



The mediating role of attitudes in the effect of human and environment-centered value orientation on green cosmetic product purchasing behavior: comparison of different countries

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Received: 30 January 2024 / Accepted: 24 March 2025 / Published online: 15 April 2025
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Abstract

The growing concern for environmental issues has reached a critical level, demanding immediate attention. With the widespread integration of cosmetic products into daily routines, the escalating environmental impact cannot be ignored. Consumers are increasingly scrutinizing the environmental footprint of their purchases and the practices of manufacturing companies. To maintain their competitive edge, businesses must proactively understand and address the evolving needs and expectations of their consumers. This study aims to reveal the relationships between consumers' environmental values, attitudes toward green products, and green cosmetics purchasing behaviors to guide decision-makers in the cosmetics industry. In addition, the study also evaluated the impact of consumers' cultural backgrounds on their attitudes toward green products and their purchasing behaviors in the green cosmetics sector. We conducted a comprehensive online survey by collecting primary data from 883 respondents from 10 countries in Asia and Europe. Our analysis used partial least squares (PLS) with SMART PLS to comprehensively examine the interrelationships between variables. An ecocentric orientation positively influences attitudes and purchasing behavior toward green cosmetic products, while an anthropocentric orientation has a negative effect. Additionally, consumers' attitudes mediate the impact of environmental attitudes on purchasing behavior and counteract the negative effect of anthropocentric attitudes. Cultural differences significantly impact consumers' attitudes and purchasing behavior for green cosmetics. The study's findings offer valuable insights for cosmetic companies dealing with growing demand for cosmetic products and environmental awareness. The empirical support for existing literature is significant, and the study's structural model enriches the green cosmetics literature. It's essential to consider both consumers and producers for sustainable green cosmetic production, ensuring profitability and encouragement for producers.

Keywords Green consumer behavior · Environmental attitude · Purchasing behavior · Cultural difference · Ecocentrism · Anthropocentrism

1 Introduction

The impact of the behaviors and operations of people and organizations on the environment is the subject of many studies and is also on the agenda of international organizations. In the early years of the Industrial Revolution, targeting only production led to the disregard of all other negative effects, especially on the environment (Berry & Rondinelli, 1998). The fact that the accumulated environmental problems exceeded the environmental, social, cultural, economic, and psychological carrying capacity mobilized many international organizations, especially the United Nations (Baltacı, 2021). The report titled “Our Common Future” was put forward at the meeting held in Brundtland in 1987 with the will of the United Nations Commission on Environment and Development. The concept of “sustainability” was emphasized for the permanent solution of environmental problems (Baltacı, 2021). Afterwards, countries and businesses began to look for ways to achieve this goal. Nowadays, many solutions are proposed for sustainability. Recycling is one of them. In recent years, it is possible to see new trends in recycling. Radical solutions such as transforming biological waste and offering it for human use again (Marousek et al., 2024) can also be seen in the cosmetics sector. The use of biological waste in the cosmetics industry is a new trend in the name of “green” and “sustainable” applications (Maroušek et al., 2023). Cosmetic products cause significant amounts of carbon emissions both during production and consumption. The high chemical content of many products also increases their negative environmental impact. Not only the products themselves but also their packaging poses a risk to the environment (Scope et al., 2024; Vassallo & Refalo, 2024). Daily use of cosmetic products is increasing day by day. The continuous increase in production in the cosmetics industry shows that the level of use is also increasing. Market reports demonstrate the continuous growth in skin and sun care products, hair care products, deodorants and fragrances, make-up and colour cosmetics, and personal care products. (statista.com) Men also start using such products, which increases the negative multiplier effect on carbon emission rate and environmental pollution (Bausano et al., 2023a, b). Cosmetics, particularly those used for daily personal care (including styling gels or mousses, fragrances, cologne, essence, light essence, perfume, light perfume, lipstick, blush, compact powder, brow pencil, creams, lotions, oils, shampoos, soaps, cleansers, and even toothpaste, among others), have a wider range of uses. In addition, almost every individual uses at least one of them (Liobikienė & Bernatoniė, 2017). Cosmetics consumers are becoming more aware of the problems associated with these products and are looking for products that are more natural, green, organic, and associated with the concept of health. The cosmetics industry is also becoming more sustainable in addressing consumer concerns (Martins & Marto, 2023).

There are some studies on cosmetic products and sustainability. These studies mostly focus on the sustainability of cosmetic products (Rocca et al., 2022), carbon emissions from cosmetic consumption (Bousano et al. 2023a), cosmetic product life cycle (Bousano et al., 2023a; Glew & Lovett, 2014), and pro-environmental consumer behavior (Amberg & Fogarassy, 2019). However, consumers’ environmental orientations (ecocentric and anthropocentric) affect their green purchasing behavior (Patwary et al., 2022, 2023; Perera et al., 2022). However, the impact of cultural differences on green purchasing behavior has been proven (Liobikienė et al., 2016; Sreen et al., 2018). The analysis of all these variables within a model has been neglected. A research gap is particularly evident in the cosmetics sector.

