



Research article

Understanding the determinants of sustainable consumption behavior: Insights from a meta and weight analysis

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ABSTRACT

Consumer choices regarding sustainable products have been studied over decades, often seen as a means for individuals to mitigate environmental problems. However, the adoption of sustainable products remains below expectations, raising relevant questions about the determinants of these choices. Therefore, this study conducts a meta and weight analysis of 41 peer-reviewed studies published between 2008 and 2023, sourced from databases including Scopus, Web of Science, and Google Scholar. Due to the meta-analysis requirement, this study focuses only on 18 relationships, since only the ones examined three or more times can be considered. The meta-analysis identified 12 statistically significant predictors of sustainable products consumption, from which the weight analysis highlighted six as best predictors. Results reveal the theory of planned behavior as a major theoretical framework used in previous research, along with consumer-related factors and sociodemographic variables such as knowledge, environmental behavior, and past experience. From a product perspective, safety was also found to be a statistically significant predictor. By integrating findings from both analyses, this study provides a comprehensive overview of the key factors influencing sustainable consumption choices, offering insights into the current state of the field and identifying areas for future research.

1. Introduction

While rapid technological and industrial advancement has provided many benefits, it has also set many climate and environmental challenges (Joshi and Rahman, 2017). Several strategies have been developed to fight the climate change problems. At the individual level, the choice of sustainable products has been indicated as one main contributor to mitigate environmental issues. In fact, individuals tend to ignore the impact their consumption choices have on the environment, leading to the fast and exhaustive consumption of several products that, in some or all steps of their lifecycle, damage the environment (Laukkanen et al., 2022). It is precisely on this scenario that the sustainable consumption concept has been developed. Individuals may opt for sustainable, sometimes called green products, that minimize the use of natural resources, and the pollutant emissions produced (Joshi and Rahman, 2017). According to the European Union's Ecodesign for Sustainable Products Regulation (ESPR), a sustainable product presents one or some of the following characteristics: uses less energy, has a lower environmental impact, can be repaired, recycled or contains recycled materials, and contains less substances of concern (e.g. pesticides) (European

Commission, 2024).

Therefore, consumers' choice of green products has been investigated over decades and has been seen as a way for individuals to prevent or decrease environmental damage. Nevertheless, the consumers' adoption of sustainable products is still low, leading to the relevant question of which factors motivate this choice (Joshi et al., 2021a,b). When compared with traditional - non-sustainable products, sustainable ones don't necessarily provide any new functionality or better value besides a possible satisfaction by contributing to sustainability, and although many governments have provided some benefits and financial support to encourage the consumption of these products, this is still far behind the expected (Eslami and Krishnan, 2023).

In order to speed up the adoption of sustainable products, it is of major relevance to understand the main motivations and concerns for consumers to choose them. These insights will not only allow businesses to align their strategies to the targeted consumer motivations, but will overall contribute to the mitigation of environmental issues, reinforcing the importance of individuals as relevant actors in fighting climate change (Rezvani et al., 2018). For all these reasons, several studies have used different theoretical perspectives to investigate why consumers

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adopt sustainable products, revealing a maturity on the topic. At the same time, the literature on the field is scattered and, especially given the low adoption of green products, it is important to summarize past research and clarify possible conflicted results (Rezvani et al., 2018).

Given this, the main objective of this study is to identify and evaluate the key determinants that influence consumers' adoption of sustainable products. Therefore, a clear guiding research question emerges: "What are the main determinants influencing consumers' decisions to choose sustainable products?". To achieve this, a meta and weight analysis is performed on the topic, allowing to synthesize results from prior studies, even using different techniques and samples, evaluating and quantifying the most investigated factors. The meta-analysis allows us to concisely understand the topic, even when contradictory or conflicted results exist, uncovering relationships, disparities, and gaps in the field (Schmidt and Hunter, 2016). On the other side, the weight analysis provides an identification of the best and promising indicators used to explore sustainable consumption choices (Urbach et al., 2009).

Therefore, this study makes the following contributions. First, integrating a meta and weight analysis will contribute to a clearer and consistent view of the determinants of sustainable consumption behaviors, providing a synthesized view of the progress in the field. While several reviews and meta-analyses have explored factors influencing sustainable product consumption, few studies have combined meta-analysis with weight analysis to both quantify effect sizes and evaluate the predictive strength of various factors. This dual methodological approach allows for a more comprehensive understanding by not only synthesizing quantitative results but also identifying the most reliable and promising predictors. Thus, this study offers a novel and valuable contribution to the literature, providing both theoretical insights and practical guidance for advancing sustainable consumption research and application. Second, the identification of the most used and relevant motivators and barriers to consumers' choice of sustainable products will (1) facilitate theory development – from a theoretical perspective –, and (2) contribute to the enhancement of sustainable products' adoption – from a practical point of view – providing several recommendations for businesses and practitioners helping in the development of more targeted strategies.

The paper is structured as follows. Section 2 presents the research methodology with a description of the selected criteria and studies. Section 3 presents the results, including descriptive statistics and the meta and weight analysis results. The subsequent section discusses the results, implications, limitations, and future research directions. Finally, section 5 presents the conclusions.

2. Background of analysis

Research on sustainable consumption behavior has expanded rapidly in the last two decades, with scholars seeking to identify psychological, cultural, and economic predictors of environmentally responsible choices. The theory of planned behavior (TPB) (Ajzen, 1985) has served as a foundational framework, positing that attitudes, subjective norms, and perceived behavioral control influence intention and, ultimately, behavior. Many studies on sustainable consumption have since adapted and extended TPB to account for diverse product categories, from organic food to certified wood (Hansmann et al., 2020). These studies highlight the relevance of environmental concern, personal norms, past experience, and perceived consumer effectiveness as recurring predictors.

