

Article

The Dark Side of Green Marketing: How Greenwashing Affects Circular Consumption?

João M. Lopes ^{1,*} , Sofia Gomes ²  and Tiago Trancoso ³

¹ Miguel Torga Institute of Higher Education & NECE-UBI—Research Unit in Business Sciences, University of Beira Interior, Estrada do Sineiro, s/n, 6200-209 Covilhã, Portugal

² Research on Economics, Management and Information Technologies, REMIT, Portucalense University, 4200-072 Porto, Portugal

³ School of Technology and Management, Viana do Castelo Polytechnic Institute, Av. Atlântico, 4900-348 Viana do Castelo, Portugal

* Correspondence: joao.lopes.1987@gmail.com

Abstract: Nowadays, we are witnessing the growth of the production and consumption of circular products. However, greenwashing is a marketing practice of presenting products as environmentally responsible without actually being so. This practice can influence consumer perceptions and attitudes toward the consumption of circular products. This study aims to explore the influence of companies' greenwashing behaviors on the intention of circular consumption when mediated by environmental concerns and pro-circular information seeking by consumers. To this end, a sample of 826 valid responses from Portuguese consumers was collected. A quantitative methodology was used and the Partial Least Square method was applied. Our study found that greenwashing positively affects consumers' environmental concerns and their propensity to seek sustainable information. These factors, in turn, positively impact their intentions toward circular consumption. The findings challenge the traditionally negative perception of greenwashing, suggesting its paradoxical contribution to promoting sustainability. The study provides valuable insights into consumer behavior related to sustainability and has practical implications for companies and policymakers in shaping effective circular economy strategies.

Keywords: greenwashing; circular consumption; circular economy; sustainable information collecting; environmental concerns



Citation: Lopes, J.M.; Gomes, S.; Trancoso, T. The Dark Side of Green Marketing: How Greenwashing Affects Circular Consumption? *Sustainability* **2023**, *15*, 11649. <https://doi.org/10.3390/su151511649>

Academic Editor: Daizhong Su

Received: 1 July 2023

Revised: 18 July 2023

Accepted: 23 July 2023

Published: 28 July 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

In our modern society, topics such as greenwashing and circular consumption have risen to greater significance. Putting the focus on reducing waste and promoting resource reuse, circular consumption has emerged as a sustainable practice [1,2]. Meanwhile, companies that mislead consumers regarding their environmental practices or product benefits fall into the category of greenwashing. An economy that prioritizes the principles of circularity strives to separate the creation of value from the generation of waste and the use of resources, transforming the ways in which production and consumption are approached [3]. In achieving circular consumption goals, the problem of greenwashing has emerged as a considerable hurdle. To create a false impression of their environmental benefits or impacts, companies employ greenwashing tactics, which has resulted in a lack of consumer confidence and increased confusion [4].

The World Bank [5] released data on the circular economy in the European Union, highlighting that total material use in the EU has decreased by 9.4% over the past two decades, whereas the percentage of resources derived from recycled waste has increased by almost 50%. However, the global economy is still only 9.1% circular, which represents a huge circularity deficit [6]. To combat this, Gatzert et al. [7] indicated that the share of circular consumer goods could increase from the current 10% to around 25–35% by 2030.

The transition to a circular economy is crucial to ensuring the sustainability of the planet and the continuity of economic activities. Consequently, according to Szilagyi et al. [4], individuals who are environmentally conscious are more inclined to purchase circular products. Furthermore, consumers are now more cognizant of the impact of their decisions on the environment and are actively seeking out products that align with their values. In fact, Netto et al. [8] indicated that consumers are happy to pay a higher price for eco-friendly products. However, the challenge of greenwashing arises, making it difficult for consumers to make informed purchasing decisions [1].

In this context, circular consumption practices and the deceptive tactic of greenwashing are intricate subjects that require our attention as conscientious consumers. It is crucial for consumers to be aware to avoid falling into the trap of misleading eco-friendly advertisements used by companies [8,9]. To counteract greenwashing, companies must exhibit transparency and be held accountable for their environmental claims. By supporting sustainable businesses and embracing circular consumption, you can proactively work towards a more sustainable society [10,11]. There are several examples of greenwashing used by companies to encourage the consumption, such as (i) powerful images that companies use related to ecology and nature to convey that they are responsible and environmentally aware; (ii) misleading labels claiming that products have environmental benefits; (iii) certifications that do not exist on how the products are natural and sustainable; (iv) red herrings to try to divert consumers' attention, highlighting aspects of the products as ethical and sustainable; and (v) approximate terminology with self-denomination by companies that their products are green [12].

In the realm of sustainability, circular consumption and greenwashing have gained significant attention. The recent study by the European Commission [13] revealed that 80% of online shops, web pages, and advertisements searched contained green claims such as "green" or "friendly to nature", of which 55.45% were implicit (images, design, and color suggesting environmental benefits), 35% were explicit (logos and labels), and 21% were vague or general environmental claims. In a study carried out within the scope of a mystery shopping action in 2022 in the European Union, 150 environmental claims were evaluated, with 53.2% (more than half) of the ecological or sustainable claims of products and services being considered unfounded, vague, and even misleading regarding the ecological characteristics of the products [13]. Consequently, the proliferation of non-transparent online information about the sustainability of products was identified by 11% of consumers as the biggest obstacle to their participation in the circular economy [13]. These problems are identified as market failures and an insufficiently adapted legal framework.

Circular consumption entails tactics like reusing, recycling, and repairing to minimize waste and optimize resource usage [1]. Greenwashing, in contrast, pertains to the use of false or overblown environmental claims by companies wanting to capitalize on consumers' rising environmental concerns [4]. Green consumption has become a desirable and environmentally harmless political and economic assumption. Yet, concerns are being raised due to the emergence of greenwashing practices, which challenge the credibility of companies' environmental claims [1,14].

Some studies have explored the relationship between greenwashing, circular consumption intention, environmental concerns, and the influence of information on environmental resources. Szilagyi et al. [4] determined through their study that the perceived greenwashing by consumers of an institution is strongly impacted by environmental concerns. Zhang et al. [15] found that the perception of greenwashing has a direct negative effect on the intention to purchase green products, as well as an indirect negative effect via word of mouth about green products. Pagiaslis and Krontalis [16] discovered that concern for the environment has a positive and direct effect on environmental knowledge, beliefs, and behavioral intent. Liobikienė and Poškus' [17] study also documented that environmental concern had a direct impact on the public sphere and an indirect effect on personal behavior via the awareness of behavioral consequences. Kilbourne and Pickett's [18] study found that materialism had a negative impact on environmental beliefs, and these beliefs

had a positive effect on environmental concern and environmentally responsible behavior. Minton and Rose [19] stated that the personal norm had the greatest influence on environmentally friendly consumer behavior, whereas attitude had the greatest influence on consumers' intended behavior. Nguyen, et al. [20] observed that the attitude toward purchasing green products, behavioral control, social influence, and knowledge regarding green products are all significant in influencing consumers' desire to purchase green products. However, environmental concern is not directly related to consumers' desire to be green. Nguyen et al. [20] found that the perception of greenwashing diminishes the effects of environmental concern regarding green behavior. These observations accentuate the necessity of grasping the influences that affect consumers when they choose to engage in circular consumption and the consequences of greenwashing on those decisions. With this in mind, two important research questions are posed: RQ1: How can consumers' perceptions of the adoption of greenwashing behavior by companies influence their environmental concerns, the demand for pro-sustainable information, and their intention of circular consumption? RQ2: How does the perception of consumers about the adoption of greenwashing behaviors by companies influence their purchase intention when consumers already have greater environmental awareness?