Green cosmetic products have become an integral part of daily life, from an environmental perspective. The study, which is planned to be shaped based on cross-cultural comparison, aims to both contribute to the literature and fill the empirical study gap in the cosmetics sector. In the study, we focused on the theme of green cosmetic products rather than sustainability in the cosmetics sector. Because sustainability includes not only the theme of “green” but also economic, social, and cultural values. In addition, sustainability is not one-dimensional. It is a holistic structure that includes the entire system (products and services produced, supply chain, raw materials, distribution network, marketing channels, employees and customers, environmental factors, etc.) (Franca & Ueno, 2020). Green cosmetic products are the final product within this structure (Bom et al., 2019, 2020). Green cosmetic products can be “green” with the chemicals they contain, the waste materials (packaging, bottles, etc.) that occur after use, and the carbon emissions from the production to consumption process (Bozza et al., 2022; De et al., 2023). While the European and USFDA guidelines are legal instruments that clearly outline the appropriate manufacture and marketing of such products to create a market that is highly protective of human health, cosmetic products belonging to green categories are subject to current legislation. It does not have standardized definitions. In the cosmetic industry, they are classified according to their functional components and excipients. In general, a compound found in nature or extracted from a natural source and used as is without being chemically modified is called natural, whereas a compound that is chemically modified is considered naturally derived (Bozza et al., 2022). Therefore, in this study, ecological, natural/organic, vegan/vegetarian, carbon emission reduced, and certified “green cosmetic products” were discussed (COSMOS, Organic, and Natural Cosmetic Standards, 2024; NATRUE, The International Natural and Organic Cosmetic Association, 2024). The results are expected to help companies operating in the cosmetics sector shape their future marketing strategies. The study was created with an inductive perspective (Ara-biun et al., 2023). First of all, the basic dynamics of the cosmetics sector and the economic market size were examined. Then, the subject of environmental orientation was addressed within the ecocentric and anthropocentric framework. Finally, green consumer behavior in the cosmetics market was examined. Thus, the hypotheses of the research were formed. The study included citizens from 10 countries in Asia and Europe, considering cultural diversity. This is crucial as environmental psychology research has shown that human-environment interactions profoundly impact (Russell & Ward, 1982). “Wherever we go, we are there. Because we are always embedded somewhere. We are nested in a community, a nation, a street, or a geography. Therefore, it is not possible to free our behavior from these factors” (Gifford, 2014). The influence of cultural roles is often disregarded in studies of environmental psychology. We are constantly intertwined within layers of both place and culture. Thus, the cultural context significantly shapes the physical reality of places. Neglecting the critical role of culture in studying human-environment interactions risks an incomplete understanding of these dynamics (Tam & Milfont, 2020). In empirical research, primary data were primarily analyzed for reliability and validity. Convergent and discriminant validities were tested using Composite Reliability (CR), Average Variance Extracted (AVE), and Root Average Variance Extracted ($\sqrt{\text{AVE}}$). Structural validities were tested with confirmatory factor analysis (CFA). Multiple relationships between variables were analyzed with the partial least squares technique (PLS). The study was concluded by testing the research hypotheses with the structural model.

2 Conceptual framework

In this part of the study, the theoretical background and literature review of the variables used in the research are presented. However, it aims to form hypotheses regarding the structural model tested in the study.

2.1 Cosmetics industry

Essential oils in the cosmetics industry include fragrance mixtures used as raw materials in the industry; for perfumes; for skin care, beauty, and make-up products; and for goods that meet the Customs Tariff Statistics Position (GTIP) related to hair, oral, and dental health; shaving and toilet preparations; soaps; and body deodorants (Yücesan, 2020). The cosmetics sector is a sector with a high rate of chemical substance use (Mishra, 2018). As such, cosmetic products have a great impact on global warming and ozone layer damage (Yalçın & Yalçın, 2017). Therefore, climate change is also a direct trigger of climate change (Bom et al., 2020; Javan et al., 2023). However, the rate of individual use of cosmetic products is also quite high (Safford et al., 2015). Cosmetic products, which have become an indispensable part of the modern lifestyle of individuals, are preferred not only by women but also increasingly by men for their daily routines. Changing lifestyles lead to the continuous growth of the global cosmetic market. This growth has caused the environmental impact and carbon footprint to increase continuously (Francke & Castro, 2013).

The sector, which currently has an economic volume of 380.2 billion dollars, is estimated to exceed 460 billion dollars in 2027. This increase will trigger the growth of environmental problems. Cosmetic manufacturers make the necessary investments to prevent environmental problems and produce products with green product labels. However, consumers do not exhibit sufficient purchasing behavior (Lin et al., 2018). The reasons why consumers do not exhibit the desired behavior in purchasing are a subject that needs to be investigated.

2.2 Ecocentric and anthropocentric environmental attachment

Two basic approaches determine the attitudes of individuals toward the environment and can be considered based on sustainability. Studies conducted on these two dimensions involve anthropocentric and nonanthropocentric approaches. The most accepted approach among nonhuman-centered approaches is the eco-centric approach (Roney, 2011). Both approaches focus on the relationship between man and the environment. However, there are sharp lines between them.

2.2.1 Anthropocentric approach (human centrism)

The anthropocentric approach takes a philosophy based on utilitarianism as a reference. The smooth functioning of all systems and the support of all entrepreneurs who will provide this support are among the main objectives of the human-centred approach. For advocates of the anthropocentric approach, the environment and the factors that constitute the environment are important. The continuation of human life is directly proportional to environmental quality (Baltacı, 2021). As can be understood from here, the advocates of the approach do not focus on environmental values but on the continuation of human life. That is, every-

thing necessary for the continuation of human existence is valuable. In other words, existing things are as valuable as their benefits to humans (Roney, 2011). Owing to the human mind and power of thought, people have the will and ability to stop environmental degradation at any time. Therefore, he can use whatever resource he wants as much as he wants. While doing this, there is no need to plan for the future. Future generations have not yet arrived. Therefore, it is of no use to today's people. From this point of view, people do not have the moral responsibility to think about future generations (Fromm, 2003).

The concept places everything and every system around people by referencing the human mind and positioning everything that exists according to its benefits to humans. As such, it does not present an adequate approach to the future of the environment or the transfer of a healthy environment to future generations. When evaluated within the scope of the study, individuals whose environmental orientations are shaped within the framework of the anthropocentric approach are expected to prioritize individual interests in their consumption behaviors. If consumers with an anthropocentric orientation consider green products as beneficial for themselves, they may consume them even if they harm the environment because what is valuable to them is people (Patwary et al., 2023). Therefore, this study proposes the following hypothesis:

H1a: An ecocentric attitude toward the environment positively affects one's attitude toward green cosmetic products.

H1b: An anthropocentric attitude toward the environment negatively affects one's attitude toward green cosmetic products.