In particular, Ahmad et al. (2023) explored the role of trust in corporate social responsibility during the COVID-19 pandemic, showing that pro-environmental identity and environmental knowledge significantly enhance green purchase intentions. Similarly, Lavuri et al. (2023) confirmed that pro-environmental identity and environmental knowledge influence green consumer behavior, especially when moderated by eco-literacy. A work by (Akehurst et al., 2012) revisited socio-demographic and psychographic profiles of green consumers,

showing that perceived consumer effectiveness and altruism are more relevant than the sociodemographic ones. Also, (Gajdzik et al., 2023) research has pointed out that behavior may change according to the type of consumer, namely, the ones more focused on high quality, those intending to save money, those dedicated in saving time and those derived by pleasure while shopping – being the ones more impulsive and less adherent to planned shopping lists. Finally, emerging 2025 research also shows other evolving themes. Neves et al. (2024) explored sustainable behavior connected to the use of sustainable technologies, extending UTAUT2 theory to sustainable contexts.

Despite these valuable insights, there remains a lack of synthesis in the field. The diversity of predictors, theoretical frameworks, and consumer types has resulted in a fragmented understanding of what drives sustainable consumption. No prior study has systematically identified, compared, and weighted the most frequently tested predictors across a broad set of recent empirical studies.

3. Research methodology

3.1. Study search and selection

A thorough search of papers was conducted in April 2024 on well-known scientific databases, namely Scopus, Science Direct, and Web of Science (Webster and Watson, 2002). On those, queries were built using the available logical operators and using relevant keywords such as sustainable consumption, sustainable agriculture, sustainable fishery, sustainable forestry, green consumption, sustainable consumption behavior, sustainable products, green products, adoption, use, and purchase, among others. According to ESPR' definition and prior research, green and sustainable consumption and purchase are related to buying eco-friendly or organic products (Dong et al., 2020); therefore, the chosen keywords were aligned with this definition. The main search string was: ("consumption behavior" OR "consumer behavior" OR "sustainable consumption") AND ("model" OR "survey" OR "questionnaire"). This search was applied to all available fields. The initial search found 1281 papers. Nevertheless, a set of selection criteria was established to refine the research scope and meet the meta and weight analysis requirements. The following criteria were defined: (1) studies published under a peer-review process; (2) studies analysed at an individual/consumer level; (3) quantitative studies providing correlation and sample sizes; (4) independent datasets. After applying the inclusion criteria, studies were further screened according to exclusion criteria to ensure data quality and relevance. Excluded articles included duplicates, studies without adequate statistical data (missing correlation coefficients or sample sizes), those with incomplete or inconsistent methodology, non-peer-reviewed publications, and non-English language articles. This process resulted in the final selection of 41 studies for analysis. The following data was extracted from each paper: publication year, source, independent variable, dependent variable, the correlation coefficient of each relationship, significance, method, sample size, country, and journal. Fig. 1 presents the selection and screening process, with 1281 initial articles. The screening process delivered 255 articles when excluding the ones out of scope, such as at firm or industry level, marine policies, energy poverty, vegan with no relation to sustainability, farmers and fisherman practices, among others. This screening was done by checking the title and abstract. Additionally, articles that were solely qualitative and without theoretical models were also excluded, summing up to 90 articles. This was done by checking the methodology section mainly. Finally, all articles that did not show correlation coefficients or sample sizes were also excluded. Methodology and results section was investigated on this phase. A total of 41 articles was therefore achieved.

3.2. Data extraction and coding

A merge of variables with similar meanings is needed to proceed with

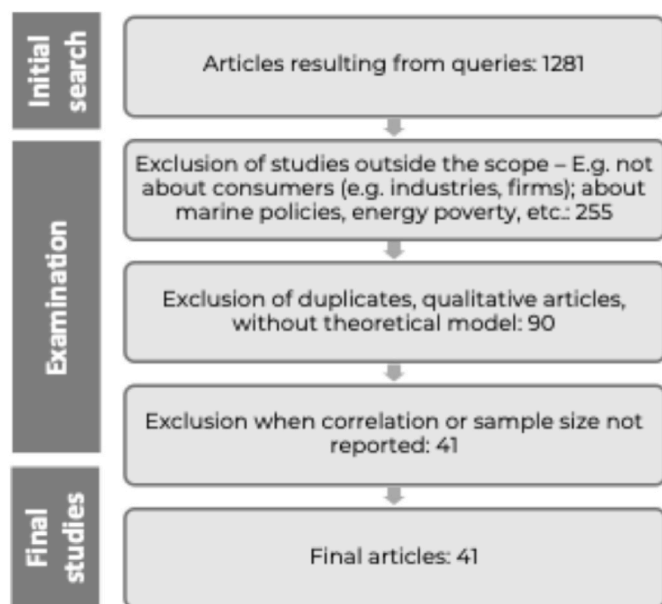


Fig. 1. Selection process.

the meta and weight analysis. Therefore, both dependent and independent variables were extracted from the papers selected. When variables had the same meaning, or similar items, even if named differently, they were given an identical designation, harmonizing the concepts and therefore increasing the meta-analysis precision. Decisions on merging were made by two independent researchers, with disagreements resolved through discussion to maintain objectivity. This harmonization increased the precision of the meta-analysis by reducing conceptual overlap. A complete list of original and harmonized variables is provided in [Appendix A](#). After the merging process, 202 relationships were analysed, and 91 distinct relationships were identified. From those, two independent variables were identified – attitude and sustainable product consumption. However, only relationships that occurred three or more times can be selected for the meta-analysis (Neves et al., 2022). Thus, only 18 relationships were analysed, all related to the target variable sustainable products consumption. Sustainable products consumption comprises factors related to the choice, purchase, and/or consumption behavior of sustainable, green, or organic products.

