Navigating the green maze: insights for businesses on consumer decision-making and the mediating role of their environmental concerns

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Abstract

Purpose – Green consumption is fundamental to sustainable development, as it involves adopting practices and technologies that reduce the environmental impact of human activities. This study aims to analyze the influence of consumers' green orientation on their environmental concerns and green purchase decisions. Furthermore, the study investigates the mediating role of consumers' environmental concerns in the relationship between pro-sustainable orientation and green purchase decisions.

Design/methodology/approach – This study uses a quantitative methodology, applying the partial least squares method to a sample of 927 Portuguese consumers of green products. The sample was collected through an online survey.

Findings – Perceived benefits and perceived quality of products play a positive and significant role in influencing green behavior, especially when consumers are endowed with greater environmental concerns. In addition, consumers' awareness of the prices of green products and their expectations regarding the future

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benefits of sustainable consumption positively impact green consumption behavior, further intensifying their environmental concerns.

Practical implications – According to the present findings, companies should adopt a holistic and integrated approach to promote green consumption. This means creating premium eco-friendly products, communicating their benefits, addressing the cost factor, emphasizing the future impact of eco-friendly options and raising consumers' environmental awareness.

Social implications – It is critical that environmental education is a priority in schools and that there are political incentives for green behaviors. In addition, media campaigns can be an important tool to raise awareness in society.

Originality/value – The results of this study provide important insights for companies on consumer engagement in the circular economy. Deepening knowledge of the antecedents of consumers' environmental concerns contributes to a deeper understanding of green purchasing decision behavior, allowing companies to support new business strategies.

Keywords Sustainable consumer behavior, Environmental concerns, Green purchase decision, Green consumer orientation, Sustainable development goals

Paper type Research paper

1. Introduction

The growing concern about environmental protection and compliance with the 2030 Agenda significantly influences consumer behavior (Toukabri and Mohamed Youssef, 2023). In this context, sustainable consumption is a practice that aims to reduce the negative environmental and social impacts generated by consumption (Lopes *et al.*, 2023). Green consumers consider environmental issues in their purchasing decisions, looking for products and brands that minimize damage to the environment and society (Nogueira *et al.*, 2023; Gomes *et al.*, 2023). Currently, consumers are also starting to signal their orientation toward sustainability through their green consumption decisions, which, in turn, forces companies to be guided by sustainability principles (Dabija *et al.*, 2020; Legere and Kang, 2020). One of the main examples is retail, namely, the fashion industry (Legere and Kang, 2020; Musova *et al.*, 2021; Papadopoulou *et al.*, 2022) and the food industry (Kumar *et al.*, 2021; Su *et al.*, 2019). Younger consumers in developed regions, especially Generation Z, are the ones who most reflect their environmental concerns in their consumption decisions (Djafarova and Foots, 2022; Liang *et al.*, 2022; Ling *et al.*, 2023; Ribeiro *et al.*, 2023).

Despite evidence that consumers have demonstrated positive attitudes toward green purchasing decisions, often motivated by more significant environmental concerns (Wiederhold and Martinez, 2018; Wang *et al.*, 2021), these attitudes do not always translate, contributing to the green attitude-behavior gap (Chekima *et al.*, 2017). Portuguese Generation Z consumers are no exception, as they try to translate their sustainability orientation into their daily habits and purchasing decisions, despite this behavior often not being assertive (Gomes *et al.*, 2023). This decision by consumers is motivated by their greater environmental awareness, which imposes new daily habits on consumers but also directs their consumption behavior toward other types of products (Saleem *et al.*, 2018). According to these authors, the materialization of the greatest environmental concerns translates into selecting products with sustainable product modes, ecological and environmentally friendly products, high-quality products and products beneficial to health and the environment. In response to green consumption decisions, companies have come to value their sustainable practices as they directly impact the environment and consumer choices (Habib *et al.*, 2021). Several studies have shown that, despite greater environmental awareness and consumers' willingness to adopt more sustainable lifestyles, they are still very reluctant to buy green products (Echegaray and Hansstein, 2017; Al Mamun *et al.*, 2018; Boivin *et al.*, 2016; Johnstone and Tan, 2015), indicating

a disconnect between consumer attitudes toward the environment and their actual adoption of green behavior. Wei *et al.* (2017) emphasize that consumer concern and behavior do not converge, noting that environmental concern does not always translate into green purchasing behavior. Furthermore, Chauhan (2020) reinforces that consumers are willing to support green products but do not translate this into actual purchases. It, therefore, becomes important to explore the factors that drive the decision to buy green by consumers so that companies can guide their offer of products and services toward their desires and needs.

Despite the proliferation of studies in the past few years on the promotion of green purchasing decisions, there is still room for more research (Sharma, 2021; Joshi and Rahman, 2015; Nekmahmud and Fekete-Farkas, 2020; Zhuang *et al.*, 2021; Hazaea *et al.*, 2022). Many studies focus on business strategies and the transformation of sustainability-oriented business models. Thus, more research is needed to understand the factors influencing consumers' green purchasing behavior (Sharma *et al.*, 2023). We believe that only with a deeper understanding of consumers' green purchasing behaviors can companies orient themselves in the age of sustainability. Thus, two important research questions arise:

RQ1. What factors influence consumers' greater environmental awareness?

RQ2. How can greater environmental awareness influence consumers' green purchasing decisions?

The present study aims to explore the influence of determinants of consumers' green orientation on their environmental concerns and their green purchasing decisions. The mediating role of consumers' environmental concerns in the relationship between these determinants and the green purchase decision was also explored. The green consumer orientation determinants considered in this study were the green perceived benefits (GPBs), the green perceived quality (GPQ), the green awareness price (GAP) and the green future estimation (GFE). This paper is also written from the perspective of rational choice theory. According to the rational choice theory, ecological consumers act in a calculated and rational way to achieve their personal goals, taking into account the environmental impact of their decisions (Liebe and Preisendörfer, 2010; Cox, 1999). This theory is based on methodological individualism, which analyzes collective phenomena based on individual decision-making assumptions (Liebe and Preisendörfer, 2010). Rational choice theory makes it possible to predict social outcomes by showing how individuals choose concerning sustainability (Turaga *et al.*, 2010; Liebe and Preisendörfer, 2010). This understanding can help companies adapt their strategies to consumer behavior.