There are some unfilled voids in the literature regarding circular consumption and greenwashing despite increased fascination. Further research is essential to assessing the efficacy of circular consumption's impact on waste reduction and sustainability support [3]. Urbański and Haque [21] realized that consumers are generally not able to differentiate between green and sustainable products and that green purchasing behavior is negatively impacted because of greenwashing, and that further study of these phenomena is needed. Zhang et al. [15] mentioned that few studies have examined consumers' perspectives on greenwashing and its associated effects. Furthermore, more exploration is required to understand the effects of greenwashing on companies, different industries, and society as a whole [22–24]. Bridging these literature gaps can help develop guidelines and methods that encourage sustainable consumption and battle greenwashing.

This study enriches the existing literature by linking the concepts of greenwashing, environmental concerns, sustainable information seeking, and circular consumption. This paper makes four main contributions. First, the results advance the theoretical understanding of how consumers adjust their information-seeking behaviors and practices in response to corporate actions such as greenwashing. These results theoretically fit into the norm activation theory, since when consumers detect a problem, as in the case of greenwashing, it activates personal norms, such as environmental concerns, that influence their behavior, namely, in the search for pro-sustainable information. In addition, according to the planned behavior theory, greenwashing can be identified as an external influence with a significant impact that can transform consumer attitudes (environmental concerns) and subjective norms through the collection of pro-sustainable information influencing intentions of circular consumption that are nothing more than the perception of behavioral control. Second, the study sheds light on consumers' responses to greenwashing behavior and its impact on circular consumption intentions. Third, the results further reveal the paradox that consumers adopt more sustainable behaviors when faced with misleading environmental claims. Finally, it is emphasized that consumers respond to perceived greenwashing by seeking more reliable information about sustainability. Thus, for companies/managers, this study demonstrates the importance of effective and sincere customer engagement with sustainable practices promoted by companies. To this end, companies must communicate these sustainable practices transparently, precisely, authentically, and generally understandably and adjust their offer to genuinely sustainable products and services. In addition, the government must impose norms for communicating pro-sustainable information on products and services, forcing companies to transmit the information consumers want to collect.

This study is organized into six sections. Section 1 contains the introduction, and Section 2 include the literature review, the formulation of hypotheses, and the proposed research model. Sections 3 and 4 include, respectively, the methods (sample, variables and

scales, and methodological procedures) and results of the study (statistical description of constructs and items, factor analysis, evaluation of the model obtained after applying the PLS method, and the results of research model estimation). Section 5 is the discussion of the results and theoretical and practical implications, and finally, Section 6 is the conclusion.

2. Literature Review

2.1. Greenwashing in Circular Consumption

The growing phenomenon of “greenwashing” has recently attracted the attention of consumers and academics [14]. Misleading consumers about a company’s environmental practices or products is defined as greenwashing [8]. Furthermore, greenwashing can be viewed as a non-genuine form of corporate social responsibility that can harm both consumers and society [25].

The examination of how greenwashing affects environmental concerns and consumers’ circular consumption intention has been researched [14,26,27]. Studies indicate that perceived greenwashing practices have an adverse effect on consumers, whether it be directly or indirectly [14,28]. Those who perceive that most corporations utilize greenwashing tactics are more eco-conscious and more inclined to participate in circular consumption behaviors [26]. Thus, the perception by consumers that companies are involved in greenwashing practices awakens consumers to greater awareness and environmental concern, impacting their intention of circular consumption. Therefore, the relationship between greenwashing and circular purchase intention is not always direct and may be mediated by consumers’ environmental concerns [15,23]. Junior et al. [29] found that when greenwashing is recognized in a product, its aspects of loyalty, satisfaction, and benefits are lost, and it becomes a product that causes confusion in the consumption of it. Bulut et al. [30] documented that the perception of greenwashing diminishes the effects of environmental concern on green behavior. Zhang et al. [15] affirmed that the perception of greenwashing has a direct negative effect on green purchasing intent, as well as an indirect negative effect via green word of mouth. Not to mention, greenwashing can give rise to distrust in companies and their environmental assertions, leading to negative impacts on the company’s status and sales [27].

In the literature, instances of greenwashing by various industries have been recorded. For example, the fashion industry has faced scrutiny for utilizing ambiguous and deceptive environmental assertions, like “eco-friendly” or “sustainable”, without offering any substantiation [23]. Correspondingly, the food industry has been reproached for utilizing misleading labels, such as “natural” or “organic,” which may not honestly encapsulate the product’s environmental footprint [4]. As a whole, the literature indicates that greenwashing is a prevalent occurrence that can have detrimental effects on both consumers and society [31].

H1. *Consumers who perceive that most companies adopt greenwashing behaviors have higher circular consumption intentions.*

H2. *Consumers who perceive that most companies engage in greenwashing behaviors have more environmental concerns.*

H2a. *Consumers who perceive that most companies adopt greenwashing behaviors have higher circular consumption intentions when mediated by their environmental concerns.*

With consumers becoming more environmentally conscious, companies have been using greenwashing as a means of making exaggerated and false claims about their environmental practices [8]. This unethical practice has become more widespread, but it poses negative consequences for stakeholders, especially consumers [14]. As a result, consumers who believe that most companies are guilty of greenwashing tend to be more interested in learning more about the environment and its resources [32]. To avoid losing the support of eco-friendly consumers, it is essential for companies to provide accurate and transparent information about their environmental practices.

Circular consumption can be affected by greenwashing, as it can lead to distrust between companies and consumers. If claims of being environmentally friendly are not credible, consumers may feel less compelled to engage in reducing waste and reusing resources [27]. Nonetheless, if companies are transparent and truthful in providing information about their environmental practices, it can encourage trust and promote circular consumption among consumers. Netto et al. [8] revealed an upsurge in interest in environmental resources due to the widespread prevalence of greenwashing. Therefore, researchers have been exploring the main ideas and impacts of greenwashing, leading to a greater emphasis on the significance of providing trustworthy and transparent details about environmental resources [8,26]. Furthermore, as consumers increasingly educate themselves about environmental matters, there is expected to be a growing need for truthful and transparent information concerning environmental resources [33]. Thus, consumers who perceive companies' greenwashing practices tend to seek more pro-sustainable information to determine whether these practices are authentic and transparent rather than misleading [34]. According to Testa et al. [35], when consumers perceive that companies adopt greenwashing behaviors, they are more likely to seek information about the sustainable characteristics of products and services, reducing the negative effect these practices may have on their circular consumption. As such, the search for pro-sustainable information is encouraged by companies' greenwashing behaviors and affects their intention of circular consumption [36].

H3. *Consumers who perceive that most companies engage in greenwashing behavior are more likely to seek additional information about environmental resources.*

H3a. *Consumers who perceive that most companies adopt greenwashing behaviors have higher circular consumption intention when mediated by seeking additional information about environmental resources.*

2.2. Environmental Concerns in Circular Consumption

Transforming production and consumption patterns is the goal of the circular economy model, an effort to decrease waste generation and resource utilization [3]. Environmental concerns and the desire for circular consumption are two interdependent concepts that play a crucial role in this endeavor. Circular consumption intention refers to the willingness of consumers to engage in behaviors that support a circular economy, such as buying refurbished products, repairing items, and recycling [37]. Environmental concerns refer to the level of concern that individuals have about the impact of their actions on the environment.