3.3. Meta-analysis procedures

Regarding the meta-analysis, this method allows to summarize quantitative results from several works, providing a synthesized and consolidated view of the topic (Bommer et al., 2022). To be able to conduct a meta-analysis, one needs to have data on the effect and sample sizes (Roth et al., 2018). Having this, the method provides a pooled estimate of the explanatory variables on the target ones, being corrected by sample size. For this estimation, the random-effects model was used since it considers within and between variance among works (Borenstein et al., 2010). The meta-analysis was conducted using R software with the metafor package. The restricted maximum likelihood (REML) estimator was used to estimate between-study variance. Heterogeneity was assessed via Cochran's Q test and the I^2 statistic. [Table 2](#) presents the meta and weight analysis results.

3.4. Weight analysis procedures

Regarding the weight analysis, this method allows to provide a category for the independent variables according to their predictive power, i.e., strength as a predictor (Jeyaraj et al., 2006). Therefore, the cumulative impact of the independent variables is named as weight and

Table 1
Summary of selected journals.

Journal	Total	Papers
Appetite	6	(Claessens et al., 2023; Koklic et al., 2019; Lang and Rodrigues, 2022; Liu et al., 2021; Siegrist and Hartmann, 2019; Stranieri et al., 2017)
Aquaculture	1	Budhathoki et al. (2022)
Ecological Economics	4	(Hoffmann et al., 2019; Johe and Bhullar, 2016; Joshi and Rahman, 2019; Vermeir and Verbeke, 2008)
Food Quality and Preference	3	(Hempel and Roosen, 2022; Pieniak et al., 2010; Qi and Ploeger, 2021)
Forest Policy and Economics	2	(Brusselsaers et al., 2020; Panico et al., 2022)
International Journal of Gastronomy and Food Science	1	Azlie et al. (2023)
Journal of Cleaner Production	14	(Ahmad et al., 2023; Biswas and Roy, 2015; Caniels et al., 2021; Chekima et al., 2016; Costa et al., 2021; Dong et al., 2020b; Hansmann et al., 2020; Joshi et al., 2021a,b; Parashar et al., 2023; Peiró Signes et al., 2023; Sultan et al., 2021; Talwar et al., 2021; Vittersø and Tangeland, 2015; Wang et al., 2014)
Journal of Environmental Management	2	(Al Mamun et al., 2018; Lavuri et al., 2023)
Journal of Nutrition Education and Behavior	1	(Robinson and Smith, 2002)
Marine Policy	2	(Ding et al., 2022; Hori et al., 2020)
Materials Today: Proceedings	1	Suryavanshi et al. (2023)
Procedia - Social and Behavioral Sciences	1	Kabadayı et al. (2015)
Sustainable Production and Consumption	2	(Joshi and Rahman, 2017; Wang and Hao, 2018)
Technological Forecasting & Social Change	1	Chen and Hung (2016)

is calculated by dividing the number of times the variable is significant by the number of times that specific variable was analysed in a specific relationship. Therefore, a weight equal to one refers to a variable whose relationships were all statistically significant, whether a weight of zero means otherwise. The weight analysis provided two categories – best predictor (BP) and promising predictor (PP) – according to the following criteria. If a variable is analysed five or more times, it is considered well-utilized. Then, from these, if they present a weight greater or equal to .8, then the indicator is classified as best predictor. If the variable is tested less than five times but still has a weight equal to one, then it is categorized as promising predictor.

4. Results

4.1. Descriptive statistics

Each of the selected paper was thoroughly examined. Regarding the sample size, [Fig. 2](#) presents the sample size cumulative distribution per country. China, Japan, and India are the countries with the most respondents, with 21 %, 13 %, and 12 % of the respondents, respectively. It is relevant to state that a larger sample size does not necessarily mean a greater number of studies conducted in the country. In this case, China and India are the countries with more works considered. Acknowledging these statistics is essential, however, the applied method is robust to these situations, since the effect sizes are corrected by sample size. Other countries namely Norway, United States, Australia, Belgium, Malaysia, Italy, Germany, Switzerland, Slovenia, Taiwan, Poland, Brazil, and Turkey are also represented in the selected studies and named in a descending way, with a percentage from 9 % to 1 %.

Regarding the journals and research period, the selected works range from 2008 to 2023, with a notable increase in the last five years, varying from food, marine, and materials-related journals. [Fig. 3](#) presents the

Table 2
Meta and weight analysis results.