Considering the research questions and studys' objectives, this study uses a quantitative methodology, applying the partial least squares method to a sample of 927 Portuguese consumers of green products. The results reveal that the consumers' green orientation determinants in this study positively influence their environmental concerns, especially the GFE and the GAP. Furthermore, these two factors (GFE and GAP) positively influence the green purchase decision, and GPQ and GPB do not explain the green purchase decision. There is also a positive and very expressive influence of consumers' environmental concerns on the decision to buy green. There is a positive influence between consumers' green orientation determinants and their purchase decisions when mediated by their environmental concerns. These results demonstrate the central role that consumers' environmental concerns play in the green purchase decision, either directly or as the mediator of the relationship between consumers' green orientation determinants and the green purchase decision.

This study contributes to the extension of rational choice theory to green purchasing decision-making. Consumer behavior oriented toward sustainability results from individual preferences that imply opportunity costs that make them choose green products instead of conventional products (Amin and Tarun, 2021; Berger, 2019; Feil *et al.*, 2020). These cost preferences can be shaped by the consumers' green orientation determinants used in this study and can transform how companies operate (Groening *et al.*, 2018). Understanding the motivations for green purchasing decisions can predict companies' sustainable performance. As shown, most studies on the circular economy focus on the role of companies rather than consumers (Sharma *et al.*, 2023) and studies on the consumer side use linear models, and the green purchase decision is not, as proven by previous studies, a simple and direct relationship (Wasaya *et al.*, 2021). This study's research model includes the mediated effects of consumers' environmental concerns between GPBs and green consumer's decisions, GPQ and green consumers' decisions, green awareness price and green consumers' decision, GFE and green consumers' decision, unlike the studies by Mahmoud *et al.* (2022), Nekmahmud and Fekete-Farkas (2020), Gomes *et al.* (2023) and Mishra and Kulshreshtha (2023), which only present research models with the direct effects between different variables. Our study also demonstrates the essential role of environmental concerns as mediators of the relationship between consumers' green orientation determinants and their purchase decisions. In addition, environmental concerns have commonly been used as antecedents of the green purchase decision (Hosta and Zabkar, 2021; Todaro *et al.*, 2019), not exploring the motivations and determinants that awaken consumers to greater green awareness, as happens in our study. This study demonstrates that consumers' environmental concerns may be a consequence of determinants of consumers' green orientation.

2. Literature review

2.1 Rational choice theory

Sustainability-oriented consumer behavior is the result of individual preferences that entail opportunity costs. These opportunity costs lead consumers to choose green products over conventional products. Opportunity cost preferences can be shaped by consumers' green orientation determinants, which can transform how firms operate. Rational choice theory serves as a valuable framework for understanding green purchasing decisions. This theory suggests that individuals make calculated, rational choices to achieve outcomes that align with their personal preferences and objectives (Liebe and Preisendörfer, 2010; Cox, 1999). It is rooted in methodological individualism, which explains collective phenomena based on individual decision-making assumptions (Liebe and Preisendörfer, 2010). When applied to green purchasing, this theory implies that individuals consider the environmental impact of their choices and make decisions grounded in rational thought. Rational choice theory aids in predicting social outcomes by illustrating decision-making processes (Jervis, 1978). That said, the selection of rational choice theory as the basis for this study was for four reasons: First, its versatility in various domains affecting human populations, including economics, business and social interactions, makes it a suitable approach. Second, rational choice theory operates under the assumption that individuals are rational and make choices based on their interests (Dean and Croft, 2009), allowing for a comprehensive understanding of individual purchasing behavior and pro-environmental purchasing behavior (O'Rourke and Ringer, 2016). Third, determining the disconnect between stated preferences and actual purchases is a significant obstacle to achieving sustainability goals, which rational choice theory can be instrumental in helping to identify (O'Rourke and Ringer, 2016). Finally, rational choice theory can be used to analyze why consumers make their decisions and how values,

attitudes and knowledge about sustainability issues influence purchasing behavior (Koenig-Lewis *et al.*, 2014). By comprehending how individuals make choices concerning sustainability, businesses can gain a deeper understanding of consumer behavior and tailor their strategies accordingly.

Green purchasing behavior is a complex and socially responsible form of decision-making (Joshi and Rahman, 2015). Consumers generally have positive attitudes toward eco-friendly products and are willing to buy them (Chen *et al.*, 2021). However, there is often a gap between attitudes and actual behavior, creating a paradox for companies that offer sustainable products (Joshi and Rahman, 2015; Park and Lin, 2020). Using rational choice theory to analyze green purchasing decisions, companies can better understand the factors influencing consumers' preferences and design strategies matching their rational evaluations. Factors such as product knowledge, rating and value assessment affect green purchase intentions (Chen and Deng, 2016; Wang *et al.*, 2022).

One factor that affects the sustainability of businesses is consumers' choice of products or services that have environmental benefits. To understand how consumers make such choices, rational choice theory offers a useful framework that explains the decision-making processes behind green purchasing behavior (Liebe and Preisendörfer, 2010). Several personal factors, such as beliefs, previous sustainable actions and social and cultural influences, can affect the likelihood of engaging in future sustainable actions (Joshi and Rahman, 2015). Businesses that can identify and use these factors can design strategies that motivate and support green purchasing behavior. By matching their products or services with the consumer's preferences and values, businesses can improve their image, earn consumer loyalty and contribute to the sustainability of the business and society (Yang *et al.*, 2019; Gelderman *et al.*, 2021). Therefore, businesses need to consider rational choices concerning green purchasing decision-making to enhance their sustainability and foster a greener future.