2.2.2 Ecocentric approach (environmentalism)

The contradiction of the values that the anthropocentric approach is based on and defended concerning the philosophy of sustainability has led to many criticisms. Environmental values and critical deficiencies to leave a liveable environment for future generations have triggered the search for new approaches (Baltaci, 2021). Thus, the foundation of the ecocentric approach was laid (Dunlap & Catton, 1979). Proponents of the new approach argue that humans are seriously destroying nature and that the world's carrying capacity limit is rapidly approaching. They attach great importance to the protection of the environment. While asking for this, they refer to the environment and all systems that make up the environment to be at least as valuable as humans (Shrader-Frechette, 1996).

In terms of the values they defend, individuals who defend values on a similar basis to the philosophy of sustainability act with the responsibility of leaving a liveable environment to future generations (Baltaci, 2021). For this reason, ecocentric consumers are expected to shape their purchasing behavior based on environmental sustainability. Eco-centric consumers may consume green products if they consider them beneficial for themselves and the environment. Because what is valuable to them is the flora and fauna of the environment. They also think that all systems should cooperate in harmony (Patwary et al., 2023). Therefore, this study proposes the following hypothesis:

H2a: An ecocentric attitude toward the environment positively affects green cosmetic product purchasing behavior.

H2b: An ecocentric attitude toward the environment positively affects green cosmetic product purchasing behavior.

2.3 Green consumer behavior in cosmetics

Studies have been conducted to determine green consumer behavior and the predictive factors of this behavior in the cosmetics sector. Within the framework of planned action theory, Askadilla and Krisjanti (2017) discussed green consumer behavior in the cosmetics industry. As a result of the present study, green purchase intention is affected simultaneously by attitude, subjective norms, and perceived behavioral control, which are subdimensions of planned action theory, and both green purchase intention and perceived behavioral control show a significant relationship with green behavior. It has been determined that there is a mediating effect between perceived behavioral control and behavior. In another study, the purchasing behaviors of French and American consumers were discussed from a cultural perspective. According to this, it has been found that psychological factors and social events are effective at directing purchasing behavior and that cultural differences are effective at influencing the cosmetic product preferences of French and American consumers (Weber & Villebonne, 2002).

A study conducted in Pakistan aimed to identify the driving factors of green consumer behavior. Research has shown that the promotion of famous people who are at the forefront of society, promotional activities, product packaging, and brand image have direct effects on green consumer behavior (Qalati et al., 2020). Other factors that play a role in consumers' choice of green cosmetic products include health and environmental awareness. In addition, the use of an environmentally friendly packaging system also affects the purchasing behavior of consumers (Amberg & Fogarassy, 2019). In another study, which aimed to reveal the motivational sources of green consumer behavior through cross-cultural comparison, significant similarities and differences were identified between Asia (Bangladesh) and Europe (United Kingdom). Accordingly, cultural differences directly affect green purchasing behavior (Pervin et al., 2014). In this study, the reasons for the increase in demand for green cosmetic products were investigated. Despite the lack of knowledge and awareness, especially in developing countries, it was shown that the triggers of this increase were brand awareness, brand loyalty, and perceived quality (Al-Haddad et al., 2020).

Other factors that encourage consumers to buy green cosmetic products include ecological motivation, environmental information, campaigns, advertisements, and public relations activities. There is a strong relationship between subjective norms, one of the subdimensions of planned action theory, and green cosmetic product purchasing behavior (Shimul et al., 2022). It is important to categorize products according to consumers' green product purchasing behavior. Emphasizing the brand and quality, emphasizing the health theme, and choosing the green colour in packaging are among the important factors that guide purchasing behavior (Liobikienė & Bernatoniene, 2017). The personality traits and lifestyles of consumers and prioritizing health and environmental sensitivity are among the important factors that encourage green buying behavior (Graciano et al., 2021). Environmental awareness, environmental attitude, perceived consumer activity, and epistemic and functional value in consumption values have positive relationships with green makeup purchase intentions. However, the social value of consumption tendencies has a negative relationship with green makeup purchase intentions. The culture to which they belong has a significant impact on the green product purchasing behavior of consumers (Ma et al., 2018). Environmental awareness, product features, and brand knowledge have significant impacts on consumers' green cosmetic product purchasing behavior. There is a significant relationship

between brand knowledge and perceived quality. In addition, perceived quality mediates the relationship between brand knowledge and purchasing behavior. For this reason, brand knowledge should be considered a factor confirming a key role in directing consumers to green cosmetic products (Yang, 2017). The green purchasing behavior of consumers is also significantly affected by altruistic values and hedonic values. Both values govern both environmental beliefs and personal norms. Personal norms determine whether green buying behavior occurs. However, electronic word of mouth (eWOM) is another important element that drives consumers' green purchasing intentions (Jaini et al., 2020b). Consumers' trust and acceptance level are also important for them to achieve the intention to use innovation (Jain et al., 2024). The direct and indirect effect of emotional intelligence on consumer decision-making is mediated by the level of cognition (Joshi & Brahmī, 2023). Because human capital and behavior affect the success or failure of an enterprise (Salamzadeh et al., 2023). It has been reported that personal benefit is also effective in consumer behavior (Shaikh et al., 2023). In this context, it can be said that the green cognitive level is effective in this process. Accordingly, this study proposes the following hypotheses:

H3a: Attitude toward green products positively affects green cosmetic product purchasing behavior.

H3b: Attitude toward green products mediates the effect of anthropocentric and ecocentric value orientation on green cosmetic product purchasing behavior.

Culture is one of the main factors that shape human behavior. This situation also shows itself in purchasing behavior. Because of each society's level of development, per capita income (Wijekoon & Sabri, 2021), social media usage habits (Sun et al., 2022), environmental awareness level (Palmer et al., 1998; Szagun & Pavlov, 1995), and environmental behavior patterns (Chwialkowska et al., 2020), the level of development differs. To understand the green purchasing intentions and behaviors of individuals, the importance of national cultures should be known and considered in such studies (Peña-García et al., 2020). In addition, the number of empirical studies examining the effects of culture on consumers' green purchasing behavior is insufficient (Wijekoon & Sabri, 2021). This situation has attracted the attention of researchers, and the following hypotheses were included in the study:

H4a: Cultural differences (CLDs) affect attitudes toward green products.