Variable	O	N	r	CI (95 %)	Q	I ²	FNS	Egger	Weight	Type	
Attitude	19	8802	.378	.252	.492	795.74*	97.7 %	17,486	.450	.89	BP
Subjective norms	14	4344	.321	.220	.415	117.43*	92.3 %	2338	.348	.93	BP
Environment consciousness	11	46,450	.269	.199	.336	183.73*	94.6 %	6441	.397	1	BP
Perceived behavior control	9	4823	.407	.226	.560	385.16*	97.9 %	4826	.052	1	BP
Environmental behavior	8	84,159	.119	.010	.226	1114.73*	99.4 %	4726	.452	.88	BP
Knowledge	7	3810	.286	.113	.442	190.16*	96.8 %	1160	.730	1	BP
Price	6	6165	-.022	-.129	.084	64.59*	92.3 %	31	.405	.33	
Trust in certified label	6	5049	.477	-.043	.794	1902.18*	99.7 %	40,029	.811	1	BP
Gender	5	46,269	.119	-.004	.240	223.62*	98.2 %	465	.489	.60	
Age	4	45,719	.108	.034	.181	50.52*	94.1 %	567	.504	1	PP
Health consciousness	4	6588	.424	-.017	.727	409.06*	99.3 %	1701	.287	1	PP
Perceived consumer effectiveness	4	1327	.448	.096	.700	146.00*	97.9 %	979	.490	.75	
Income	4	6922	.140	.117	.163	1.79	.0 %	115	.051	1	PP
Past experience	3	888	.607	.002	.886	206.58*	99.0 %	2692	.980	1	PP
Education	3	6677	.154	.069	.236	10.63*	81.2 %	180	.060	1	PP
Trust	3	1357	.190	-.056	.415	41.68*	95.2 %	48	.114	.67	
Quality	3	5304	.032	-.143	.206	67.79*	97.0 %	3	.899	.67	
Safety	3	3775	.196	.072	.315	16.05*	87.5 %	92	.082	1	PP

Note: (O) number of observations taken from the analysis of the studies; (N) number of accumulated samples of the assessed studies; r = correlation found in the studies correct by sample size; CI (95 %) = confidence interval; Q = test of heterogeneity at the individual; I² = scale-free index of heterogeneity; (*) = p < .01; ns = not significant; NC = not calculated; Egger's intercept = Asymmetry test.

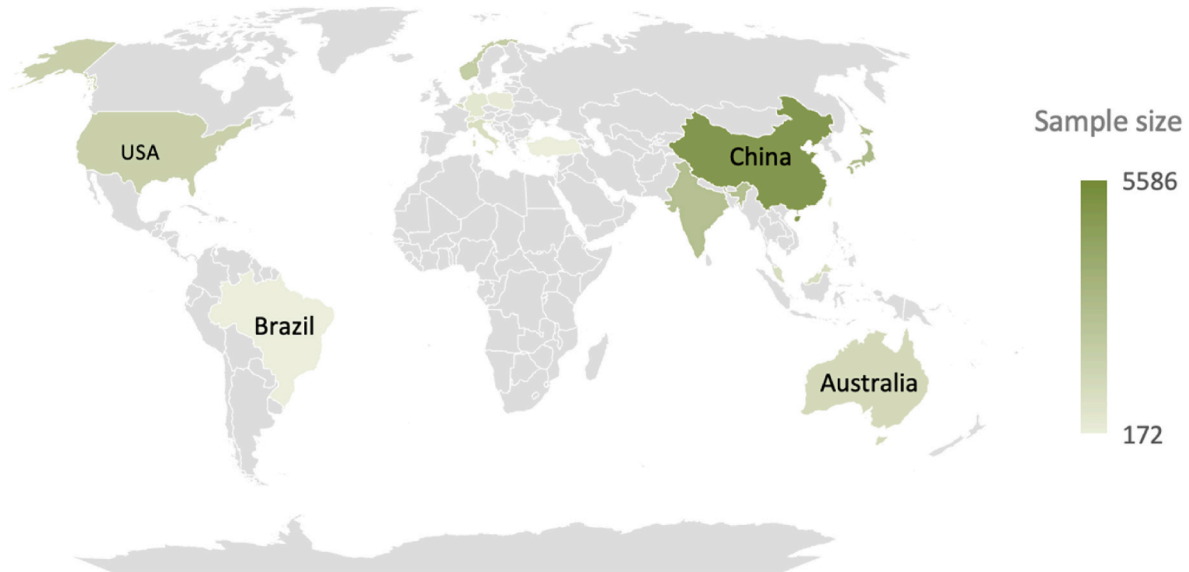


Fig. 2. Sample size cumulative distribution per country.

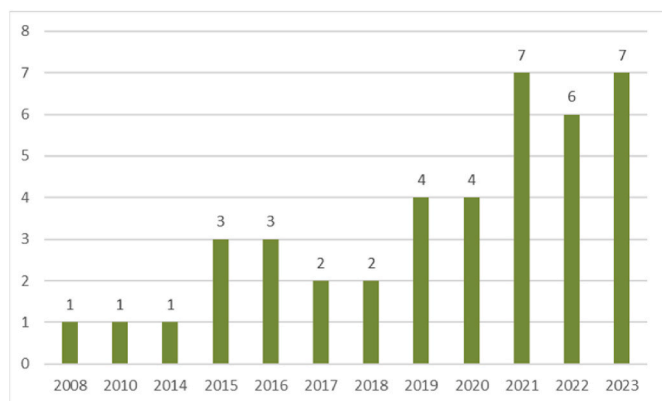


Fig. 3. Summary of selected studies per year.

distribution of studies per year and Table 1 presents the selected studies per journal.

4.2. Meta and weight analysis results

Table 2 presents the meta and weight analysis results. Regarding heterogeneity evaluation, the Cochran's Q test and the I² index were used. In the first, the heterogeneity is assessed using the significance level, while in the I², the heterogeneity ranges from 0 % to 100 % (Higgins and Thompson, 2002). Most relationships showed high heterogeneity (I² often above 75 %), reflecting considerable variation across studies. This heterogeneity likely arises from differences in cultural contexts, measurement tools, sample demographics, and study designs. For instance, consumer motivations may vary widely between countries with different environmental policies or market maturity. Such variability suggests that while the overall trends are reliable, contextual factors moderate these effects, pointing to avenues for future research. Additionally, the failsafe number (FNS) was analysed. This measure consists of the number of non-significant or unpublished

studies necessary to refute each tested relationship's findings (Rosenthal, 1979). The FSN assesses the robustness of the meta-analysis results against potential publication bias, i.e., addresses the concern related to the possibility of significant or positive results being more likely to be published, potentially skewing the overall findings. The fail-safe number (FSN) analysis further supports the robustness of these findings. Large FSN values indicate that a substantial number of unpublished or non-significant studies would be needed to overturn the observed significant effects, mitigating concerns about publication bias.