2.2 Green perceived benefits

GPBs refer to the positive attributes and advantages consumers associate with environmentally friendly products. These benefits include psychological and practical aspects (Barbu *et al.*, 2022). The concept of GPBs is important for understanding consumer behavior and attitudes toward sustainable consumption. The concept reflects the idea that consumers perceive a sense of improvement in their lives through green products (Barbu *et al.*, 2022; Lin *et al.*, 2017). Therefore, understanding the relationship between GPBs and consumers' environmental concerns is crucial for companies and policymakers promoting sustainable consumption.

The literature indicates that GPBs positively influence consumers' environmental concerns (Gomes *et al.*, 2023; Chen and Chang, 2012). A study by Gomes *et al.* (2023) found that GPBs have a significant impact on consumers' environmental concerns and future green vision. This suggests that when consumers perceive the benefits of green products, they are more likely to develop a strong sense of environmental responsibility and concern. Similarly, Chen and Chang (2012) and Zhuang *et al.* (2021) found that GPBs positively influence consumers' purchase intentions, perceived value and trust in green products. These findings highlight the importance of promoting and communicating the benefits of green products to increase consumers' environmental concerns and encourage sustainable consumption.

In addition to what was previously indicated, GPBs also positively influence the decision-making process of green consumers. Studies have shown that perceived green value and environmental image are positively associated with consumers' attitudes toward green products (Liao *et al.*, 2020). The more consumers perceive the value and benefits of green products, the more likely they are to make environmentally conscious decisions (Tian *et al.*, 2022).

This indicates that consumers' awareness of green products can impact their decision-making process and contribute to a more positive view toward sustainable consumption (Ansu-Mensah, 2021). As consumers accumulate more environmental knowledge, their attention toward purchasing green products increases (Zhuang *et al.*, 2021). Thus, understanding and promoting the GPBs can be crucial in influencing consumers' decisions toward sustainable consumption. Moreover, companies understanding of consumers' GPBs can result in formulating more effective strategies, increasing their performance in the market.

That said, the following hypotheses were formulated:

H1. Green perceived benefits positively influence consumers' environmental concerns.

H1a. Green perceived benefits positively influence green consumers' decisions.

H1b. The perceived green benefits positively influence green consumers' decisions when mediated by consumers' environmental concerns.

2.3 Green perceived quality

GPQ refers to consumers' overall judgment of a products' environmental superiority or excellence (Riva *et al.*, 2022). It is a relevant concept in sustainable consumption as it significantly impacts environmental concerns and consumer decision-making (Gil and Jacob, 2018). Some studies have highlighted GPQ in influencing consumers' attitudes and behaviors toward environmentally friendly products (Zhang *et al.*, 2023; Ansu-Mensah, 2021). For example, Ansu-Mensah (2021) found that GPQ had a significant positive impact on university students' green purchase intentions. This suggests that consumers are more likely to choose products that they consider environmentally superior or excellent.

The relationship between GPQ and consumers' environmental concerns has also been studied (Gil and Jacob, 2018; Chen and Chang, 2013; Gil and Jacob, 2018), which showed that GPQ positively influences consumers' environmental concerns. When consumers perceive a product as environmentally superior or excellent, it triggers positive feelings and increases their trust and purchase intention toward environmentally friendly products (Gil and Jacob, 2018). This indicates that GPQ plays a crucial role in shaping consumers' attitudes toward sustainability and their willingness to engage in environmentally friendly behaviors (Chen and Chang, 2013).

Furthermore, the literature points out that GPQ positively influences consumers' decision-making process (Fraccascia *et al.*, 2023; Chen *et al.*, 2015; Chen *et al.*, 2015), showing that consumers' perception of a product's environmental superiority or excellence affects their satisfaction and trust in the brand. This, in turn, influences their purchase intentions and willingness to pay a premium price for green products (Fraccascia *et al.*, 2023). For example, Fraccascia *et al.* (2023) found that consumers' perceived efficacy positively affects purchase intention and willingness to pay a premium price for green products. These findings highlight the importance of GPQ in shaping consumers' decision-making processes and emphasize the need for companies to prioritize environmental sustainability in their product offerings and marketing strategies.

That said, the following hypotheses were formulated:

H2. Green perceived quality positively influences consumers' environmental concerns.

H2a. Green perceived quality positively influences green consumers' decisions.

H2b. The green perceived quality positively influences green consumers' decisions when mediated by consumers' environmental concerns.

2.4 Green awareness price

The concept of green awareness price refers to the extent to which consumers are willing to pay a premium for environmentally friendly or sustainable products (Ansu-Mensah, 2021; Goriparthi and Tallapally, 2017). The concept further considers consumers' perceptions of the value and benefits associated with purchasing environmentally friendly products and how these perceptions influence their decision-making process (Hong *et al.*, 2019). In other words, it explores the relationship between consumers' willingness to pay more for green products and their environmental concerns (Gomes *et al.*, 2023).

In this context, when consumers perceive that a product is environmentally friendly and are willing to pay a higher price, they show a higher level of concern for the environment (Gomes *et al.*, 2023). This relationship between the price of green consciousness and environmental concerns is crucial to understanding consumers' motivations to engage in sustainable consumption behaviors (Ansu-Mensah, 2021). Higher prices associated with green products can also signal to consumers that the product is of higher quality and more sustainable (Chen *et al.*, 2018).

Conversely, consumers who are more aware of the environmental impact of their purchasing decisions and are willing to pay a premium for green products are more likely to choose environmentally friendly options (Suki, 2013; Goriparthi and Tallapally, 2017). The perceived value associated with the price of green awareness may outweigh the higher cost, as consumers believe their purchase contributes to a positive environmental impact (Ansu-Mensah, 2021). However, it is important to note that the perceived cost of green products can also have an inhibitory effect on green consumption behavior, especially when the price premium is relatively high (Shen and Wang, 2022). Thus, understanding the dynamics between the price of green consciousness, environmental concerns and the consumer decision-making process is critical for companies aiming to meet the growing consumer demand for sustainable products.