H4b: Cultural differences (CLDs) affect green cosmetic product purchasing behavior.

3 Methodology

3.1 Research universe and measurement tools

The data needed for this study will be collected through questionnaire forms. The questionnaire to be used in the study was composed of 4 parts. In the first part, there are statements to determine the demographic characteristics of the participants. In the second part, a new environmental paradigm scale is used to measure environmental attitudes. The scale consists of 10 items measuring two ecocentric and anthropocentric characters. The validity and reliability of the scale were tested by Baltacı (2021), who applied it in Turkish. In the third section, the green consumer purchasing behavior scale is used. The items used for the measurements were obtained from the study by Waqas et al. (2020). The consumers' attitudes toward green products were adapted and implemented from the study by Soyeز (2012). In

addition to the questions used to determine demographic profiles, the scale items used a 5-point Likert scale.

The research data collection process was carried out in Alanya/ANTALYA. Alanya is one of the most preferred touristic destinations for different nations, where residences are bought or rented for holiday purposes. As of 2021, 44,896 citizens from 126 different countries have obtained residence permits at their destination. Of the international homeowners, 22% are Russian, 16% are Iranian, 15% are German, 15% are Ukrainian, 14% are Dutch and 11% are Norwegian. The remaining 7% are citizens of other countries. (ALTSO, 2021). The number of residences belonging to these people is more than 50,000. The cosmopolitan nature of the destination facilitates the process of providing the multiculturalism needed in research and collecting data from more than one culture. In this context, the data collection process was carried out through foreign associations operating in Alanya and through the foreign council operating within the Alanya Municipality. Each country group was included in the sample according to their proportion of the total population, thus ensuring that each culture was represented equally and homogeneously. Participants were asked whether the country they were born in was the same as the country they grew up in. The potential power of a no response was held constant to eliminate the manipulative effect of participants' prior history. Each of the participants is from a different nationality. This situation indicates a heterogeneous structure. For this reason, the participants' nationalities, which are representative of their cultures, were used as a control variable. In addition, the nationalities included in the study group refer to and include all 6 cultural dimensions of Hofstede (2011). Stereotypes representing social labels can be perceived as a kind of threat. Therefore, in order to avoid any negative reactions from the participants, the survey form questions were asked based on self-identity and were free from social identity (Henderson & Rank-Christman, 2016). The data collection tool, organized in English, German, or Russian, was transferred to the online environment via Google Forms and delivered to potential participants. As a result of the data collection process carried out between 06 June and 07 August 2022, 883 questionnaires were returned.

AMOS and LISREL are covariance-based SEM techniques. Therefore, they require homogeneous distribution. They produce reliable results in models with high familiarity. They estimate parameters by reproducing a covariance matrix as close as possible to the observed covariance matrix. Covariance-based SEM technique assumes a parametric model where the data distribution must require a multivariate normal distribution. Covariance-based techniques may lose estimation accuracy due to the factor uncertainty problem and can have only reflective relationships. PLS is a component-based SEM technique because it estimates parameters similar to the principal component with a multiple regression approach. A component-based SEM technique can have both formative and reflective external relationships. The PLS algorithm iteratively generates estimates of latent variables (LV) scores based on internal and other relationships. That is, each estimated LV score is determined based on internal and external relationships until the two relationships converge. Familiarity with PLS is relatively low (Hsu et al., 2006). In the structural model of the study, the cultural variable is not metric but categorical. In other words, it is possible that it will not show a homogeneous distribution. In addition, in this study, we focused on multiple relationships between variables beyond verifying the main variables. Therefore, we completed our analyses through PLS.

3.2 Demographic profile of participants

The ratios of female to male participants in the research sample were similar. The vast majority of my participants were aged 42 years and older. Married participants are dominant in the sample. Half of the participants had an income of 3001\$ or more. While Russian nationals are in first place in the sample, Iranian participants are in second place, and German participants are in third place. The majority of the participants were working (Table 1).

4 Results

To test the research hypotheses, the authors employed the partial least squares-structural equation modelling (PLS-SEM) approach, recognized as an effective method for estimating moderating effects. A two-step procedure was utilized in this study to assess the PLS outcomes: evaluating the measurement (outer) model and the structural (inner) model (Hair et al., 2012). The mediating role was analyzed using the “product indicator approach,” which is provided as a default option in SmartPLS. This method is appropriate when both the mediator and independent constructs are reflective, as was the case in this research (Martínez García de Leaniz et al., 2018).

4.1 Evaluation of the measurement model

The results from the measurement model evaluation affirmed the validity and reliability of the measurement scales used in the study (Table 2). Both Cronbach’s alpha (α) and composite reliability (CR) coefficients exceeded the threshold of 0.70, demonstrating the reliability of the scales (Hair et al., 2012). Additionally, the AVE (average variance extracted) values for all constructs were above 0.50, with all item loadings either surpassing or being

Table 1 Demographic profile

Gender	<i>n</i>	%	Marital Status	<i>n</i>	%
Male	481	54,5	Married	597	67,6
Female	402	45,5	Single	286	32,4
Age	<i>n</i>	%	Monthly Income	<i>n</i>	%
15–23	84	9,5	less than \$1000	76	8,6
24–29	198	22,4	1001–2000\$	166	18,8
30–35	163	18,5	2001–3000\$	204	23,1
36–41	154	17,4	3001–4000\$	267	30,2
42 and above	284	32,2	4001\$ and above	170	19,3
Educational Status	<i>n</i>	%	Country	<i>n</i>	%
Primary education	164	18,6	Russia	192	21,7
High school	308	34,9	Iranian	137	15,5
License	227	25,7	Germany	135	15,3
graduate	184	20,8	Ukraine	124	14,1
Working condition	<i>n</i>	%	Holland	122	13,8
Retired	219	24,8	Norway	101	11,4
Worker	664	75,2	Other	72	8,2