Some studies have demonstrated a positive relationship between environmental concerns and circular consumption intention [4,38]. Consumers with greater environmental concerns are more likely to have a greater intention of circular consumption [4]. Prados et al. [38] found that consumer awareness of environmental problems is key to promoting circular consumption. Similarly, Camacho-Otero et al. [3] found that sustainable consumption, which involves the relationship between consumption and sustainable development, is closely linked to circular consumption.

The literature on consumer behavior and circular economy has also identified several determinants of green purchase intention, including environmental concerns [39,40]. Szilagyi et al. [4] developed a path model for purchasing circular products that takes into account environmental concerns. Bigliardi et al. [39] showed that environmentally conscious behaviors are positively related to green purchase intentions for refurbished smartphones. Therefore, it can be concluded that environmental concerns play a critical role in shaping consumers' intention to engage in circular consumption behaviors.

H4. *Consumers with higher environmental concerns have higher circular consumption intention.*

2.3. Collect Information about Environmental Resources in Circular Consumption

Consumers who wish to participate in the circular economy model must have the ability to make informed decisions regarding their environmental impact. This is achieved by reducing waste generation and resource use through changing production and consumption methods, as explained by Camacho-Otero et al. [3]. Empirical studies have revealed that consumer acquaintance with the environmental consequences of their consumption habits can influence the acceptance of circular consumption [4,37]. Thus, access to environmental resource knowledge is essential to converting consumers into circular consumers.

Gomes et al. [41] revealed that consumers who prioritize environmental impact are more inclined to participate in circular consumption practices. Borrello et al. [42], Duarte et al. [43], Hebrok and Boks [44], and Aschemann-Witzel et al. [45] also emphasized the vital role that consumers play in reducing waste and promoting circular behavior. Therefore, it can be stated that consumers' environmental concerns directly shape their level of engagement with circular consumption practices.

Access to reliable information on environmental resources can encourage and promote sustainable consumer habits. Studies have found that those who actively seek additional environmental information are more inclined to embrace circular consumption [3,4,35,37,41,46]. This research also demonstrates that consumers who prioritize eco-friendly product features are more likely to purchase circular products. With this in mind, making environmental information readily available is a practical approach to promoting circular consumption practices.

H5. *Consumers who seek additional information about environmental resources have higher circular consumption intention.*

Figure 1 contains the research model and the hypotheses formulated in the literature review.

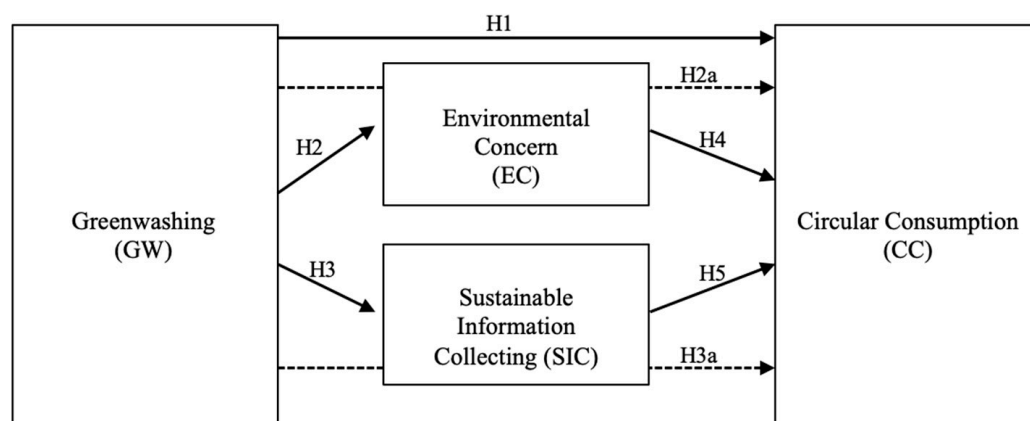


Figure 1. Research model. Note: direct effects (→); indirect effects (---→).

3. Methods

3.1. Sample

This study used a sample collected through an online questionnaire whose link was disclosed on the authors' social networks and to email contacts between September and October 2022. It is, therefore a sample collected for convenience and is not probabilistic. The option of disclosing the questionnaire online was due to the possibility of sending the questionnaire link to more potential participants. Participants were Portuguese citizens over 18 years old. Participants were informed of the objective and purpose of the study, and their informed knowledge was obtained. A pre-test was performed with 15 responses to assess the understanding of the questions by the participants, the structure of the questionnaire, and the response time spent.

In total, 864 responses were collected, of which 826 were considered valid. In 2022, around 9.09 million individuals aged 18 and above were residing in Portugal [47]. Con-

sidering a 3% margin of error, a sample of 1066 responses was needed. As the number of responses was lower, and therefore the sample of this study is not representative of the Portuguese population over 18 years old. The exclusion of the remaining responses was due mostly to incomplete questionnaires and some responses from participants under 18 years of age. In socio-demographic terms, the participants were primarily women (69.9%), with an average age of 33.8 years. A total of 47.7% had a degree, and 39.2% had at most completed secondary education. The rest had master's (11.9%) and doctorate (1.2%) degrees. In terms of professional occupation, 46.4% were employed, 28.9% were students, and 10.2% were self-employed. Regarding net monthly income, 63.9% earned a maximum monthly income of EUR 1000.

3.2. Variables and Scales

The questionnaire consists of five groups of questions (access to the questionnaire is in Supplementary Materials) adapted from Leonidou and Skarmas [34] and Testa et al. [35]. The first group refers to the socio-demographic issues of the participants. Then there are four groups of questions related to the variables considered in this study: (i) Greenwashing (GW), with four questions; (ii) Environmental Concerns (EC), with five questions; (iii) Sustainable Information Collecting (SIC), with three questions; and (iv) Circular Consumption (CC), with six questions. These questions were measured on a 5-point Likert scale where 1—totally disagree and 5—totally agree.

3.3. Methodological Procedures

This study used a quantitative methodology. First, we performed a statistical analysis of the constructs contained in the research model and the items that measure them using the SPSS software (v.25). Then, we performed a factorial analysis by implementing an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA). The purpose of the EFA is to factor the items, and the purpose of the CFA is to confirm the reflective nature of the model and check whether any items have to be excluded due to low confirmatory factor load. As the sample was collected through a questionnaire, we also evaluated whether there was any consistency of response or bias by implementing the common method bias (CMB) using the Harman unifactorial test. The hypotheses established in the research model were tested through the application of the Partial Least Square (PLS) method using Smart PLS (3.0) [48,49]. The PLS method combines a factorial analysis with the estimation of regressions using the Ordinary Least Squares method, not requiring data normality. We applied the kurtosis and skewness statistics and verified that the data used in this study did not have a normal distribution, and as such, the PLS was suitable for the type of data and the purpose of the study. After applying the PLS method to the research model, the obtained model was evaluated in terms of reliability, convergence, and discriminant validity, as suggested by Hair et al. [48]: (i) Cronbach's alpha ($C\alpha > 0.70$), (ii) composite reliability ($CR > 0.70$), (iii) Average Variance Extracted ($AVE > 0.50$), and (iv) discriminant validity, tested by the Fornell–Larcker criterion and HTMT criterion. Finally, a bootstrap analysis was performed in Smart PLS to test the hypotheses contained in the research model.

