and practitioners should exercise caution in extrapolating general consumer motivations from egoism or altruism displayed in a specific context.

Second, our findings challenge the strict dichotomy between altruism and egoism in sustainable behavior. Instead of a binary classification, our cluster analysis identified a third group that exhibits characteristics of both. This aligns with blended models in sustainability research, where both motivations coexist and enhance the explanatory power of behavioral models (Song and Kim, 2019). The notion of "impure altruism" suggests that green purchasing decisions integrate both altruistic and egoistic motives, with advertising strategies effectively leveraging both (Kareklas et al., 2014). Future studies may consider applying fuzzy logic to further characterize consumer typologies within this continuum.

Our data highlight the importance of creating awareness in sustainable consumption. Previous studies suggest that social pressure can moderate the relationship between price sensitivity and green purchases, emphasizing the role of positive ego-centric factors (Sun et al., 2022). This underscores the need for targeted nudging strategies that appeal to all three consumer typologies—whether they are environmentalists, community-oriented, or primarily self-interested. Even if their motivations differ, their behaviors can still lead to sustainable outcomes. The case of palm oil illustrates this well: while some consumers boycotted it due to environmental concerns, others only did so after food safety issues arose. Although their motivations diverged, the behavioral outcome was the same. This suggests that marketing strategies and public policies should integrate both altruistic and egoistic appeals to maximize effectiveness.

Looking at demographic profiles, we observe that Green consumers are primarily young and female, associated positively with social drivers and negatively with egoistic drivers. Community-oriented consumers, who are older and more likely to have children, are driven by social factors but less by environmental concerns. Finally, selfish consumers (46 % older respondents) are primarily motivated by egoistic factors and less by social considerations. These findings resonate with prior research indicating that personal identity and social pressure significantly impact recycling behavior (Chao et al., 2023) and that altruistic motivations drive organic and local food consumption (Aprile and Fiorillo, 2020).

Local products and food short chains appeal strongly to both Green and Community consumers. A well-developed local food system enhances sustainability by aligning with their preferences, as suggested by studies on localized consumption and social responsibility in food choices (Birch et al., 2018). Raising awareness through information campaigns is crucial, yet behavioral change is a slow process. From a

libertarian paternalism perspective, strategic interventions should leverage key behavioral drivers to guide all consumers toward sustainable actions. Moreover, studies show that egoistic motivations, such as health concerns, often outweigh altruistic motives in food purchases (Yadav, 2016), highlighting the need to frame sustainability in ways that resonate with personal well-being. Attention to food safety attributes often surpasses concern for environmental impact. However, some food safety improvements (e.g., ingredient changes) may also benefit the environment, leading to similar behavioral outcomes despite differing motivations. This confirms findings by Schuitema and De Groot (2015), who demonstrated that consumers prioritize green product attributes when their egoistic concerns—such as price and brand familiarity—are met. Similarly, Steg et al. (2014a) categorized values into biospheric, altruistic, egoistic, and hedonic, arguing that interventions should consider the hedonic consequences of behavior to enhance engagement.

In conclusion, sustainable consumption behavior is shaped by a dynamic interplay of altruistic and egoistic motivations. Understanding the conditions under which self-interest aligns with sustainability goals can

help refine environmental theories and improve marketing and policy strategies. The integration of blended models and situational context is essential to capturing the complexity of consumer motivations in sustainability.

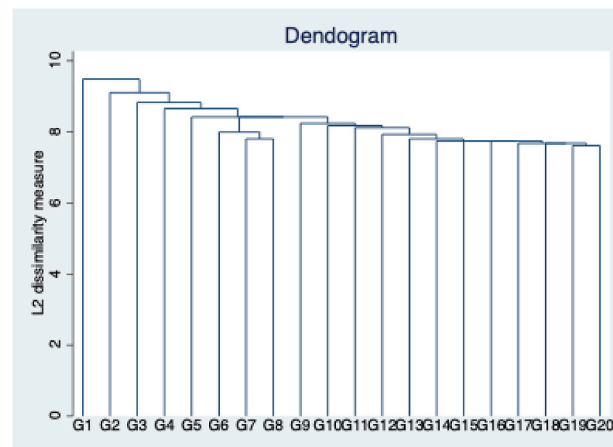
CRediT authorship contribution statement

Mariarosaria Simeone: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Fabio Verneau:** Writing – original draft, Formal analysis, Conceptualization. **Carlo Russo:** Writing – original draft, Validation, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

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

Appendix 1



Appendix 1. Dendrogram.

Data availability

Data will be made available on request.

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