Source: Data survey

Table 2 Measurement model

Construct	Items	Weights	α	CR	AVE	$\sqrt{AVE}$
Ecocentric (ECO)	EC1	0.79	0.88	0.80	0.63	0.79
	EC2	0.82				
	EC3	0.90				
	EC4	0.68				
	EC5	0.76				
Antropocentric (ANT)	AN1	0.88	0.92	0.81	0.74	0.86
	AN2	0.71				
	AN3	0.92				
	AN4	0.94				
	AN5	0.83				
Green Cosmetic Product Purchasing Behavior (GCPB)	GC1	0.88	0.84	0.78	0.75	0.87
	GC2	0.93				
	GC3	0.90				
	GC4	0.75				
Attitude to Green Product (AGP)	GP1	0.89	0.94	0.71	0.85	0.92
	GP2	0.95				

Source: Data survey

Table 3 Outcomes for Fornell and Larker's criterion regarding discriminant validity

	ECO	ANT	GCPB	AGP
ECO	0.790*			
ANT	-0.674	0.860*		
GCPB	0.721	-0.228	0.870*	
AGP	0.738	-0.256	0.659	0.920*

*Square root of the variance shared by the constructs. Off-diagonal elements are correlations between constructs

Source: Data survey

Table 4 Findings from the examination of the heterotrait–monotrait ratio (HT-MT)

	ECO	ANT	GCPB	AGP
ECO	1			
ANT	0.247	1		
GCPB	0.526	0.264	1	
AGP	0.631	0.309	0.698	1

Source: Data survey

very close to 0.70, and statistically significant at the 0.001 level. These findings confirm the scales' convergent validity (Baltacı, 2021; Martínez García de Leaniz et al., 2018).

This study follows three approaches to measure the discriminant validity of measurement scales (Tables 3 and 4). The diagonal loads of an element's external load on the associated structure are greater than any load on other structures. The square root of each AVE coefficient ($\sqrt{AVE}$) is greater than the correlations between structures. Thus, all the factors meet the criterion proposed by Fornell and Larcker (1981). Finally, in all the cases, the heterotrait–monotrait (HT-MT) values were less than the 0.85 threshold of 0.90 (Table 4). Values greater than 0.90 of this ratio indicate that there is no discriminant validity. By bootstrapping, it was concluded that all values were significantly different and far from 1 (Valverde-

Roda et al., 2022). These results confirm the discriminant validity of the measurement scales used in empirical research (Roemer et al., 2021).

4.2 Structural model assessment

The structural model designed to test the hypotheses in this study was analyzed through three key steps: (1) examining the coefficient of determination (R^2) for latent constructs, (2) evaluating predictive relevance (Q^2) via the blindfolding technique, and (3) bootstrapping the path coefficients and effect sizes of the structural model (Campus & Adyar, 2018). A resampling bootstrapping technique with 5000 iterations was employed, ensuring each sample contained the same number of observations as the original dataset. This method was used to derive standard errors and t-values for the path analyses (Naess & Clausen, 2001; Hair et al., 2012). The relationships among the latent variables in the structural model were assessed based on the magnitude and direction of the path coefficients. A summary of the structural model results is presented in Fig. 1.

The R^2 values exceeded 0.40 across all paths, indicating that the theoretical model sufficiently accounts for the variance in the dependent variables, as per Chin's (1998) suggested benchmarks. Additionally, the blindfolding procedure revealed that all Q^2 values were significantly greater than zero, supporting the predictive relevance of the model to the dependent variables.

The structural equation model was defined using the following formula:

$$[Y_3 = \alpha_3 + \beta_{31}Y_1 + \beta_{32}Y_2 + \gamma_{31}X_1 + \gamma_{32}X_2 + e_3]$$

In the structural model formula, α (alpha) is the intercept term associated with each endogenous variable (Y_i), β_{ii} (beta) is the path or structural coefficient in the regression of endogenous (Y_i) on other endogenous (Y_i) variables, γ_{ij} (gamma) is the structural coefficient in the regression of endogenous (Y_i) on exogenous (X_j) variables, "e" is the error term associated with an endogenous variable, Y_i and j are subscripts denoting endogenous and exogenous variables, respectively (Mueller, 1996).

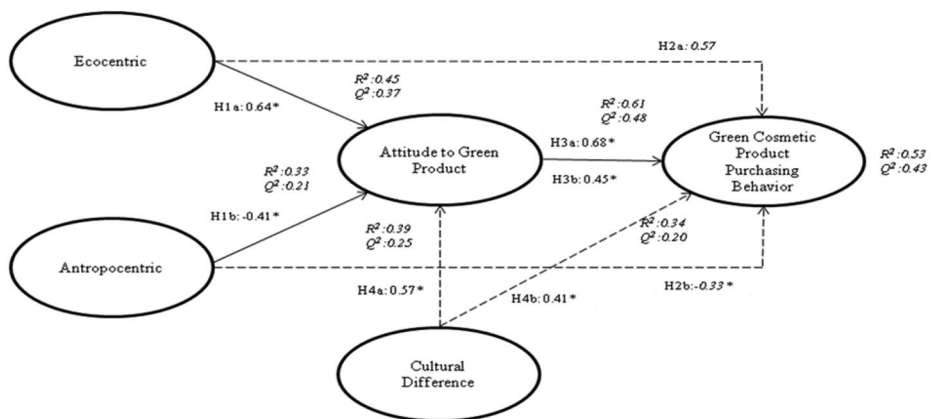


Fig. 1 Structural model

Table 5 Significance testing results of the structural model path coefficients

Structural Path		Path Coefficient	Effect size (f^2)	<i>t</i> Value
H1a: ECO	→	AGP	0.64*	25.432
H1b: ANT	→	AGP	-0.41*	11.724
H2a: ECO	→	GCPB	0.57*	18.658
H2b: ANT	→	GCPB	-0.33*	4.110
H3a: AGP	→	GCPB	0.68*	27.698
H3b: Moderating Effect	→	GCPB	0.45*	14.770
H4a: CLD	→	AGP	0.57*	12.652
H4b: CLD	→	GCPB	0.51*	13.230
* $p \leq 0.01$				
Source: Data survey				