That said, the following hypotheses were formulated:

H3. The green awareness price positively influences consumers' environmental concerns.

H3a. The green awareness price positively influences green consumers' decisions.

H3b. The green awareness price positively influences green consumers' decisions when mediated by consumers' environmental concerns.

2.5 Green future estimation

GFE is crucial to shaping consumers' environmental concerns and decision-making processes. GFE refers to how consumers assess and predict the effect of a product or service on the environment and long-term sustainability (Gomes *et al.*, 2023). Future demand for green products is related to consumers' current preference for environmentally friendly products or services (Nekmahmud and Fekete-Farkas, 2020). If consumers value green products, this demand is likely to grow. The valuation of green products depends on factors such as the environmental impact and consumer benefits, such as health and well-being. In addition, previous purchase experience influences consumers' affective, cognitive and emotional reactions (McColl-Kennedy *et al.*, 2015). This experience can occur at different moments of the purchase process (Lemon and Verhoef, 2016; Penz and Hogg, 2011). Gomes *et al.* (2023) found that environmental concerns, GFE and GPQ are interrelated concepts. The study highlights that consumers who engage in GFE tend to have higher environmental concerns as they are more aware of the long-term environmental consequences of their actions. Therefore, this

finding indicates that GFE can act as a catalyst to increase consumers' environmental concerns and promote a more sustainable mindset (Gomes *et al.*, 2023).

Furthermore, the literature points to GFE significantly positively influencing consumers' green purchasing decisions. Some studies have shown that consumers who engage in GFE are more likely to make environmentally conscious choices and opt for sustainable products (Nekmahmud and Fekete-Farkas, 2020; Barbu *et al.*, 2022; Zhang and Dong, 2020). Nekmahmud and Fekete-Farkas (2020) found that estimating the green future of a product has a significant positive impact on green purchasing decisions, particularly among young and educated consumers. This suggests that by considering the long-term environmental implications of their choices, consumers are more inclined to make sustainable purchasing decisions, contributing to a greener future.

That said, the following hypotheses were formulated:

H4. Green future estimation positively influences consumers' environmental concerns.

H4a. Green future estimation positively influences green consumers' decisions.

H4b. The green future estimation positively influences green consumers' decisions when mediated by consumers' environmental concerns.

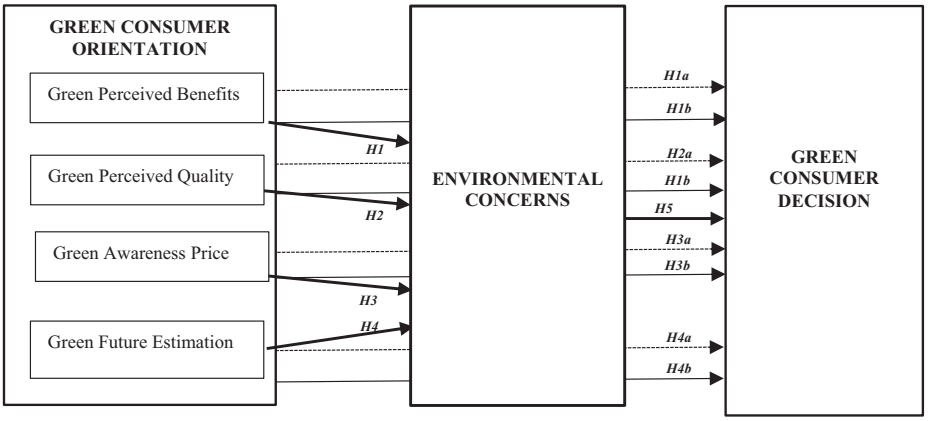
2.6 Consumers' environmental concerns

Consumers' environmental concerns play an important role in shaping their decision-making process, especially regarding green consumerism. Environmental concerns can be defined as the level of awareness and importance that individuals attach to the environmental impact of their consumption choices (Datta, 2011). These concerns cover various aspects, including natural resource depletion, pollution, climate change and the overall sustainability of products and services (Majeed *et al.*, 2022). Chen *et al.* (2022) have shown that consumers' environmental concerns positively impact their green purchasing behavior. In other words, when consumers are more aware and concerned about the environment, they are more likely to make green choices in their purchasing decisions (Chen *et al.*, 2022). In addition, Lin and Syrgabayeva (2016) found that consumers' environmental concern positively influences their willingness to pay more for environmentally friendly products. This suggests that consumers who prioritize environmental concerns are willing to invest in products and services that align with their values and contribute to environmental sustainability (Prakash *et al.*, 2023).

Given the importance of consumers' environmental concerns, marketers and policymakers have a critical role to play in shaping and influencing these concerns (Parker *et al.*, 2023). Marketers can effectively reach and engage environmentally conscious consumers by promoting environmental awareness and highlighting the positive environmental impacts of products and services (Chen *et al.*, 2022). Furthermore, Suki (2013) has shown that consumers' environmental concerns are influenced by factors such as green product awareness, price and brand image (Suki, 2013). Understanding these factors can help companies adapt their marketing strategies to attract environmentally conscious consumers and promote green consumer choices and sustainable consumption patterns (Chen *et al.*, 2022):

H5. Environmental concerns positively influence green consumers' decisions.

Figure 1 shows the research model of this study.



Notes: → direct effects; ⇢ indirect effects
Source: Authors' own creation

Figure 1.
Research model

3. Methodology

3.1 Data collection

The sample for this study was collected through an online questionnaire built on Google Forms, available from October to December 2021. The questionnaire link was published on the authors' social networks (Facebook and LinkedIn) and their contacts. Thus, it was a convenience sample, not a probabilistic one.