4. Results

4.1. Statistical Description of Constructs and Items

Table 1 contains the mean and standard deviation of the constructs considered in the research model and the items that measure them. The items that, on average, generated greater agreement among the sample participants were the SIC ($M = 5.34$) and the EC (4.62). It was also revealed that the participants had low circular consumption intention ($M = 2.83$).

Table 1. Mean and standard deviation of constructs and items.

	Mean (M)	Std. Deviation
Environmental Concerns (EC)	4.62 *	0.657 *
EC1	4.67	0.634
EC2	4.86	0.448
EC3	4.32	0.884
EC4	4.62	0.679
EC5	4.65	0.638
Sustainable Information Collecting (SIC)	5.34 *	1.391 *
SIC1	5.43	1.314
SIC2	5.25	1.398
SIC3	5.35	1.460
Circular Consumption (CC)	2.83 *	0.712 *
CC1	2.62	0.661
CC2	2.76	0.611
CC3	2.40	0.771
CC4	3.09	0.765
CC5	3.04	0.711
CC6	3.06	0.753
Greenwashing (GW)	3.88 *	0.930 *
GW1	3.88	0.908
GW2	3.80	0.935
GW3	3.81	0.931
GW4	4.03	0.945

Note: * simple average of the items to which they correspond.

4.2. Factor Analysis

Table 2 shows the results of implementing the EFA and the CFA. The EFA results reveal that the initial 18 items were distributed by four factors, corresponding to each construct defined in the research model (EC, SIC, CC, and GW). The CFA results confirm the reflective nature of the model, and no items were excluded (confirmatory factor load > 0.70). The cumulative variance of the four factors was 62.4%, and no single factor explained more than 50% of the variance (factor 1 relating to EC was the factor with the highest variance, explaining 30.9% of the total variance). As such, the CMB did not affect our data, and there was no inconsistency or bias in the collected responses.

Table 2. EFA and CFA results.

Set of Items	Factor				Communality	Confirmatory Factor Loads
	1	2	3	4		
	EC	SIC	CC	GW		
Environmental Concerns (EC)						
EC1	0.722				0.612	0.759
EC2	0.748				0.588	0.729
EC3	0.702				0.714	0.752
EC4	0.704				0.555	0.751
EC5	0.705				0.57	0.754
Sustainable Information Collecting (SIC)						
PSI1		0.816			0.754	0.893
PSI2		0.817			0.764	0.892
PSI3		0.797			0.735	0.885

Table 2. Cont.

Set of Items	Factor				Communality	Confirmatory Factor Loads
	1	2	3	4		
	EC	SIC	CC	GW		
Circular Consumption (CC)						
CC1			0.634		0.788	0.712
CC2			0.706		0.571	0.775
CC3			0.782		0.512	0.746
CC4			0.771		0.711	0.793
CC5			0.774		0.741	0.731
CC6			0.756		0.753	0.702
Greenwashing (GW)						
GW1				0.854	0.775	0.883
GW2				0.881	0.812	0.895
GW3				0.855	0.783	0.886
GW4				0.803	0.795	0.842

4.3. Reliability, Convergence, and Validity of the Model after Applying the PLS Method

Once the sample data were validated, the PLS method was applied to the research model. The obtained model was evaluated in terms of reliability, convergence, and discriminant validity, as suggested by Hair et al. [48]. The results (Table 3) reveal that the model was reliable and showed convergence ($C\alpha > 0.70$ and $CR > 0.70$; $AVE > 0.50$).

Table 3. Reliability, convergence, and discriminant validity of model.

	Ca	CR	AVE
Environmental Concerns (EC)	0.753	0.837	0.509
Sustainable information Collecting (SIC)	0.869	0.920	0.792
Circular Consumption (CC)	0.807	0.860	0.507
Greenwashing (GW)	0.900	0.930	0.769

Table 4 presents the discriminant validity according to the Fornell–Larcker criterion and the HTMT analysis. The squared AVE values (diagonal in bold) were greater than the intervariable correlation coefficient (EC, SIC, CC, and GW), indicating a high level of discriminant validity. The value obtained for the HTMT scores was less than 0.90 and, as Leguina [50] suggested, there was discriminant validity between the reflexive constructs. Furthermore, the model presented an optimal fit: (i) the Goodness-of-Fit Index (GFI) (0.989; reference value > 0.90), (ii) the Normative Fit Index (NFI) (0.965; reference value > 0.90), and (iii) the Root Mean Square Approximation Error (SRMR) (0.075; reference value < 0.08).

Table 4. Fornell–Larcker criterion.

	Fornell–Larcker Criterion				HTMT			
	EC	SIC	CC	GW	EC	SIC	CC	GW
Environmental Concerns (EC)	0.713							
Sustainable Information Collecting (SIC)	0.427	0.890			0.524		0.599	0.433
Circular Consumption (CC)	0.304	0.400	0.712		0.466			
Greenwashing (GW)	0.344	0.427	0.220	0.877	0.420		0.342	

Note: in bold, the results of the Fornell–Larcker criterion.

Predictive relevance was also evaluated based on the cross-validated redundancy approach of the endogenous variables EC, SIC, and CC using the Stone–Geisser value (Q^2). As Q^2 was greater than zero (Q^2 of the EC = 0.550; Q^2 of the SIC = 0.115; Q^2 of the CC = 0.175), the estimated PLS model was relevant in predicting the dependent variables EC, SIC, and CC.

4.4. Research Model Estimation

Tables 5 and 6 show the results of the bootstrapping analysis. Table 5 shows the estimation of the direct relationships established in the research model. All relationships were statistically significant.

Table 5. Results of direct effects on endogenous variables.

Direct Effects on Endogenous Variables	Path (β)	<i>t</i> -Value (Bootstrap)	<i>p</i> -Value	Confidence Interval		Hypothesis Support
				2.50%	97.50%	
H1: GW \rightarrow CC	0.081	2.275	0.023	0.018	0.156	Yes
H2: GW \rightarrow EC	0.344	8.217	0.000	0.255	0.424	Yes
H3: GW \rightarrow SIC	0.384	9.822	0.000	0.305	0.452	Yes
H4: EC \rightarrow CC	0.162	3.425	0.001	0.071	0.258	Yes
H5: SIC \rightarrow CC	0.331	8.270	0.000	0.243	0.405	Yes

Note: GW—Greenwashing; CC—Circular Consumption; EC—Environmental Concerns; SIC—Sustainable Information Collecting.

Table 6. Results of mediating effects between endogenous variables.

Indirect Effects between Endogenous Variables	Path (β)	<i>t</i> -Value (Bootstrap)	<i>p</i> -Value	Confidence Interval		Hypothesis Support
				2.50%	97.50%	
H2a: GW \rightarrow EC \rightarrow CC	0.056	2.731	0.007	0.023	0.099	Yes
H3a: GW \rightarrow SIC \rightarrow CC	0.127	6.441	0.000	0.087	0.167	Yes

Note: GW—Greenwashing; CC—Circular Consumption; EC—Environmental Concerns; SIC—Sustainable Information Collecting.

