RESEARCH ARTICLE

Redefining green consumerism: a diminutive approach to market segmentation for sustainability

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Abstract
The purpose of this study is to accelerate green consumerism efforts by assisting green marketers in identifying the homogeneous and significant eco-friendly customer segments emerging in India. The study determines the antecedents driving customers to purchase green products, which can be leveraged while targeting the studied customer group and designing promotional strategies for these microgreen segments. Non-probability criterion-based sampling technique was used in collecting the data across Pan India through various online platforms like LinkedIn, Twitter, and Facebook. The exploratory factor analysis, followed by the cluster and discriminant analysis, is conducted for inferential results. The results reveal eight major factors influencing green consumer behavior, out of which green habit, green culture awareness and attitude, interpersonal influence, and green purchase intention/behavior emerged as the most significant factors. The study establishes two important clusters of green consumers, that is, "Green Dads"-generation Y males and "Green Janes"-generation Z females, with social media marketing and subjective norms as the most influential factors in discriminating between these two clusters. This research magnifies the importance of profiling customers based on demographics, psychographics, behavioral variables, and external marketing cues. The varied combinations of factors concerning ecological behavior imply the focus on micro variables by marketers, hence promulgating the projected granularity of green market segmentation and consequential consumer behavior.

Keywords Green market segmentation · Integrated analysis approach · Social media marketing · Gen Y employees · Green culture awareness · Green habit

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Introduction

Companies must sustain the requisite balance between economic development and environmental conservation as more and more consumers embrace sustainable lifestyles. Consequently, green consumerism has gained global interest with the increase in awareness and demand for eco-friendly products and environmental consciousness (Jaiswal et al. 2021). While strategizing, "green consumerism" is the preferred consumer behavior, where consumers purchase and consume products that are considered sustainable, chemical-free, cruelty-free, healthy, and environment-friendly (Wiener and Doescher 1991). Though overall green consumption has increased, the level of environmentalism is extensively different among various categories of consumers, with varying demands and attitudes towards sustainable products (Chan 1996; Jain and Kaur 2006; Jhamb et al. 2020).

In the modern-day marketing globe, the best avenue for developing marketing strategies backed by green targeting and positioning is "green market segmentation" (GMS) (Dahlstrom 2011; Ottman 2011; Jaiswal et al. 2021). Kotler (2009) had already established the significance of segmentation by postulating that customers cannot be treated the same in the actual market scenario. The disparities of the customers are the foundation for adopting "GSTP—green segmentation, targeting and positioning" for strategically leveraging sustainable or green differentiation (Straughan and Roberts 1999; Akehurst et al. 2012). Based on these propositions, researchers (Straughan and Roberts 1999; do Paço and Raposo 2009; Mostafa 2009; Awad 2011) proposed that green consumer segmentation (GCS) should be done by green marketers by segregating consumers into clusters based on their attitudinal, demographic, and behavioral traits pertaining to environmental consciousness. For profiling green consumers, demographic characterization is the first and foremost method to have gained prominence since the 1970s (Afonso et al. 2018) due to its ease of measurement and application (Jain and Kaur 2006). Consumers with different ages, incomes, gender, education, and marital status significantly exhibit different green behaviors (González et al. 2015).

Furthermore, it has been discovered that the profiles of green consumers vary across nations (Chan 1999). With intentions of strategizing better, the need for conducting segmentation studies in the Indian environment has always been highlighted (Kirmani and Khan 2016). Jain and Kaur (2006) mentioned that Indian consumers can substantially contribute to the cause of safeguarding the environment, even if a small percentage choose to shop sustainably. So, employing segmentation-based sustainable marketing strategies may benefit Indian marketers as well. Moral obligation and thoughtfulness for the future are prime motivators for green purchasing (Liu et al. 2020). Though the inconsistency in sustainable behavior of consumers is primarily attributed to the gap between attitude and behavior of consumers (Newton and Meyer 2013). The uncertainty and indecisiveness about price, quality, awareness, and access to green products lead to the "green gap" (Perez-Castillo and Vera-Martinez 2021). The microscopic view of these underlying reasons for differences in consumer choices for green products has not been extensively interrogated.