The target audience for the questionnaire was Portuguese consumers of green products aged over 18. The purpose of the study was explained to all participants, and the concept of a green product was explained. To ensure that the respondents of the questionnaire corresponded to the defined target audience, the questionnaire contained a first question about the habit of consuming green products: ("Do you have the habit of consuming green products?" – yes or no). If respondents selected the "no" option, their participation would end. The initial sample contained 1,255 responses, of which 927 (73.9%) were considered valid as they fulfilled the conditions defined for the target audience. The questionnaire was anonymous, and voluntary participation and written informed consent were obtained from all participants.

A pre-test was also carried out with 20 participants with different social characteristics regarding gender, age, education and income. The pre-test aimed to assess the participants' understanding of the concepts and questions and their response time. The pre-test results demonstrated that all participants understood the content of the questions, had no doubts when choosing their answers and that the average response time was around 5 min.

3.2 Data measurement

The questions that make up the questionnaire were adapted from the study by Nekmahmud and Fekete-Farkas (2020), which, in turn, was adapted from other authors and a focus group discussion such as Khare (2015), Ha and Janda (2012), Coleman *et al.* (2011), Mostafa (2006), Islam and Zabin (2013), Mishal *et al.* (2017), Sharma and Bansal (2013) and Schlegelmilch *et al.* (1996) (see details in Appendix 1). The questionnaire contained five sections (available in Appendix 1). The first section concerned informed consent and the consumption of green products. The second section referred to the socio-demographic and economic data of the

participants. The third section contained questions about the determinants of consumers' green orientation: GPB with three questions; GPQ with two questions; and GFE with four questions and GAP with three questions. In the fourth section, there were four questions related to environmental concerns, and in the last section, there were four questions related to the green purchase decision. The questions from the previous three groups were measured on a five-point Likert agreement scale, from 1 – Strongly disagree to 5 – Strongly agree.

3.3 Methodological procedures

Given the study's objective and proposed research model, a quantitative methodology was used. Initially, we carried out a statistical analysis in SPSS v.25 software of the participants' characteristics, the constructs contained in the research model and the items that measure them. Then, we performed a factor analysis consisting of an exploratory factor analysis (EFA) to divide the items by factors and a confirmatory factor analysis (CFA) to assess the reflective nature of the proposed model.

Afterwards, we applied the PLS method to the research model using the Smart PLS 3.0 software (Hair *et al.*, 2016). This method allows factorial analysis and the estimation of simple relationships between constructs through the ordinary least squares method (Hair *et al.*, 2019). It does not have as a requirement the normality of the data, a situation that commonly exists when data are collected through questionnaires. In addition, it is a method widely used to study sustainability topics, namely, in studies that use the variables of environmental concerns and sustainable consumer behavior (Antonetti and Maklan, 2014; Saari *et al.*, 2021). The model obtained after applying the PLS method was evaluated in terms of convergence, reliability and discriminant validity using the measures proposed by Hair *et al.* (2019):

- Cronbach's alpha measurements ($C\alpha \geq 0.70$);
- composite reliability ($CR\alpha \geq 0.70$);
- average variance extracted ($AVE \geq 0.50$); and
- discriminant validity tested by the Fornell–Larcker criterion.

This model was also evaluated regarding the coefficient of determination (R^2) and predictive relevance using the Stone–Geisser measure (Q^2). Then, a bootstrapping analysis was performed to estimate the relationships established in the research model.

4. Results

4.1 Descriptive analysis

The sample consists of 927 Portuguese consumers of green products. Statistics on their socio-demographic and economic characterization are shown in Table 1. Most respondents are women (62.7%). The majority of participants are aged between 18 and 26 years old (73%), that is, young people belonging to Generation Z (born from 1997 to 2013). A total of 11.1% of participants are aged between 27 and 42 years old (Generation Y) and 10.6% between 43 and 58 years old (Generation X). Most have completed secondary education (53.8%) and are students (53.4%). Regarding net monthly income, most respondents earn less than €1,000.

The mean and standard deviation of the constructs and the items that measure them are shown in Table 2. Regarding the determinants of consumers' green orientation, the participants generally agreed with the items that measure the constructs, with the GPB generating greater agreement ($M = 4.20$). Respondents agree on average with the items of measure environmental concerns ($M = 4.25$) and to decide to consume green products ($M = 3.99$).

	Frequency (%)
Gender	
Male	37.3
Female	62.7
Age	
18–26 years	73.0
27–42 years	11.1
43–58 years	10.6
>59 years	5.3
Education	
Complete secondary education	53.8
Graduation	36.6
Master's degree	8.6
PhD	1.0
Professional occupation	
Students	53.4
Employees	39.9
Self-employed	4.4
Other	2.3
Monthly net income	
<€1,000	76.6
€1,001–€1,500	14.5
>€1,500	8.9

Source: Authors' own creation

Table 1. Socio-demographic and economic profile statistics of respondents

4.2 Factor analysis

Appendix 2 shows the results of the implementation of EFA and CFA. Concerning the EFA, the 20 initial items were divided into six factors corresponding to each of the constructs in the research model. No items were removed, and the cumulative variance of the three factors is 60.8, with none of the factors individually explaining more than 50% of the variance. All items have commonalities higher than 0.70. The CFA results demonstrate that all items have high confirmatory factor loads (> 0.70), confirming the reflective nature of the model.

4.3 Assessment of the measurement model

Table 3 shows the model evaluation results obtained after applying the PLS method according to the measures proposed by Hair *et al.* (2019). Once the results obtained for the Cronbach's alpha, CR and AVE are superior to the reference values, the model is convergent and reliable. In addition, the results of the Fornell–Larcker criterion (in italics on the diagonal of Table 3) reveal the model has discriminant validity. The quality of the model's fit was also evaluated: Chi-square ($p = 0.091$), goodness-of-fit (0.91), comparative fit index (0.93) and standard root mean square residual (0.097). Fulfilling the reference values, the estimated PLS model presents a good fit.