The results show that GW positively influenced CC, EC, and SIC ($\beta = 0.081$, $\beta = 0.344$, and $\beta = 0.384$, respectively), confirming hypotheses H1, H2, and H3. However, the fact that companies engage in greenwashing behavior positively influenced consumers' demand for pro-sustainable information. EC and SIC also positively influenced CC intention ($\beta = 0.162$ and $\beta = 0.331$, respectively), confirming hypotheses H4 and H5. A greater demand for pro-sustainable information by participants more positively affected their CC intentions compared to the effect of EC.

Table 6 shows the mediating effects of EC and SIC between GW and CC.

The mediating effects between the constructs contained in the research model demonstrate that the GW positively influenced CC intentions when mediated by EC and SIC ($\beta = 0.056$ and $\beta = 0.127$, respectively), confirming hypotheses H2a and H3a. However, in statistical terms, the relationship between GW and CC when measured by SIC was more significant than when the relationship between GW and CC was directly measured. An inverse situation happened for the relationship between GW and CC when mediated by EC, which was weaker in statistical terms when compared to the direct relationship between GW and CC.

5. Discussion of Results and Implications

5.1. Discussion of Results

Our analysis paints a complex picture of the relationship between greenwashing environmental concerns, sustainable information collecting, and circular consumption intention. Our findings indicate that consumers' perception of prevalent greenwashing behavior among companies is positively associated with their circular consumption intention (H1: $\beta = 0.081$, $p = 0.023$), which may appear counterintuitive considering the conventional wisdom that greenwashing has a negative impact on consumer attitudes and behaviors [27,51,52]. Although our findings suggest that greenwashing paradoxically stimulates environmental concerns and pro-environmental behaviors, some critics may

argue that greenwashing should be exclusively seen as a deceitful business practice that only misleads consumers. The core purpose of greenwashing is to create a falsely positive image about a company's environmental impact, which essentially is a manipulation of consumer perception. Yet, our empirical findings indicate that consumers, in response to such practices, may increase their environmental awareness and adjust their consumption patterns towards more sustainable options.

Interestingly, the indirect effects shed light on the mechanisms underlying these relationships. Indirect effects of greenwashing on circular consumption, mediated by environmental concerns (H2a: $\beta = 0.056$, $p = 0.007$) and sustainable information collection (H3a: $\beta = 0.127$, $p < 0.001$), are stronger than its direct effect (H1), suggesting that greenwashing's influence on circular consumption is primarily exerted through these mediating factors. Consumers might tend to question the sincerity of companies' environmental claims and hence be motivated to seek further information about the product's sustainability, which ultimately influences their intention to engage in circular consumption.

In the case of environmental concerns and circular consumption intention, our findings align with previous studies that have established environmental concern as a significant factor driving sustainable consumption behavior [4,35,38,53]. Our research reinforces the existing consensus, underlining the important role that consumer's concern for the environment plays in shaping sustainable consumption patterns. The greater the degree of their environmental consciousness, the more they exhibit sustainable behaviors such as circular consumption. However, we acknowledge the existence of the value–action or attitude–behavior gap in the realm of environmental sustainability, where consumers' stated attitudes do not always align with their actual behaviors. It can be argued that increased environmental concerns do not guarantee increased sustainable behaviors due to this gap. This highlights the complexity of consumer behavior and the need for further research to examine the factors that bridge or widen the gap between attitudes and actions.

Furthermore, the study introduces sustainable information collection as an intermediary between greenwashing and circular consumption intention. This presents a valuable addition to the discourse on sustainable consumption, as it highlights the importance of information accessibility in sustainable decision-making. Our results lend support to the hypothesis that consumers who are aware of greenwashing tactics are not passively influenced by them but instead respond by actively seeking more reliable information about the products or services. The more they engage in sustainable information collection, the more likely they are to intend to participate in circular consumption behaviors. This reinforces the idea that information seeking is a powerful tool consumers can utilize to make more sustainable decisions [54,55]. Therefore, understanding the mediating role of sustainable information collection provides valuable insights into how consumers process and respond to greenwashing. It indicates that consumer empowerment, through the provision and active seeking of reliable sustainability information, could be a potent mechanism to mitigate the negative effects of greenwashing and promote circular consumption.

5.2. Theoretical Implications

This study makes valuable contributions to the existing literature by establishing connections among the conceptual frameworks of greenwashing, environmental concerns, sustainable information collection, and circular consumption. The results augment our theoretical comprehension of how consumers adjust their behaviors and information-seeking habits in response to corporate actions such as greenwashing. These findings resonate with the norm activation theory, suggesting that when consumers perceive a problem, such as greenwashing, it activates personal norms (like environmental concerns), leading to a change in behaviors, such as the collection of sustainable information.

Simultaneously, the study sheds light on the role of consumers' reactions to greenwashing and their implications for circular consumption intentions. This examination provides a richer understanding of consumer behavior in the context of a circular economy. This relationship can be interpreted through the lens of the Theory of Planned Behavior, which

highlights greenwashing as a significant external influence capable of shaping attitudes—in this case, environmental concerns; molding subjective norms, exhibited as sustainable information collecting; and influencing perceived behavioral control, represented as circular consumption intentions. The study's findings offer a deeper understanding of the paradoxical scenario where consumers confronted with deceptive environmental claims respond by adopting more sustainable behaviors. The findings illustrate that consumers' exposure to greenwashing stimulates their awareness and concern about environmental issues and that environmental concerns mediate the effect of greenwashing on circular consumption intention.

Additionally, the research highlights that consumers respond to perceived greenwashing by seeking more credible information about sustainability. This behavior positively influences their intention to engage in circular consumption, reinforcing the idea that information seeking is a powerful tool consumers can utilize to make more sustainable decisions. In fact, the research reinforces the well-established theory in environmental psychology that environmental concern is a strong driver of sustainable consumption behavior, underscoring the importance of information accessibility and credibility in sustainable decision-making [56].

By bridging existing theories, our study presents a more comprehensive and integrated view of consumer behavior in response to greenwashing. The findings provide robust theoretical insights into how consumers navigate greenwashing and adopt circular consumption behaviors, thereby making contributions to the field of sustainable consumer behavior. This integrated perspective positions the study as a valuable piece of research in understanding consumer behavior within the larger framework of a circular economy.

5.3. Practical Implications

The practical implications drawn from the findings of this study can be meaningfully organized into insights for businesses and policymakers, each underpinned by the relationships we have established through our research hypotheses.

For businesses, the results demonstrate the importance of authentic engagement in sustainable practices. Although greenwashing may inadvertently raise awareness and stimulate interest in sustainable practices, educated consumers tend to react negatively to perceived insincere environmental commitments [57], as seen through the positive effect of greenwashing on circular consumption intention. Therefore, it is important for businesses to commit authentically to sustainable practices and communicate these efforts transparently. Further, businesses need to recognize that consumers who hold strong environmental concerns are more likely to engage in circular consumption. Therefore, companies aiming to cater to this consumer segment should ensure their product and service offerings are genuinely sustainable. These customers are more critical of greenwashing and are likely to seek additional information about the environmental impact of the products or services they are considering. This is a significant implication, given the observed positive relationship between sustainable information collecting and circular consumption intention. Therefore, businesses should ensure that their sustainability information is accurate, easily understandable, and readily accessible.