Finally, the bootstrapping approach (two-tailed test) was used to determine the significance of structural model route coefficients and effect size. Table 5 summarizes the results for direct and moderator effects, including path coefficients, effect sizes (f^2), *t*-values, and significance levels. Thus, the empirical evidence collected in this study supports all of the research hypotheses stated in our theoretical model. Cohen's f^2 for important pathways in the interior model was higher than 0.02. These findings point to satisfying effects for endogenous latent structures (Purwanto & Sudargini, 2021). However, cultural differences were acquired as a control variable, strengthening the link between the variables (R^2 : 0.71; $p \leq 0.05$).

The results of this research affirm that consumers with an ecocentric orientation have a significant and positive influence on their attitudes toward environmentally friendly products (hypothesis H1a) and their purchasing decisions for green cosmetics (hypothesis H2a). Conversely, an anthropocentric worldview negatively impacts consumers' perceptions of green products (hypothesis H1b) and their inclination to purchase green cosmetics (hypothesis H2b). Additionally, a positive relationship was observed between consumers' attitudes toward green products and their purchasing behavior for these products (hypothesis H3a). These attitudes also serve as significant moderators, enhancing the influence of environmental attitudes (ecocentric and anthropocentric) on the purchasing behavior of green cosmetic products (hypothesis H3b). Moreover, the findings demonstrate that cultural variations significantly shape attitudes toward green products (hypothesis H4a) and influence purchasing behavior concerning green cosmetic items (hypothesis H4b). For instance, individuals with anthropocentric views tend to be less environmentally concerned (Altun, 2020). Consequently, such individuals are less likely to prioritize environmental preservation or engage in eco-friendly behaviors (Baltacı, 2021).

The negative correlations found for H1b and H2b align with prior research findings in the field. Consumers with favourable perceptions of green products are notably more inclined to purchase these items. The research emphasizes that ecocentric thinking not only enhances consumer attitudes toward green products but also positively influences their buying behavior. In contrast, anthropocentric perspectives hinder this process by focusing more on product benefits than environmental impacts. Therefore, cultural background emerges as a critical determinant of consumer attitudes and behaviors toward green products.

The study underscores that ecocentric attitudes are vital for fostering both favourable perceptions and purchasing behaviors related to green products. It supports the notion that consumers with heightened environmental awareness are more receptive to environmentally friendly products. Conversely, anthropocentric consumers place lower importance on eco-

centric behavior, suggesting the need for alternative marketing strategies to appeal to this group. This indicates that marketing strategies should consider cultural and environmental orientations, emphasizing the utility of green products to engage anthropocentric consumers effectively.

5 Discussion

5.1 Theoretical implications

This research addresses the gap between environmental attitudes and behavioral intentions regarding green cosmetic purchases. It provides a comprehensive understanding of how consumer perceptions align with cultural elements in adopting eco-friendly cosmetics. This study enriches the literature on sustainable consumer behavior, particularly in the cosmetics sector, by integrating perspectives from environmental psychology and consumer behavior. This study integrates internalized perceptions with perceptions of green cosmetic products (Chhetri et al., 2021) to develop a model that explains pro-environmental responses to the cosmetics industry holistically.

By examining consumer attitudes toward green cosmetic products through the lens of environmental attitudes (ecocentric and anthropocentric), this research develops a framework for understanding pro-environmental responses in the cosmetics industry. The findings align with prior studies exploring consumer behavior toward environmentally friendly products and services (Jaini et al., 2020b; Quoquab et al., 2020). However, this work advances existing knowledge by incorporating mediating variables and cultural influences (Amberg & Fogarassy, 2019; Liobikienė & Bernatoniene, 2017; Ma et al., 2018; Mishra, 2018; Shimul et al., 2022).

This paper adds new theoretical contributions to the academic literature. No previous studies have looked into the relationship between customers' environmental beliefs, attitudes toward green products, and behavioral intentions in the cosmetics business. Previous research in the cosmetics industry literature has examined green consumer behavior (Amberg & Fogarassy, 2019; Askadilla & Krisjanti, 2017; Jaini et al., 2020a), intention to purchase green cosmetic products (Chhetri et al., 2021; Mishra, 2018), and customer value (Graciano et al., 2021). The link between green consumer behaviour and brand image (Qalati et al., 2020), and the impact of cultural variations on purchase intentions (Quoquab et al., 2020).

Our research distinguishes itself from previous empirical studies by considering environmental attitudes in an ecocentric and anthropocentric framework, examining the relationship between environmental attitudes, attitudes toward green products, and intentions to purchase green cosmetic products within a model, and considering cultural differences. The results of this paper confirmed the established relationships in environmental psychology. Furthermore, it empirically proved that cultural differences should be taken into account in the effects of ecocentric and anthropocentric environmental orientation on attitudes and behaviors. Accordingly, the nationality variable, one of the social stereotypes, also shapes environmental orientation. Although there are some studies examining the impact of cultural factors on green purchasing behavior, they have not gone beyond local, and therefore their global representativeness has remained weak. Liobikienė et al. (2016) focused

on European Union member countries and limited their focus to the regional scale when examining green purchasing behavior on a cross-cultural scale. Chan and Lau (2002) made a cross-cultural comparison to explain green purchasing behavior. They focused on only two cultures by comparing the cities of Los Angeles and Shanghai. Nguyen et al. (2017) investigated the influence of cultural values on green purchasing behavior based on collectivism and long-term orientation. They only surveyed Vietnamese citizens, thus failing to provide globally scalable insights.