4.4 Explanatory analysis

The coefficient of determination R^2 of the endogenous variables environmental concerns and green consumer decisions and the predictive relevance (Stone–Geisser Q^2) based on the cross-validated redundancy approach were also evaluated (Table 4). According to Cohen (1988), the environmental concerns and green consumer decisions constructs have a

	Mean	Std. Deviation
Environmental concerns (EC)	*4.25*	*0.816*
EC1	4.51	0.718
EC2	4.32	0.819
EC3	4.12	0.909
EC4	4.03	0.818
Green perceived benefits (GPB)	*4.20*	*0.847*
GPB1	4.46	0.729
GPB2	3.89	1.044
GPB3	4.24	0.768
Green perceived quality (GPQ)	*4.07*	*0.834*
GPQ1	4.23	0.748
GPQ2	3.90	0.919
Green awareness price (GAP)	*4.19*	*0.861*
GAP1	4.55	0.708
GAP2	4.53	0.768
GAP3	3.50	1.108
Green future estimation (GFE)	*4.19*	*0.826*
GFE1	4.44	0.738
GFE2	4.00	0.935
GFE3	4.08	0.871
GFE4	4.27	0.758
Green consumer decision (GCD)	*3.99*	*0.936*
GCD1	4.04	0.924
GCD2	4.42	0.743
GCD3	3.53	1.085
GCD4	3.96	0.991

Source: Authors' own creation

Table 2. Constructs and items statistics

	Cα	CR	AVE	EC	GPB	GPQ	GAP	GFE	GCD
Environmental concerns (EC)	0.797	0.868	0.623	*0.789*					
Green perceived benefits (GPB)	0.709	0.787	0.562	0.581	*0.750*				
Green perceived quality (GPQ)	0.771	0.858	0.752	0.561	0.694	*0.867*			
Green awareness price (GAP)	0.733	0.761	0.516	0.568	0.576	0.545	*0.718*		
Green future estimation (GFE)	0.821	0.882	0.651	0.568	0.573	0.554	0.576	*0.807*	
Green consumer decision (GCD)	0.801	0.871	0.628	0.632	0.544	0.539	0.626	0.654	*0.793*

Note: AVE square root is in italics
Source: Authors' own creation

Table 3. Measurement model evaluation results

"substantial effect" (R^2 of the environmental concerns = 0.472; R^2 of the green consumer decision = 0.574). Also, the obtained model is relevant for predicting the dependent variables environmental concerns and green consumer decision because Q^2 is greater than zero (Q^2 of the environmental concerns = 0.290; Q^2 of the green consumer decision = 0.353).

Table 4 shows the results of estimating the direct relationships in the research model.

	Path (β)	t-values	p-values	Confidence interval 2.5%	97.5%	Support
H1: Green perceived benefits → Environmental concerns	0.206	5.024	0.000	0.129	0.285	Yes
H1a: Green perceived benefits → Green consumer decision	0.029	0.841	0.401	−0.034	0.096	No
H2: Green perceived quality → Environmental concerns	0.168	4.260	0.000	0.096	0.244	Yes
H2a: Green perceived quality → Green consumer decision	0.065	1.908	0.077	−0.004	0.135	No
H3: Green awareness price → Environmental concerns	0.231	6.158	0.000	0.160	0.309	Yes
H3a: Green awareness price → Green consumer decision	0.246	7.502	0.000	0.183	0.312	Yes
H4: Green future estimation → Environmental concerns	0.224	5.683	0.000	0.143	0.299	Yes
H4a: Green future estimation → Green consumer decision	0.311	9.061	0.000	0.235	0.376	Yes
H5: Environmental concerns → Green consumer decision	0.263	8.211	0.000	0.199	0.328	Yes

Source: Authors' own creation

Table 4.
Estimation of direct effects

The results reveal that green orientation determinants positively influence environmental concerns, confirming *H1*, *H2*, *H3* and *H4*. However, the intensity of their influence is not similar. Green awareness price is the green orientation determinant that has the greatest influence on environmental concerns ($\beta = 0.231$), followed by GFE ($\beta = 0.224$), GPBs ($\beta = 0.206$) and, finally, GPQ ($\beta = 0.168$). Furthermore, environmental concerns positively influence green consumer decisions ($\beta = 0.263$), confirming *H5*. Regarding the relationship between green orientation determinants and environmental concerns, GPBs and GPQ were not statistically significant to influence environmental concerns, rejecting *H1a* and *H2a*. However, green awareness price ($\beta = 0.246$) and GFE ($\beta = 0.311$) positively and significantly influence green consumer decisions, confirming *H3a* and *H4a*.

Table 5 shows the results of the mediating effects of environmental concerns on the relationship between the determinants of consumers' green orientation and the green consumer decision.

The results show that green orientation determinants, when mediated by environmental concerns, positively influence green consumer decisions, confirming *H1b*, *H2b*, *H3b* and *H4b*. However, the intensity of this influence is residual ($\beta < 0.10$).

5. Discussion, implications and limitations

5.1 Discussion

The research discussed here highlights the role of environmental concerns in influencing green consumers' decisions to purchase green products. It stresses the importance of green consumers' environmental consciousness when selecting eco-options, which aligns with previous research findings (Saari *et al.*, 2021).

Interestingly, the study found that the GPBs and quality of products alone do not directly impact consumers' green purchasing decisions. This finding suggests that the perceived benefits and quality of green products are not sufficient on their own to drive green

Table 5. Estimation of the mediating effects of environmental concerns

	Path (β)	*t*-values	*p*-values	Confidence interval 2.5%	Confidence interval 97.5%	Support
H1b: Green perceived benefits → Environment concerns → Green consumer decision	0.054	4.169	0.000	0.029	0.079	Yes
H2b: Green perceived quality → Environment concerns → Green consumer decision	0.044	3.973	0.000	0.023	0.067	Yes
H3b: Green awareness price → Environment concerns → Green consumer decision	0.061	4.985	0.000	0.037	0.085	Yes
H4b: Green future estimation → Environment concerns → Green consumer decision	0.059	4.471	0.000	0.036	0.086	Yes