On the other hand, policymakers should consider the positive relationships we observed between greenwashing, environmental concerns, sustainable information collecting, and circular consumption intention. Our findings underscore the need for stricter regulations to ensure transparency and accuracy in the presentation of sustainability information. Greenwashing perception encourages consumers to seek out more reliable sustainability information, and this information-seeking behavior significantly affects their circular consumption intentions. Therefore, implementing standards for environmental information disclosure could contribute to a more transparent market, foster consumer trust, and facilitate the transition to a circular economy. An alternative viewpoint could suggest that regulatory efforts may fall short due to the complex, international nature of many businesses, rendering such measures ineffective. Although acknowledging this challenge,

our study points to the crucial role that regulation can play in setting boundaries for green claims. Despite potential limitations, regulatory frameworks can still raise the bar for environmental commitments, compelling companies to be more cautious with their green marketing efforts. Further, it is incumbent upon not just domestic but also international regulatory bodies to collaborate and enforce more stringent and universally applicable standards to counter greenwashing.

5.4. Potential Solutions and Best Practices

Battling greenwashing and promoting a sustainable economy is a multifaceted endeavor best approached via a collection of coherent and connected actionable steps. To start with, education is at the heart of this process. Introducing educational campaigns to enlighten the general public on what greenwashing is and also exactly how to recognize it is the very first step. The power of awareness cannot be underestimated, as it can lead to enhanced environmental concerns and a higher tendency for sustainable information seeking, as our findings (H2, H3) show.

Transparency goes hand in hand with education. Firms ought to provide specific, verifiable information concerning their sustainability initiatives. This assists with sustainable information collection, an essential factor in promoting circular consumption (H3, H5), and serves as a deterrent to greenwashing. To strengthen this transparency, third-party verification of environmental claims can be integrated. Independent verification adds a layer of reliability and protects against greenwashing, consequently assisting the process of sustainable information collection, an integral factor in fostering circular consumption (H5).

The fourth action entails stricter regulations and penalties for greenwashing enforced by policymakers. Such measures can efficiently prevent firms from taking part in deceitful practices, which lines up with our study's premise of counteracting greenwashing to encourage circular consumption (H1). With regulatory measures in place, firms should then be encouraged to prioritize genuine sustainability practices over their public image. Our research study suggests that consumers who perceive greenwashing demonstrate higher ecological concerns and look for more sustainable information (H2, H3).

The promotion of the principles of the circular economy is a logical next step. Motivating organizations to optimize resource usage and minimize waste not only promotes authentic sustainability but also lines up with our research's focus on circular consumption (H4, H5). Subsequently, support should be provided to businesses that show a real dedication to sustainable practices. Incentives like tax benefits or subsidies can motivate firms to develop genuine sustainability initiatives over greenwashing. In addition, encouraging regular reporting of sustainability initiatives provides an extensive view of a business's environmental impact. This also relates to our findings on the value of sustainable information availability in promoting circular consumption (H5). Regular reporting not only promotes transparency but also helps to dissuade greenwashing, promoting a culture of genuine sustainability.

Finally, open dialogue between firms and their stakeholders relating to sustainability initiatives is an effective strategy to promote transparency and dissuade greenwashing. It promotes a more powerful connection with consumers and aligns with our study's insights into sustainable information-seeking behaviors.

5.5. Limitations of the Study and Future Lines of Research

Although the results of this study offer meaningful insights, there are several limitations that provide avenues for future research. The most noticeable limitation is the demographic composition of the study sample. The participants consisted predominantly of young, highly educated, female individuals. This may limit the generalizability of the findings, as women are often reported to display stronger pro-environmental attitudes and behaviors than men [58]. Future studies should aim to include a more balanced representation of gender, which would allow for more comprehensive analysis and comparisons between genders.

Further to this, the age and generational profiles of the sample were skewed towards the younger end of the spectrum, with a concentration of Millennials and Generation Z. This leaves room for future studies to investigate the attitudes and behaviors of older generations, such as Generation X and Baby Boomers, towards greenwashing, environmental concerns, sustainable information collection, and circular consumption. Differences between generations could provide more granular understanding of these issues and help to tailor strategies that effectively engage diverse groups.

Another limitation is the cross-sectional design of the study, which provides a snapshot of consumer attitudes and behaviors at a single point in time. Future research could benefit from a longitudinal design to capture changes over time, particularly considering the rapidly evolving nature of sustainability trends and environmental concerns.

Geographically, the study was conducted within Portugal. Although this provides a deep understanding of consumer perceptions within this context, the findings might not be applicable to other cultural or geographic settings. As such, future studies should seek to replicate this research in different geographic and cultural contexts to understand the global dynamics of these relationships.

As a last observation, this study utilized a specific research model that, although robust, did not consider other potentially significant variables like social influence, personal norms, or government policies. Future research could develop a more comprehensive model by including these variables to enrich our understanding of the factors driving circular consumption. By addressing these limitations, future research can continue to advance our understanding of the dynamics of the circular economy and provide more nuanced and actionable insights for policymakers and businesses striving towards sustainability.

6. Conclusions

This research provides significant insights into the complex interplay between greenwashing, environmental concerns, sustainable information collecting, and circular consumption intentions among consumers. Notably, our findings reveal that greenwashing practices significantly influence consumers' environmental concerns and their efforts to collect sustainable information. Perceived greenwashing is significantly associated with higher environmental concerns and a subsequent stronger demand for sustainable information. This influence, in turn, shapes consumers' circular consumption intentions, which involve the use and reuse of resources in a closed loop, reducing waste, and minimizing environmental impact.

The implications of our study for businesses and policymaking bodies are profound and multi-dimensional. Companies need to recognize the potential double-edged sword of greenwashing—it might stimulate short-term pro-environmental behaviors but could eventually foster consumer skepticism and erode trust. Conversely, businesses committed to genuine environmental stewardship could capitalize on this consumer response by offering greater transparency, substantiating their green claims, and providing accessible and trustworthy information on their environmental impacts.

For policymakers, our results underline the critical importance of stringent regulation to curb greenwashing and promote transparent communication about sustainability. It is thoughtful to realize that equipping consumers with reliable and accurate information about the environmental impacts of products and services is not only a responsibility but also a potent mechanism to foster sustainable consumption behaviors.

The phenomenon of greenwashing in the age of sustainability is like a moving target, complex and continually evolving. Future research can further build on our findings by studying the impact of greenwashing across different demographic groups, cultural contexts, and industries. Moreover, our study presents actionable steps to combat greenwashing—steps that could inspire real, on-the-ground changes. However, how effective would these steps be when implemented in the real world? This is another direction for future research to explore, which could deepen our understanding and provide more practical insights for all stakeholders involved in the battle against greenwashing.

Supplementary Materials: Questionnaire available at <https://shorturl.at/rABNV>, accessed in 1 June 2023.

Author Contributions: Conceptualization, J.M.L. and T.T.; methodology, S.G.; software, S.G.; validation, J.M.L. and T.T.; formal analysis, S.G. and T.T.; resources, J.M.L.; data curation, S.G.; writing—original draft preparation, J.M.L., T.T. and S.G.; writing—review and editing, J.M.L., T.T. and S.G.; visualization, J.M.L.; supervision, J.M.L. and T.T.; project administration, J.M.L., T.T. and S.G. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval were waived for this study due to Portuguese law and guidelines from the Foundation for Science and Technology.