Finally, the effect sizes were evaluated. Among the 18 relationships analysed, 12 were statistically significant. The strongest predictor was past experience ($r = .607$), indicating that consumers who have previously used sustainable products are more likely to continue doing so. This supports theories emphasizing habit formation and consumer familiarity as important behavioral drivers. Other strong predictors include perceived consumer effectiveness ($r = .448$), attitude ($r = .378$), and subjective norm ($r = .321$). These findings align well with established behavioral frameworks like the Theory of Planned Behavior, where personal attitudes and perceived social pressures influence purchasing decisions. Variables such as knowledge ($r = .286$), perceived behavioral control ($r = .269$), and environmental consciousness ($r = .269$) also showed meaningful effects, highlighting the importance of

awareness and perceived agency in encouraging sustainable consumption. Variables like safety, education, income, environmental behavior, and age demonstrated smaller yet significant effect sizes (ranging from .108 to .196), suggesting these factors also contribute but may be less central drivers.

Regarding the weight analysis, of the 18 independent variables, seven are best predictors, and six are promising indicators. The best predictors are attitude, subjective norms, environmental consciousness, perceived behavioral control, environmental behavior, knowledge, and trust in certified label, each demonstrating both frequent investigation and strong predictive power. Six other variables were classified as promising predictors, indicating consistent significance despite being less studied. This categorization helps identify focal areas for both theory development and practical marketing interventions.

Fig. 4 presents the results from the meta-analysis, divided into four main categories of determinants: TPB theory, product-related factors, consumer-related factors, and socio-demographic factors.

5. Discussion

Sustainable consumption behavior has been a well-developed topic over the last decades. Understanding the determinants of consumers'

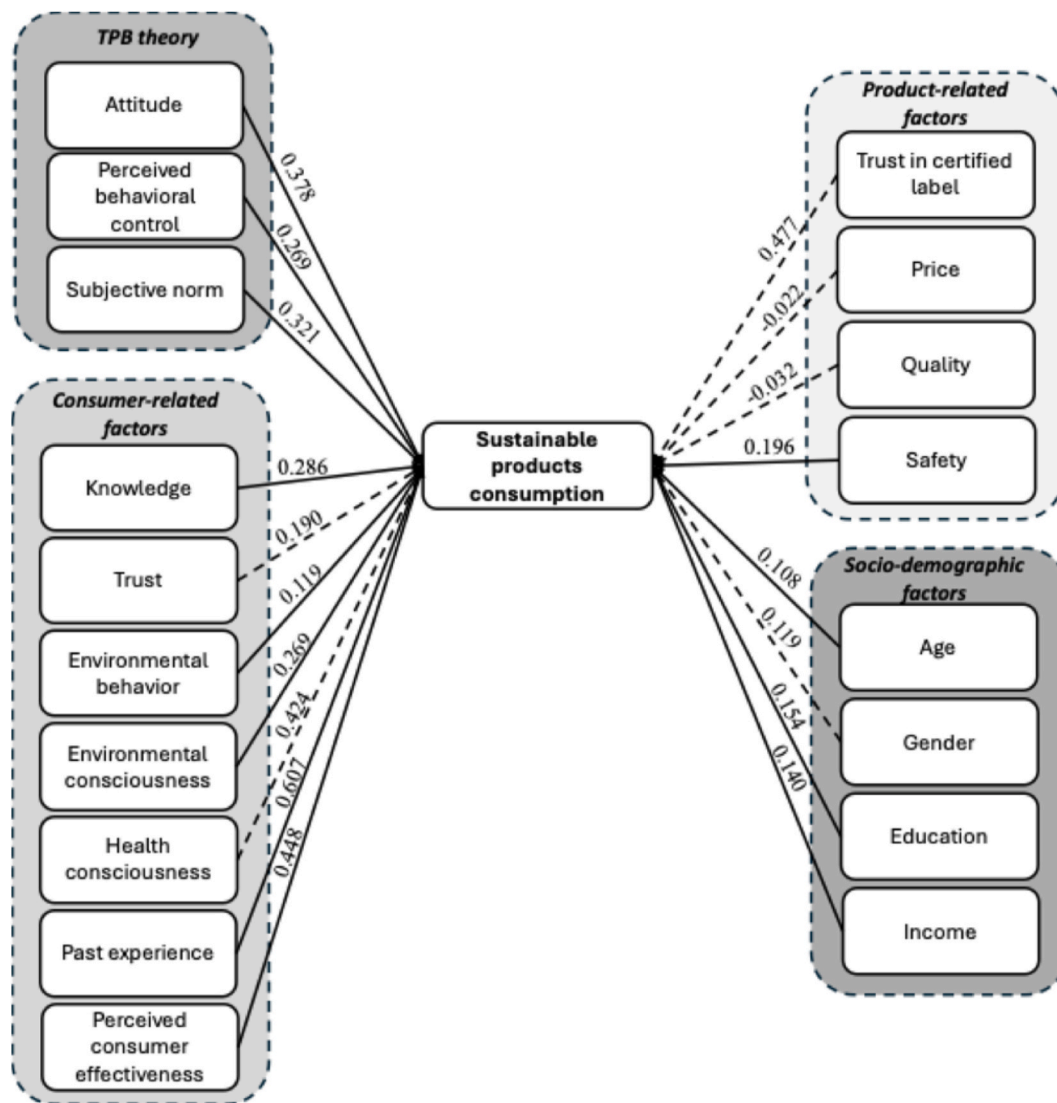


Fig. 4. Resulting model from the meta-analysis.