Source: Authors' own creation

consumer behavior, in apparent contradiction with some earlier studies (Ansu-Mensah, 2021; Chen and Chang, 2012; Zhuang *et al.*, 2021), but resonating with Nekmahmud and Fekete-Farkas (2020) concerning the lack of support for the perceived quality latent variable. However, when environmental concerns are considered as a mediator, there is a significant effect of GPBs and GPQ on green consumer decisions. As a result, environmental consciousness amplifies the effect of perceived benefits and quality on green purchasing decisions. Green awareness price and GFE directly have a direct impact on environmental concerns and consumer decisions toward green choices. These constructs mirror consumers' awareness of green product pricing and their projection of the future benefits of green consumption, respectively. These factors have a direct impact on green consumer behavior, according to prior research (Ansu-Mensah, 2021; Nekmahmud and Fekete-Farkas, 2020). The critical point here is that the influence of the price of green consciousness and the estimation of the green future on green consumer behavior is reinforced when these factors simultaneously increase the level of green consumers' environmental concerns. This does not mean these factors are only significant when environmental concerns are heightened. Rather, their influence is more pronounced in that scenario. In other words, consumers' awareness of green product pricing and their anticipation of the future benefits of green consumption not only directly sway their green behavior but also indirectly encourage green consumption by amplifying green consumers' environmental concerns. This complexity adds depth to our understanding of how various factors shape green consumer behavior.

5.2 Theoretical implications

Rational choice theory posits that individuals evaluate various alternatives to optimize their utility. But how does this estimated utility reach a level compelling enough for a consumer to opt for a green product? Our findings suggest that mere tangible or technical benefits may not suffice to trigger the decision. While GPBs and GPQ are necessary, they do not directly result in green consumer decision-making. Instead, they enhance environmental concerns, substantially influencing green consumer decision-making. Environment concerns encompass values, beliefs and knowledge regarding environmental benefits and risks. Our results suggest that the decision process is mainly affected by the degree of environmental concerns experienced by the consumer. From this observation, we extract insights of both

theoretical and methodological significance. A central topic in the literature on green consumption behavior has been the identification of its key determinants. These are usually modeled as exogenous variables or as latent constructs, with minimal interactions amongst them. This approach is recurrent, with examples manifesting in studies such as Nekmahmud and Fekete-Farkas (2020), Gomes *et al.* (2023) and Mahmoud *et al.* (2022).

This study challenges this insulated perspective by going further and suggesting that a complex, integrated, latent process may better explain how a green consumption decision is formed. Consumers' decisions to acquire green products seem to be influenced by a complex mix of rational evaluations, psychological aspects and future-oriented thinking. In our model, the whole is complex by design and overweighs the sum of its individual parts, as green latent factors load positively on environmental concerns, impacting green purchase decisions. As a result, factors may significantly influence green behavior by indirectly contributing to the latent complex process, even if no empirical support for its individual and direct influence is found. This is the main finding implied by our results. This observation may help reconcile theory with apparent contradictory empirical results in the literature, such as those previously mentioned regarding the effect of GPQ. Methodologically, we anticipate such a complex framework could be further enhanced by developing models with higher order constructs, which allow for a higher abstract dimension while simultaneously assessing more concrete subdimensions, in the fashion of Sarstedt *et al.* (2019). An alternative approach could entail devising models that accommodate more extensive interactions between latent constructs, contingent upon managing the resulting increase in degrees of freedom.

5.3 Practical and social implications

The main practical takeaway from this study is that businesses should target and contribute to elevating environmental awareness. The substantial mediating function of environmental concerns in green consumer decisions highlights the relevance of strategies that promote awareness and magnify the value of environment-friendly behaviors. This can involve releasing educational campaigns, partnering with ecological organizations or using marketing methods that underscore the environmental advantages of green products. Our results suggest businesses should embrace a holistic and integrated strategy to promote green consumption. This strategy includes creating premium, beneficial eco-friendly products, properly communicating these benefits, dealing with the cost factor, stressing the future impact of eco-friendly options and also nurturing environmental awareness amongst consumers. Such a comprehensive strategy can add to a firm's sustainable growth and sustain the wider global agenda of environmental sustainability.

A granular view of our study highlights the important role environmental concerns play in green consumer decision-making as a direct influencer and a mediator in the connection between the perceived benefits and quality of green products and consumer decisions. This finding suggests that the responsibility of companies extends beyond merely providing green products, as firms need to support an environmentally aware consumer base proactively. The perceived quality of green products, along with the perceived benefits of these products, was revealed to substantially impact environmental concerns and, indirectly, green consumer decisions. Therefore, businesses should guarantee that their green products satisfy high-quality standards and offer clear and concrete advantages that surpass those of non-green alternatives. These benefits should be successfully communicated to customers, stressing the direct link between using green products and promoting environmental well-being. The pricing of green products likewise plays a considerable function, as our results highlight the value of green awareness prices. Its impact on both environmental

concerns and green consumer decisions reveals that pricing strategies should be sensitive to the perceived cost–benefit analysis of consumers. Businesses should justify the premium pricing by explaining the long-term environmental benefits and the reasons behind the cost, such as ethical sourcing and higher manufacturing standards. In addition, this study points to the value of GFE. Businesses should emphasize the future sustainability effects of using their products, underscoring exactly how selecting their green products adds to broader environmental sustainability. This might entail using future-oriented marketing messages, hence appealing to customers' long-term environmental consciousness.

The practical implications of this study also extend to a considerable social dimension that is worthy of note. The solid impact of environmental concerns on green consumer decision-making highlights the demand for broader social shifts in environmental awareness. Through environmental education in schools, policy incentives for environment-friendly behaviors and media campaigns, society at large can support an environmentally conscious citizenry inclined toward green consumption. Additionally, the finding that perceived benefits and perceived quality of green products substantially affect environmental concerns highlights the value of consumer education. This is not just about the environmental advantages of eco-friendly products but also their personal benefits, such as health and wellness improvements or cost savings in the long term.