The findings demonstrate that consumers' environmental attitudes significantly influence their perceptions of green products, which, in turn, drive purchasing behavior. While ecocentric perspectives positively impact attitudes and behaviors, anthropocentric values have the opposite effect. This insight could prompt green cosmetic companies to revisit their marketing strategies, emphasizing utilitarian benefits for anthropocentric consumers to encourage engagement (Yoon & Kim, 2016). Additionally, the study confirms a relationship between income levels and willingness to purchase green products, consistent with prior research (Akhtar et al., 2021; Srisathan et al., 2023; Witek & Kuźniar, 2020). Middle- and high-income consumers are more likely to consider environmental and ethical values in their purchasing decisions. The study found that environmentally sensitive consumers, often belonging to these income groups, are more inclined to purchase green products, thereby reinforcing existing literature. This suggests a significant market opportunity for green cosmetics targeted at ecocentric consumers, while strategies focusing on the functional aspects of green products may better engage anthropocentric consumers.

This study emphasizes that consumers' perceptions of green products, coupled with ecocentric attitudes, serve as significant drivers in their decision to purchase environmentally friendly cosmetic products. In contrast, anthropocentric attitudes negatively influence environmental perceptions and purchasing behaviors for green cosmetics. Ecocentric consumers prioritize environmental concerns, which strongly motivates their purchasing decisions for eco-friendly products (Bisschoff & Liebenberg, 2016). However, prioritizing utility can sometimes dilute the perceptions of green products among these consumers (Purser et al., 1995), suggesting that ecocentric buyers value the inherent environmental benefits of green cosmetics.

One key theoretical contribution of this research lies in incorporating environmental attitudes (ecocentric and anthropocentric) as direct and moderating predictors of the relationship between attitudes toward green products and purchasing behavior. The findings reveal that consumers' environmental attitudes directly predict green cosmetic purchasing behavior, with an ecocentric orientation naturally fostering a propensity for green product purchases. This supports prior studies showing that variations in consumers' environmental attitudes influence their green buying behavior (Patwary et al., 2022; Rahman & Reynolds, 2019). Furthermore, the research demonstrates that attitudes toward green products mediate the relationship between environmental attitudes and purchasing behavior, transforming the negative impact of anthropocentric attitudes into a positive one. This suggests that while anthropocentric consumers are less inclined to prioritize environmental concerns, they may still be influenced by the utilitarian benefits of green products.

Cultural factors also play a significant role in shaping consumer attitudes toward green products and their purchasing behaviors. Variations in cultural norms, levels of development, and the quality of education in different countries have profound effects on consumer consciousness and behavior (Chan & Lau, 2002; Liobikienė et al., 2016). These cultural

distinctions, when integrated into models exploring green purchasing behaviors, add depth to the academic literature by expanding its scope (Bacsi, 2020; Palmer et al., 1998; Szagun & Pavlov, 1995).

5.2 Managerial implications

The findings of this study carry vital implications for the cosmetics industry and the broader market for green products. Ecocentric attitudes stand out as critical drivers of positive consumer responses toward green cosmetics. Thus, businesses in the cosmetics sector should focus on developing strategies that highlight the environmental benefits of green products while enhancing their overall green image.

Incorporating green production processes as part of a company's broader strategy—alongside traditional elements such as pricing, service quality, and infrastructure—can be highly advantageous. For instance, obtaining ecological certifications can help businesses appeal to environmentally conscious consumers and stimulate their purchasing behavior. Certifications like LEED (Leadership in Energy and Environmental Design) by the U.S. Green Building Council, ISO 14,001, and the ECO-Management and Audit Scheme allow cosmetics companies to enhance their environmental performance and credibility (Hia et al., 2023; Kang et al., 2012). Promoting these certifications alongside carbon emission reductions can positively shape consumer attitudes, which is crucial for fostering green product purchases.

However, for consumers with an anthropocentric orientation, such strategies alone may be insufficient. Anthropocentric consumers tend to prioritize product utility over environmental benefits (Baltacı, 2021) and make purchasing decisions based on this perspective (Patwary et al., 2022; Xie et al., 2017). To appeal to this group, companies should emphasize how green products contribute directly to human health and well-being. Highlighting benefits like reduced carbon footprints, lower water and energy consumption, and recyclable materials can demonstrate the tangible utility of green cosmetics, attracting anthropocentric consumers.

By leveraging certifications and adopting a green brand image, cosmetics companies can build stronger relationships with environmentally conscious consumers while achieving competitive advantages (Lavuri et al., 2022; Zameer et al., 2020). Furthermore, emphasizing the dual benefits of green products' environmental impact for ecocentric consumers and utilitarian value for anthropocentric consumers can broaden market appeal.

Considering cultural differences, cosmetics businesses should ensure their green products are accessible to all societal segments. This can be achieved by diversifying information channels such as advertisements, public campaigns, sponsorships, and social media while designing inclusive strategies to make green products available to diverse cultural and socioeconomic groups (Strzelecka et al., 2017; Kim et al., 2023). By removing the perception that green products are exclusive to affluent or developed cultures, companies can foster widespread accessibility and contribute to the expansion of the green product market.

Additionally, aligning green production with sustainability standards enhances business performance (Subanidja et al., 2023). Leveraging AI can help optimize production, monitor consumer preferences, and ensure sustainability in green cosmetic production (Kliestik et al., 2023). Cosmetics companies should also use social media to manage corporate reputa-

tion and establish a cohesive green brand image, which can foster consumer loyalty and support sustainable growth (Dvorský et al., 2023).

Despite challenges like the financial strain caused by the COVID-19 pandemic (Valas-kova et al., 2023), the growing demand for green products offers an opportunity for cosmetics companies to enhance financial sustainability. By integrating eco-conscious practices into their operations and marketing strategies, these businesses can position themselves for long-term success.