Note: Numerical values represent the average β . Continuous arrows represent statistically significant predictors.

choice of sustainable products is relevant as it helps mitigate the existing fast consumption models and contributes to a more sustainable environment. Overall, this topic has had a growing interest from both researchers and practitioners, given the benefits of choosing sustainably. Given this, 41 papers were analysed, identifying and quantifying the most relevant factors impacting consumers' sustainable choices. The meta and weight analysis provides an overview of the state of the art on the topic, summarizing the main findings and opening room for future research and theory development.

First, it is possible to identify four main sets of factors affecting sustainable products consumption, namely, theory of planned behavior (TPB) variables, product-related factors, consumer-related factors, and sociodemographic variables. The strong influence of TPB variables across multiple studies reaffirms their foundational role in explaining sustainable consumption behavior, with attitude ($r = .378$), subjective norms ($r = .321$), and perceived behavioral control ($r = .269$) all emerging as statistically significant predictors with moderate effect sizes. These variables also achieved the "best predictor" status in the weight analysis, emphasizing their consistent importance across studies. Attitude and subjective norms are on top as best predictors and with greater correlation coefficients, suggesting the relevance of both individuals' evaluations and the perceived social pressure to engage in such behaviors. These findings underscore the importance of targeting both personal beliefs and social influence in interventions aimed at promoting sustainable consumption. Nevertheless, results prove that theories have been extended with other – also relevant – variables.

From the product-related factors, only safety emerged as statistically significant, albeit with a smaller effect size ($r = .196$) and categorized as a promising predictor due to limited testing frequency. This suggests a gap in literature where product attributes beyond safety, such as design, price, or quality, are underexplored in the context of sustainable consumption. Although the belief that the product is safe will increase its consumption, this is still a promising indicator implying that few studies have evaluated this type of factor. Indeed there is a need for future research to explore boundary conditions and integrate additional psychosocial factors to refine TPB's explanatory power in sustainable contexts.

From the consumer perspective, variables like knowledge ($r = .286$), environmental consciousness ($r = .269$), environmental behavior ($r = .119$), past experience ($r = .607$), and perceived consumer effectiveness ($r = .448$) all showed statistically significant relationships with sustainable consumption. The particularly strong effect size for past experience positions it as the most potent predictor in the meta-analysis, indicating that repeated engagement with sustainable products reinforces continued behavior. This aligns with behavior-change theories emphasizing habit formation and experiential learning. The weight analysis confirmed that knowledge, environmental consciousness, and perceived consumer effectiveness are "best predictors," supporting the critical role of consumer awareness and belief in individual impact. These findings emphasize the importance of educational campaigns and empowerment strategies to foster sustainable consumer behavior. Overall, these findings suggest the relevance of creating knowledgeable and informed consumers. This will not only potentiate the consumption of green products but also create more informed and literate consumers. Additionally, the more the individual performs any environmental behavior or shows concern and consciousness about the environment, the greater will be their consumption of sustainable products. This finding has long been uncovered in prior research, even in similar topics such as adopting sustainable energy technologies (Mateus et al., 2023) or participating in local energy communities (Neves et al., 2024). Finally, past experience and the individual's belief in their ability to make a meaningful impact on environmental or societal issues through their consumption choices is of major relevance, with a notable mention of the past experience factor as the statistically significant predictor with the greatest impact. This shows a certain willingness to continue to choose sustainably, suggesting that the main difficulty might be in

making consumers to start to opt for sustainable products instead of securing its continuous behavior.

Lastly, sociodemographic variables were found relevant, showing age ($r = .108$), education ($r = .154$), and income ($r = .140$) being positively associated with sustainable product consumption, although effect sizes were smaller compared to consumer-related factors. This suggests a certain status associated with the sustainable lifestyle, where highly educated and high-income individuals are the ones who can opt for sustainable products. This phenomenon has been recently studied and opens a new perspective on why people choose sustainable products, unravelling the angle of sense of belonging and the willingness to make part of a mainstream of society through this type of sustainable behavior and choices (Fontan et al., 2023).

5.1. Insights on non-significant predictors

In addition to the significant factors discussed, several predictors were found to have no statistically significant effect on sustainable product consumption, including price, trust in certified labels, gender, health consciousness, trust, and quality. Understanding why these variables did not show significant relationships is crucial for a comprehensive interpretation of the results.

Price, often assumed to be a major barrier to sustainable consumption, surprisingly showed no consistent effect. This may reflect the complexity of pricing in consumer decisions, where price sensitivity varies across different markets and product types. Additionally, consumers motivated by sustainability might prioritize other factors over price, or perceive the price-quality trade-off differently in the context of green products.

Trust in certified labels and general trust were also non-significant, which could be due to heterogeneity in how trust is conceptualized and measured across studies. It may also indicate that while certification labels are important, their impact alone is insufficient to drive purchase decisions without accompanying factors such as awareness or perceived credibility. This opens future research for the need of digital product passports in which credible and easily accessible information about a product lifecycle can be accessed (Vahidi et al., 2024).