Informed Consent Statement: According to the data source, informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Acknowledgments: NECE-UBI, Research Center for Business Sciences, Research Center and this work are funded by FCT – Fundação para a Ciência e a Tecnologia, IP, project UIDB/04630/2020.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Kopnina, H. Green-washing or best case practices? Using circular economy and Cradle to Cradle case studies in business education. *J. Clean. Prod.* **2019**, *219*, 613–621. [CrossRef]
2. Gomes, S.; Lopes, J.M.; Nogueira, S. Willingness to pay more for green products: A critical challenge for Gen Z. *J. Clean. Prod.* **2023**, *390*, 136092. [CrossRef]
3. Camacho-Otero, J.; Boks, C.; Pettersen, I.N. Consumption in the Circular Economy: A Literature Review. *Sustainability* **2018**, *10*, 2758. [CrossRef]
4. Szilagyi, A.; Cioca, L.-I.; Bacali, L.; Lakatos, E.-S.; Birgovan, A.-L. Consumers in the Circular Economy: A Path Analysis of the Underlying Factors of Purchasing Behaviour. *Int. J. Environ. Res. Public Health* **2022**, *19*, 11333. [CrossRef] [PubMed]
5. World Bank. World Bank Releases Its First Report on the Circular Economy in the EU, Says Decoupling Growth From Resource Use in Europe Achievable Within Decade. Available online: <https://www.worldbank.org/en/news/press-release/2022/12/06/world-bank-releases-its-first-report-on-the-circular-economy-says-decoupling-growth-from-resource-use-in-europe-achievable> (accessed on 20 June 2023).
6. TRVST. Circular Economy Facts & Statistics. Available online: <https://www.trvst.world/environment/circular-economy-facts-statistics/> (accessed on 20 June 2023).
7. Gatzert, S.; Helmcke, S.; Roos, D. Playing Offense on Circularity Can Net European Consumer Goods Companies €500 Billion. Available online: <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/playing-offense-on-circularity-can-net-european-consumer-goods-companies-500-billion-euros> (accessed on 20 June 2023).
8. Netto, S.V.F.; Sobral, M.F.F.; Ribeiro, A.R.B.; Soares, G.R.d.L. Concepts and forms of greenwashing: A systematic review. *Environ. Sci. Eur.* **2020**, *32*, 19. [CrossRef]
9. Schmuck, D.; Matthes, J.; Naderer, B. Misleading Consumers with Green Advertising? An Affect–Reason–Involvement Account of Greenwashing Effects in Environmental Advertising. *J. Advert.* **2018**, *47*, 127–145. [CrossRef]
10. Barros, M.V.; Salvador, R.; Prado, G.F.; Francisco, A.C.; Piekarski, C.M. Circular economy as a driver to sustainable businesses. *Clean. Environ. Syst.* **2021**, *2*, 100006. [CrossRef]
11. Sassanelli, C.; Terzi, S. Circular Economy and Sustainable Business Performance Management. *Sustainability* **2023**, *15*, 8619. [CrossRef]
12. Safdie, S. Greenwashing: All You Need to Know in 2023. 2023. Available online: <https://greenly.earth/en-us/blog/company-guide/what-is-greenwashing-all-you-need-to-know-in-2022> (accessed on 22 July 2023).
13. European Commission. *Impact Assessment Report*; European Commission: Brussels, Belgium, 2022; p. 261.
14. Santos, C.; Coelho, A.; Marques, A. A systematic literature review on greenwashing and its relationship to stakeholders: State of art and future research agenda. *Manag. Rev. Q.* **2023**, 1–25. [CrossRef]
15. Zhang, L.; Li, D.; Cao, C.; Huang, S. The influence of greenwashing perception on green purchasing intentions: The mediating role of green word-of-mouth and moderating role of green concern. *J. Clean. Prod.* **2018**, *187*, 740–750. [CrossRef]
16. Pagiaslis, A.; Krontalis, A.K. Green Consumption Behavior Antecedents: Environmental Concern, Knowledge, and Beliefs. *Psychol. Mark.* **2014**, *31*, 335–348. [CrossRef]
17. Liobikienė, G.; Poškus, M.S. The Importance of Environmental Knowledge for Private and Public Sphere Pro-Environmental Behavior: Modifying the Value-Belief-Norm Theory. *Sustainability* **2019**, *11*, 3324. [CrossRef]