6 Conclusion

To capture the interest of anthropocentric consumers who exhibit lower sensitivity towards environmental issues, cosmetics companies should focus on developing innovative solutions that enhance environmental awareness. It is essential to inform individuals with limited ecological awareness about the positive impact their environmentally conscious behavior can have. This understanding helps to sustain their engagement in purchasing environmentally friendly products (Martínez García de Leaniz et al., 2018). Consequently, increasing environmental awareness and reshaping attitudes toward environmental responsibility can pave the way for fostering green cosmetic purchasing behaviors. Research demonstrates that environmental awareness, ecological consciousness, and social norms positively influence consumers' environmental attitudes and contribute to their sense of well-being. Moreover, these factors significantly impact purchasing decisions (Lin & Niu, 2018). Rusyani et al. (2021) found that consumers' attitudes and behaviors towards eco-friendly products are strongly influenced by their level of environmental awareness. Similarly, Chen et al. (2024) highlighted the effectiveness of consumer education in raising ecological awareness. Studies within the cosmetics sector reveal that educating consumers about sustainability by providing them with knowledge and basic insights enhances their motivation to adopt sustainable practices, thereby facilitating the spread of sustainable innovations. Meanwhile, for consumers already demonstrating high environmental sensitivity, strategies must be devised to maintain sustainable sales and foster brand loyalty. Identifying new competitive approaches for these consumers is critical. Since green cosmetic products often come at a premium compared to conventional options, examining whether anthropocentric attitudes stem from financial limitations can provide valuable insights. This understanding can enhance the effectiveness of strategies targeting consumers with anthropocentric tendencies.

The rise in environmental awareness and sensitivity among consumers is increasingly driving demand for green products, including cosmetics (Buerke et al., 2017; Ma et al., 2018; Rusyani et al., 2021). In response to this growing awareness, cosmetics companies must adapt their production processes to align with consumer expectations. Transforming production methods to meet this demand is essential for staying competitive in the evolving market (Chen et al., 2024).

While green production offers numerous benefits, such as cost savings and reduced expenses, it also presents challenges, particularly in terms of investment and marketing costs (Pavolova et al., 2021). Hence, the notion that consumer demand alone is sufficient to drive green cosmetics production is flawed. Businesses must find ways to make green production financially viable by optimizing production costs (Zhou et al., 2013). Achieving this balance is vital to establishing a sustainable framework for green production.

The influence of cultural factors on consumer behavior is often overlooked in environmental psychology research. Incorporating cultural variables when analyzing participant responses can address this gap in the literature. This study adopts an inductive approach to examine the factors influencing consumer purchasing behavior. By proposing a structural model with validated reliability and accuracy, we aim to make a significant contribution to the literature.

7 Limitation

This research has certain limitations. Participants evaluated their attitudes and behaviors by responding to questionnaire items from their perspectives. According to environmental psychology theory, individuals may tend to respond in ways that align with socially desirable behaviors such as environmentally conscious actions to project a positive social image (Kaiser et al., 1999). This inclination toward social desirability can affect the accuracy and real-world applicability of the findings. Methods to address this issue include introducing controlled noise into the measurement tools or applying the study across culturally diverse populations to average out potential biases (Paunonen & LeBel, 2012; Vesely & Klöckner, 2020). In our study, we used both ecocentric and anthropocentric environmental orientations simultaneously, allowing participants to respond to contrasting items. Additionally, data collection from participants of various nationalities ensured cultural diversity. Nonetheless, prior research indicates that the influence of social desirability bias is generally minimal in environmental psychology studies (Vesely & Klöckner, 2020).

Primary data was used to capture the current state, with the questionnaire serving as a secondary, supportive tool. While this approach aids in hypothesis evaluation, it is insufficient to confirm or refute hypotheses definitively. Literature references were incorporated to substantiate the results and strengthen hypothesis validation. It is also important to note that the empirical results of this study are specific to the cosmetics industry and may not be directly applicable to other sectors. Future studies could collect data from multiple industries and diverse cultural contexts to generalize the findings. Moreover, this research primarily uses attitudinal intentions to predict the impact of consumers' environmental values on their purchasing decisions for green cosmetic products. While such intentions are commonly employed as indicators of attitudinal loyalty, they should not be equated with actual behavioral loyalty. Therefore, future research should prioritize measuring actual behaviors to thoroughly analyze how green attitudes influence purchasing decisions in the context of green cosmetics firms.

Furthermore, this study may not fully reflect purchasing behaviors across all segments of the cosmetics industry, such as the luxury market. Future research could explore both intrinsic and extrinsic motivational factors to improve the proposed model's explanatory capacity.

7.1 Recommendations to overcome limitations

7.1.1 Cross-industry studies

Repeating this study in other industries could validate its conclusions and highlight potential differences in consumer behavior across sectors.

7.1.2 Diverse sampling

Expanding the sample to encompass a wider demographic and geographic diversity could enhance the generalizability of the results. This might include conducting the study across multiple countries or targeting a more varied audience within a single country.

7.1.3 Longitudinal research

Conducting longitudinal studies can help understand how attitudes and behaviors evolve, providing deeper insights into the dynamics of environmental values and consumer behavior.

Acknowledgements The authors are grateful to the Editor and the anonymous reviewers for their valuable comments and suggestions, which helped improve the manuscript substantially.

Author contributions We ensure none of the material related to this manuscript has been published or is under consideration for publication elsewhere, including the internet. We have no conflicts of interest to disclose.

Funding Open access funding provided by the Scientific and Technological Research Council of Türkiye (TÜBİTAK).

This study received no funding from any institution.

Data availability Data will be made available on request.

Declarations

Ethical approval Ethical permission for the research was obtained from Hasan Kalyoncu University Scientific Research and Publication Ethics Committee and is attached.

Consent to participate Questionnaire forms were delivered online to potential participants. The “participant consent declaration” section has been added to the first page of the survey. Those who wanted to participate in this section clicked “yes” and gained access to the questions. Those who clicked “No” received a thank you text and the survey process ended.

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. The literature review and conceptual framework of the study were done by Duygu Çınar Baltacı (MBA) and Dr. Yakup Durmaz. The methodology section and analysis were done by Dr. Furkan BALTACI. The conclusion part was created with the contribution of all authors.

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