The absence of significant effects for gender and health consciousness suggests that this behavior is not necessarily a gender-based one, neither sustainable products are necessarily bought only because they are seen as healthy. Lastly, the quality of sustainable products did not emerge as a significant predictor. This could indicate that consumers may either assume comparable quality between sustainable and conventional products or that quality concerns are overshadowed by other motivational factors such as environmental impact. Nevertheless, we acknowledge that the lack of significance for these variables might also come from methodological inconsistencies or a limited number of studies examining these factors in sufficient detail, underscoring the need for more focused research. Future studies could investigate possible moderators or contextual influences that affect these relationships and explore why these predictors may play a weaker role than expected.

5.2. Theoretical implications

Regarding theoretical implications, this study provides a consolidated view of the state of the art on the determinants of sustainable consumption choices, resulting in a model that combines the cumulative effect of independent variables across multiple studies. This model suggests TPB has a well-utilized and robust theory in the context of sustainable consumption behaviors, but also reveals the need to extend it with other relevant variables such as product-related and consumer-related factors. Therefore, by encompassing these main dimensions, the produced model can be seen as a basis for future research and support theory development.

Additionally, it is relevant to note that although TPB is found to be

robust, other factors and theories can still be found and used to explain sustainable consumption behaviors. For example, only safety was found to be statistically significant in the set of product-related factors, leaving space for new investigations that can deepen the role of these factors.

5.3. Practical implications

In terms of practical implications, the findings provided by this study are strongly relevant in helping organizations and practitioners to improve consumers' sustainable choices and better answering to their needs and concerns. Several strategies can be developed by using the statistically significant predictors identified.

From the product perspective, safety was considered a relevant factor, revealing the importance of consistently informing the consumer about how the product was produced and the safety indicators. Past research shows that this factor is even more relevant in the food/organic food sector. Therefore, strategies should pass by developing labels or product passports that provide the consumer with all information about the product through its lifecycle (Vahidi et al., 2024). There are several types of passports, with the most common one being the digital product passport. This is a digital record of a product, comprising information about its origin, materials, specifications, impact and some recommendations. This strategy has been seen by the European Union (EU) as a way of being more transparent to consumers, having been proposed in the Ecodesign for Sustainable Products Regulation, as part of the EU's Circular Economy Action Plan (European Commission, 2024). Similar frameworks are being piloted or adopted in other regions, such as the China Green Product Certification system and the US Environmental Protection Agency's Safer Choice Program. Furthermore, governments should strengthen the regulation of eco-labels and certifications to ensure credibility and prevent greenwashing. The EU Ecolabel, the Nordic Swan Ecolabel, and the Forest Stewardship Council (FSC) are examples of trusted labels that governments can promote and regulate to provide consumers with reliable signals of sustainability. Policymakers can enforce stricter compliance and verification procedures for these certifications and develop consumer education campaigns to increase awareness of their significance.

From the consumers' perspective, knowledge and past experience were found to be statistically significant. The first factor suggests the need to increase literacy and information available about sustainable products. In fact, sustainable transformation not only demands green and innovative technologies or products, but also sustainable and innovative ways of living and well-informed consumers (Vita et al., 2019). Thus, some strategies may pass by educational campaigns, such as the development of workshops, forums, and influencers partnerships through social media. Additionally, point-of-sale information and dedicated green sections can help consumers to easily find information and clarify doubts on the products. Regarding the importance of past experience, results suggest the need for the consumer to have some sort of experience with green products. Therefore, from a marketing perspective, strategies like small product offerings, free samples, and giveaways can effectively create this first experience, facilitating the consumers' first contact with the product. Additionally, governments can partner with NGOs and private sector stakeholders to run public awareness campaigns, similar to the EU's "Green Week" or the US Environmental Protection Agency's Energy Star campaign, which use workshops, social media, and retail initiatives to educate and engage consumers.

Finally, from the sociodemographic point of view, higher education and income appear to be significant predictors. This finding strengthens the need to create more informed consumers, raising awareness of the benefits of choosing green products. Regarding the income factor, the high-income supports that consuming sustainably might be more difficult in poorer communities, revealing the need for local authorities to intervene and facilitate the accessibility of sustainable products in these areas. To address this, policymakers can develop targeted interventions

such as subsidies or vouchers for sustainable goods in low-income communities, similar to the UK's Healthy Start vouchers program which helps low-income families access nutritious foods. Moreover, local governments can support community-based green markets and cooperatives, as seen in cities like San Francisco and Copenhagen, which increase access to affordable, sustainable products. These policies help ensure sustainable consumption is inclusive and equitable.

5.4. Limitations and future research directions

This study is not without limitations. First, it is important to notice that only 41 papers were used in the analysis. Although the exclusion of papers has to do with the mandatory quantitative nature of the studies, we acknowledge that insights from qualitative works could also be relevant. Nevertheless, the quantifiable advantage of the chosen method makes us confident in the achieved results. Additionally, there is a limitation in the merging process since some papers did not present the full description or items of the constructs. For example, the measurement of key constructs like knowledge and attitude varies widely across studies, indicating a need for more standardized and validated instruments. Nonetheless, when possible, the paper's context was also analysed, for which we believe that the limitation was addressed adequately. Beyond these limitations, several research gaps present promising avenues for future work. Notably, there is a need to explore the role of cultural and regional differences more deeply. The majority of existing research is concentrated in specific geographic areas, which limits the generalizability of findings. Future studies should investigate how cultural contexts and country-specific factors influence sustainable consumption behaviors. Another critical gap is the lack of longitudinal studies that examine how sustainable consumption evolves over time. Most current research relies on cross-sectional designs, which provide limited insight into behavioral persistence, habit formation, and changes in motivation. Long-term studies would greatly enhance understanding of these dynamics. Additionally, the post-purchase outcomes of sustainable product choices—such as consumer satisfaction, loyalty, and advocacy—remain underexplored. Investigating these factors can offer valuable information for businesses and policymakers aiming to encourage sustained sustainable consumption.