18. Kilbourne, W.; Pickett, G. How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *J. Bus. Res.* **2008**, *61*, 885–893. [\[CrossRef\]](#)
19. Minton, A.P.; Rose, R.L. The Effects of Environmental Concern on Environmentally Friendly Consumer Behavior: An Exploratory Study. *J. Bus. Res.* **1997**, *40*, 37–48. [\[CrossRef\]](#)
20. Nguyen, T.K.C.; Pham, S.H.; Nguyen, T.T.N.; Do, H.G.; Ngo, T.N. Investigating the determinants of green consumption intention. *J. Int. Econ. Manag.* **2021**, *21*, 73–90. [\[CrossRef\]](#)
21. Urbański, M.; Haque, A. Are You Environmentally Conscious Enough to Differentiate between Greenwashed and Sustainable Items? A Global Consumers Perspective. *Sustainability* **2020**, *12*, 1786. [\[CrossRef\]](#)
22. Nygaard, A.; Silkoset, R. Sustainable development and greenwashing: How blockchain technology information can empower green consumers. *Bus. Strategy Environ.* **2022**; early view. [\[CrossRef\]](#)
23. Sun, Y.; Shi, B. Impact of Greenwashing Perception on Consumers’ Green Purchasing Intentions: A Moderated Mediation Model. *Sustainability* **2022**, *14*, 12119. [\[CrossRef\]](#)
24. Montero-Navarro, A.; González-Torres, T.; Rodríguez-Sánchez, J.-L.; Gallego-Losada, R. A bibliometric analysis of greenwashing research: A closer look at agriculture, food industry and food retail. *Br. Food J.* **2021**, *123*, 547–560. [\[CrossRef\]](#)
25. Yang, Z.; Nguyen, T.T.H.; Nguyen, H.N.; Nguyen, T.T.N.; Cao, T.T. Greenwashing behaviours: Causes, taxonomy and consequences based on a systematic literature review. *J. Bus. Econ. Manag.* **2020**, *21*, 1486–1507. [\[CrossRef\]](#)
26. Jong, M.D.T.; Huluba, G.; Beldad, A.D. Different Shades of Greenwashing: Consumers’ Reactions to Environmental Lies, Half-Lies, and Organizations Taking Credit for Following Legal Obligations. *J. Bus. Tech. Commun.* **2020**, *34*, 38–76. [\[CrossRef\]](#)
27. Ha, M.-T.; Ngan, V.T.K.; Nguyen, P.N.D. Greenwash and green brand equity: The mediating role of green brand image, green satisfaction and green trust and the moderating role of information and knowledge. *Bus. Ethics Environ. Responsib.* **2022**, *31*, 904–922. [\[CrossRef\]](#)
28. Jog, D.; Singhal, D. Greenwashing Understanding Among Indian Consumers and Its Impact on Their Green Consumption. *Glob. Bus. Rev.* **2020**, 0972150920962933. [\[CrossRef\]](#)
29. Junior, S.B.; Martínez, M.P.; Correa, C.M.; Moura-Leite, R.C.; Da Silva, D. Greenwashing effect, attitudes, and beliefs in green consumption. *RAUSP Manag. J.* **2019**, *54*, 226–241. [\[CrossRef\]](#)
30. Bulut, C.; Nazli, M.; Aydin, E.; Haque, A.U. The effect of environmental concern on conscious green consumption of post-millennials: The moderating role of greenwashing perceptions. *Young Consum.* **2021**, *22*, 306–319. [\[CrossRef\]](#)
31. Jong, M.D.T.; Harkink, K.M.; Barth, S. Making Green Stuff? Effects of Corporate Greenwashing on Consumers. *J. Bus. Tech. Commun.* **2018**, *32*, 77–112. [\[CrossRef\]](#)
32. Nguyen, T.T.H.; Yang, Z.; Nguyen, N.; Johnson, L.W.; Cao, T.K. Greenwash and Green Purchase Intention: The Mediating Role of Green Skepticism. *Sustainability* **2019**, *11*, 2653. [\[CrossRef\]](#)
33. Yildirim, S. Greenwashing: A rapid escape from sustainability or a slow transition? *LBS J. Manag. Res.* **2023**; ahead-of-print. [\[CrossRef\]](#)
34. Leonidou, C.N.; Skarmas, D. Gray Shades of Green: Causes and Consequences of Green Skepticism. *J. Bus. Ethics* **2017**, *144*, 401–415. [\[CrossRef\]](#)
35. Testa, F.; Iovino, R.; Iraldo, F. The circular economy and consumer behaviour: The mediating role of information seeking in buying circular packaging. *Bus. Strategy Environ.* **2020**, *29*, 3435–3448. [\[CrossRef\]](#)
36. Testa, F.; Iraldo, F.; Vaccari, A.; Ferrari, E. Why Eco-labels can be Effective Marketing Tools: Evidence from a Study on Italian Consumers. *Bus. Strategy Environ.* **2015**, *24*, 252–265. [\[CrossRef\]](#)
37. Santos-Corrada, M.D.L.M.; Méndez-Tejeda, R.; Flecha-Ortiz, J.A.; Lopez, E. An analysis of sustainable consumption practices through the role of the consumer behavior in the circular economy. *J. Consum. Behav.* **2023**; early view. [\[CrossRef\]](#)
38. Prados-Peña, M.B.; Gálvez-Sánchez, F.J.; Núñez-Cacho, P.; Molina-Moreno, V. Intention to purchase sustainable craft products: A moderated mediation analysis of the adoption of sustainability in the craft sector. *Environ. Dev. Sustain.* **2022**. [\[CrossRef\]](#)
39. Bigliardi, B.; Filippelli, S.; Quinto, I. Environmentally-conscious behaviours in the circular economy. An analysis of consumers’ green purchase intentions for refurbished smartphones. *J. Clean. Prod.* **2022**, *378*, 134379. [\[CrossRef\]](#)
40. Zhuang, W.; Luo, X.; Riaz, M.U. On the Factors Influencing Green Purchase Intention: A Meta-Analysis Approach. *Front. Psychol.* **2021**, *12*, 644020. [\[CrossRef\]](#) [\[PubMed\]](#)
41. Gomes, G.M.; Moreira, N.; Ometto, A.R. Role of consumer mindsets, behaviour, and influencing factors in circular consumption systems: A systematic review. *Sustain. Prod. Consum.* **2022**, *32*, 1–14. [\[CrossRef\]](#)
42. Borrello, M.; Caracciolo, F.; Lombardi, A.; Pascucci, S.; Cembalo, L. Consumers’ Perspective on Circular Economy Strategy for Reducing Food Waste. *Sustainability* **2017**, *9*, 141. [\[CrossRef\]](#)
43. Duarte, K.d.S.; Lima, T.A.d.C.; Alves, L.R.; Rios, P.A.d.P.; Motta, W.H. The circular economy approach for reducing food waste: A systematic review. *Rev. Produção Desenv.* **2021**, *7*, 1–20. [\[CrossRef\]](#)
44. Hebrok, M.; Boks, C. Household food waste: Drivers and potential intervention points for design—An extensive review. *J. Clean. Prod.* **2017**, *151*, 380–392. [\[CrossRef\]](#)
45. Aschemann-Witzel, J.; De Hooge, I.; Amani, P.; Bech-Larsen, T.; Oostindjer, M. Consumer-Related Food Waste: Causes and Potential for Action. *Sustainability* **2015**, *7*, 6457–6477. [\[CrossRef\]](#)
46. Berki-Kiss, D.; Menrad, K. Ethical consumption: Influencing factors of consumer’s intention to purchase Fairtrade roses. *Clean. Circ. Bioeconomy* **2022**, *2*, 100008. [\[CrossRef\]](#)

47. Pordata. População Residente: Total e por Grandes Grupos Etários. Available online: <https://www.pordata.pt/portugal/populacao+residente+total+e+por+grandes+grupos+etarios-513> (accessed on 13 July 2023).
48. Hair, J.F.; Sarstedt, M.; Ringle, C.M. Rethinking some of the rethinking of partial least squares. *Eur. J. Mark.* **2019**, *53*, 566–584. [[CrossRef](#)]
49. Ringle, C.M.; Wende, S.; Becker, J.-M. SmartPLS 3. SmartPLS GmbH, Boenningstedt. *J. Serv. Sci. Manag.* **2015**, *10*, 32–49.
50. Leguina, A. A primer on partial least squares structural equation modeling (PLS-SEM). *Int. J. Res. Method Educ.* **2015**, *38*, 220–221. [[CrossRef](#)]
51. Nyilasy, G.; Gangadharbatla, H.; Paladino, A. Perceived Greenwashing: The Interactive Effects of Green Advertising and Corporate Environmental Performance on Consumer Reactions. *J. Bus. Ethics* **2014**, *125*, 693–707. [[CrossRef](#)]
52. Vries, G.; Terwel, B.W.; Ellemers, N.; Daamen, D.D.L. Sustainability or Profitability? How Communicated Motives for Environmental Policy Affect Public Perceptions of Corporate Greenwashing. *Corp. Soc. Responsib. Environ. Manag.* **2015**, *22*, 142–154. [[CrossRef](#)]
53. Johnstone, M.-L.; Tan, L.P. Exploring the Gap Between Consumers' Green Rhetoric and Purchasing Behaviour. *J. Bus. Ethics* **2015**, *132*, 311–328. [[CrossRef](#)]
54. Mazar, N.; Zhong, C.-B. Do green products make us better people? *Psychol. Sci.* **2010**, *21*, 494–498. [[CrossRef](#)]
55. White, K.; Habib, R.; Hardisty, D.J. How to SHIFT Consumer Behaviors to be More Sustainable: A Literature Review and Guiding Framework. *J. Mark.* **2019**, *83*, 22–49. [[CrossRef](#)]
56. Stern, P.C. New Environmental Theories: Toward a Coherent Theory of Environmentally Significant Behavior. *J. Soc. Issues* **2000**, *56*, 407–424. [[CrossRef](#)]
57. Lyon, T.P.; Montgomery, A.W. The means and end of greenwash. *Organ. Environ.* **2015**, *28*, 223–249. [[CrossRef](#)]
58. Xiao, C.; McCright, A.M. Gender differences in environmental concern: Revisiting the institutional trust hypothesis in the USA. *Environ. Behav.* **2015**, *47*, 17–37. [[CrossRef](#)]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.