Moreover, the role of GFE in influencing both environmental concerns and green consumer decision-making is a call to action for society. To highlight the lasting sustainability impacts of our consumption choices, there is a demand for a social discourse that is future-oriented and, as such, focused on the sustainability of our planet. Lastly, our results on the impact of green awareness prices on environmental concerns and green consumer decisions have implications for social equity. If environment-friendly products are regarded as costly and unattainable by lower income segments of society, this can potentially aggravate social inequalities. Therefore, policy interventions may be needed to make eco-friendly products more affordable, such as subsidies for green products or taxation on non-green alternatives, to ensure that sustainable consumption is within everyone's reach.

5.4 Limitations and future research

While enlightening, this research study presents certain limitations that provide direction for future research. Our sample demographic displayed a skew toward women, younger people and individuals with lower incomes. These characteristics may condition the accessibility of acquiring green products because of numerous factors, such as income restraints and generational mindsets toward environment-friendly consumption. Although some studies point in this direction, there is still no consensus in the literature. As an example, Witek and Kuźniar (2021) found that green purchase behavior is not associated with specific education or age levels. Consequently, future research may explore how results respond to diversified samples regarding gender, age and income levels.

Furthermore, the sample reveals a concentration of responses from participants between age 18 and 22 (60.4%) and students (53.8%). As such, the participants are mostly young people from Generation Z, and the results obtained in this study can reflect the green consumption behaviors of this generation. Based on the existing literature on generational cohorts, it can be acknowledged that consumer actions differ across generations. In this research study, we did not consider sociodemographic variables that could mediate the connection between environmental concerns and green consumer decision-making. It would be interesting to examine this model across various generational cohorts (e.g. Generation X,

Millennials and Generation Z) to contrast green orientations, environmental concerns and green consumer decisions.

On the other hand, our research study focused on consumers who already have a habit of consuming green products. Future studies might likewise explore the actions of consumers who do not presently consume green products to identify their tendency to select environment-friendly consumption options. This would undoubtedly expand our understanding of the elements that could potentially convert non-green consumers into green consumers.

Despite being comprehensive and sustained by literature, the determinants we have adopted in this research study do not exhaust the possible influences on green consumer orientation. Variables such as willingness to pay more for green products, information-gathering behaviors concerning sustainability, consumers' understanding of greenwashing, everyday sustainable practices, as well as various other elements such as collectivism and sustainable citizenship, might be taken into consideration. Including these variables may potentially generate new, perhaps more complex, insights into green consumer behavior.

As a final observation, this study's cross-sectional nature provides us with a snapshot in time, leaving the evolution of these dynamics uncharted. Future research may also consider developing a longitudinal study to comprehend the patterns and adjustments in green consumer behavior over time.

6. Conclusion

This research study provides informed perspectives on the complexities of green consumer behavior. The connections uncovered – between diverse green orientation determinants, consumers' environmental concerns and their eventual green consumer decisions – offer insights into the intricate mechanisms of sustainable consumption. On the one hand, perceived benefits and quality significantly influence consumers' green behavior when they enhance environmental concerns. On the other hand, consumers' awareness of green product pricing and their expectancy of the future benefits of environment-friendly consumption not only directly persuade their green behavior but also indirectly motivate green consumption by intensifying consumers' environmental concerns. The clear spotlight on environmental concerns as a significant mediator enriches our understanding of green consumer actions by showing how environmental awareness links with perceived benefits, perceived quality, price awareness and future estimations to form environment-friendly decisions.

From a practical point of view, these findings light up several courses that businesses and policymakers can take to successfully promote eco-friendly consumer decisions. By highlighting the centrality of environmental concerns in green consumer decision-making, the outcomes of this study underscore the need for strategies to support environmental consciousness amongst consumers. For businesses, specifically those in industries with a considerable ecological footprint, these findings suggest the need to express the ecological advantages of their products more clearly, ensure the quality of green products, justify the pricing and also project the future sustainability ramifications of their usage. This can entail considerable changes in product design, pricing strategies, marketing communication and global business strategy, emphasizing the comprehensive implications of our research study. For policymakers, the substantial mediating function of environmental concerns highlights the relevance of policies and programs to elevate environmental awareness. From school curricula incorporating environmental education to public projects concerning the effect of consumption choices on the environment, there is a clear mandate for policy interventions to improve ecological awareness.

Our research study stresses that promoting green consumer decisions calls for a multi-pronged strategy, emphasizing the essential mediating role of environmental

concerns alongside the direct determinants of such decisions. This insight is very useful for designing far-reaching and effective strategies to encourage sustainable consumption. This way, our research study adds to the academic discussion on green customer behavior and the practical initiatives required to effectively promote sustainable consumption.

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Appendix 1. Questionnaire available at https://shorturl.at/hjwZ3

Appendix 2

	Confirmatory factor load	Varimax-rotated loading factor (*F*) F1	F2	F3	F4	F5	F6	Communality
Environmental concerns								
EC1	0.736	0.720						0.705
EC2	0.832	0.762						0.741
EC3	0.827	0.726						0.759
EC4	0.758	0.728						0.769
Green perceived benefits								
GPB1	0.825		0.708					0.702
GPB2	0.726		0.763					0.800
GPB3	0.854		0.705					0.729
Green perceived quality								
GPQ1				0.705				0.775
GPQ2				0.764				0.721
Green awareness price								
GAP1	0.758				0.763			0.739
GAP2	0.747				0.762			0.759
GAP3	0.745				0.725			0.745
Green future estimation								
GFE1	0.790					0.798		0.731
GFE2	0.789					0.769		0.724
GFE3	0.838					0.708		0.786
GFE4	0.810					0.700		0.731
Green consumer decision								
GCD1	0.847						0.882	0.896
GCD2	0.751						0.824	0.811
GCD3	0.728						0.792	0.723
GCD4	0.837						0.738	0.733

Source: Authors' own creation

Table A1. Results of factor analysis (EFA and CFA)

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