6. Conclusions

The consumers' choice of sustainable products has been investigated over decades and has been seen as a way for individuals to prevent or decrease environmental problems. Nevertheless, the consumers' adoption of sustainable products is still behind the expected, leading to the relevant question of which factors motivate this choice. Given this, the current study applied a meta and weight analysis using 44 studies. From these, 18 relationships were examined, as they appeared three or more times. Using the meta-analysis, results revealed 12 statistically significant predictors of sustainable products consumption. Resorting to the weight analysis, six of these variables were found to be as best predictors. Based on both analyses, this study presents a comprehensive and consolidated view of the main factors affecting consumers' sustainable choices, not only portraying the state of the art on the field but also supporting future research on the topic. This work also contributes to the practitioners' side, helping them in the better development of strategies that can both meet consumers' needs and sustainable consumption goals.

CRediT authorship contribution statement

Catarina Neves: Writing – original draft, Visualization, Resources, Methodology, Investigation, Conceptualization. **Tiago Oliveira:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization. **Fernando Santini:** Writing – review & editing, Validation, Software, Formal analysis, Conceptualization.

Declaration of competing interest

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

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Appendix A. Variables codification

Original construct	Final construct
access	access
age	age
altruism, altruistic values	altruism
attitude, attitude towards sustainable food products, green purchase attitude, hedonic attitude, utilitarian attitude, behavior intention to use green products	attitude
availability	availability
belief, beliefs	beliefs
benefits	benefits
commitment to nature	commitment to nature
conditional value	conditional value
confidence	confidence
connectedness to nature, man-nature orientation	connectedness to nature
conservation	conservation
consumer innovativeness	consumer innovativeness
education	education
egoistic values	egoistic values
environmental concern, environment consciousness, environmental awareness, environmental concern, environmental responsibility, environmental sensitivity, perception of consequence	environment consciousness
eco-friendliness, environmental attitude, environmental behavior, environmental beliefs, environmental efficacy, environmental impact, environmental protection, pro-environmental self-identity	environmental behavior
environmental impact of conventional food	environmental impact of conventional food
environmental impact of organic food	environmental impact of organic food
environmental organizations	environmental organizations
epistemic value	epistemic value
evaluation of labels	evaluation of labels
explicit evaluation	explicit evaluation
face consciousness	face consciousness
food disgust sensitivity	food disgust sensitivity
frequency	frequency
freshness	freshness
gender	gender
green consumer	green consumer
green perceived value	green perceived value
green satisfaction	green satisfaction
behavior intention to use green products, eco-labelled seafoods choice, green products consumption, green products consumption intention, green purchase intention, green purchasing, intention to by eco-certified wood, intention to by organic fish, intention to by organic food, intention to by traceable sustainable seafood, intention to organic consumerism, intention to purchase sustainable agriculture products, intention to purchase sustainably produced foods, organic food choice, organic food purchase, organic food purchase intention, purchase of sustainable agriculture vegetables, purchase intention of certified sustainable wood products, purchase intention of green food, purchase intention of green products, purchase intention of organic food, purchase of organic food, purchase on sustainable and organic food, purchase sustainable food, sustainable consumption behavior, sustainable food choices, sustainable food consumption, sustainable purchase behavior, sustainable seafood consumption, willingness to pay for sustainable and organic foods	green/sustainable products consumption
guilt	guilt
health consciousness, health motives	health consciousness
hedonic attitude	hedonic attitude
higher secondary school	higher secondary school
hunger	hunger
income	income
information, information demand	information
intermediate secondary school	intermediate secondary school
internal locus control	internal locus control
intimacy with nature	intimacy with nature
justification environmental impact awareness, eco-literacy, knowledge, knowledge of labels	justification environmental impact knowledge
less than secondary school	less than secondary school
life satisfaction	life satisfaction
marketplace influence, perceived marketplace influence	marketplace influence
natural content	natural content
no genetic modified organism	no genetic modified organism
no hormones	no hormones
organic food values	organic food values

(continued on next page)

(continued)

Original construct	Final construct
origin	origin
passion for nature	passion for nature
past consumption, past experience, previous experience	past experience
perceived barriers	perceived barriers
perceived behavior control	perceived behavior control
perceived consumer effectiveness	perceived consumer effectiveness
perceived self-identity	perceived self-identity
personal characteristics	personal characteristics
personal norms	personal norms
policy support	policy support
justification price, perceived price, price, price value, value for money	price
quality	quality
response efficacy	response efficacy
food safety concern, safety	safety
salary	salary
self-efficacy	self-efficacy
self-monitoring	self-monitoring
self-transcendence	self-transcendence
social consumption motivation	social consumption motivation
social impression	social impression
social value	social value
spirituality	spirituality
studying	studying
group conformity, groups norm, social norms, subjective norm, subjective norms	subjective norm
sustainable agriculture	sustainable agriculture
sustainable motives	sustainable motives
integration capability of weak signals	integration capability of weak signals
green trust, trust	trust
eco-label, organic certification, trust in certified label, trust in certified organizations	trust in certified label
trust in non-certified label	trust in non-certified label
university degree	university degree

Data availability

Data will be made available on request.

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