This research is one of the seminal works aiming for demographic segmentation, followed by profiling based on psychographic, behavioral, and external marketing variables to present a comprehensive depiction of Indian GCS. Further, it identifies the homogenous factors characterizing the segments as essential for recommending suitable green products to the respective segments. Finally, the study aims to streamline the discriminating factors as the basis for the formation of clusters, thus depicting the heterogeneity among them. Thus, the major objective is (a) to classify the green customer segment based on demographic criteria; (b) factors classifying consumer behavior towards green products; and finally, (c) to identify the discriminating factor that classifies segments.

Literature review

Green market segmentation (GMS)

It is the finest approach to understanding the mindset of sustainable consumers and distinguishing them as per their homogeneous characteristics (Jaiswal et al. 2021). The literature posits that attributes of sustainable consumers can be largely classified into demographic, psychographic, and behavioral characterizations, out of which the demographic variables are important and have prevailed since the 1970s (Afonso et al. 2018). The knowledge of influencing factors will comprehend the drivers and barriers concerning environmentally friendly behavior and establish the reasons behind such unpredictable behavior.

Demographic variables

Ever since studies have used demographic segmentation approaches for categorizing green consumers for market strategizing, in the studies concerning the profiling of green consumers, the work of Anderson Jr and Cunningham (1972) and Berkowitz and Lutterman (1968) holds groundbreaking significance. Researchers observed a high correlation between sex and age with "Ecological Conscious Consumer Behavior" (ECCB) in the US market (Straughan and Roberts 1999). In these studies, along with Akehurst et al. (2012) and Jhamb and Mittal (2022), the sustainable consumers were generally middle-aged educated females with a superior economic status. So, these results indicate that females are highly receptive to green household purchases compared to males, and youth are superiorly ecologically cognizant compared to other age groups (Straughan and Roberts 1999; Akehurst et al. 2012).

Furthermore, consumers with higher educational backgrounds are more likely to take hold of the sustainability phenomenon (Mostafa 2006; Paul et al. 2016; Afonso et al. 2018). In the Egyptian setting, a study has indicated more ecological and green purchase awareness in male consumers than in females (Mostafa 2007). In addition, demographics were positively related to environmental label satisfaction in Australia; however, D'Souza et al. (2006) results indicate that old and middle-aged consumers showed a higher dissatisfaction level. Few studies have noted contrary results that demographics are not significant for studying sustainable

consumer behavior and are not suitable for segmenting green consumers in the Indian environment (Jain and Kaur 2006; Khare 2015; Kirmani and Khan 2016).

According to the reasoning presented, it is evident that demographic characterization offers a crucial segmentation foundation for identifying and categorizing consumer groups that are green (Pare and Pourazad 2017). It also provides different results in different contexts. Because of this, comprehensive research on the demographics of green consumers is required. This study examines the key demographics—such as age, education, gender, and occupation—that must be taken into account in order for GMS to be further applied generally in the Indian context.

Research Proposition 1: Demographics may act as a significant segmentation base for classifying green consumer groups.

Psychographic variables

Perceived environmental knowledge (PEK), environmental attitudes (EA), perceived consumer effectiveness (PCE), altruism (ALT), environmental concern (EC), and subjective norms (SN) are among the psychographic variables that have been depicted in mainstream studies as influencing factors for green consumer behavior (GCB) (Roberts 1996; do Paço and Raposo 2009; Jansson et al. 2009; Mostafa 2009; Peattie 2010; Awad 2011; Akehurst et al. 2012; Joshi and Rahman 2015; Yilmazsoy et al. 2015; Afonso et al. 2018; Jaiswal and Singh 2018; Nguyen et al. 2018; Matharu et al. 2021).

Uddin and Khan (2018) state that individuals' information about green products from friends, family, and peer groups plays a fundamental role in controlling their purchasing decisions. Jaiswal et al. (2022) state that perceived environmental knowledge (PEK) is a consumer's self-understanding and awareness of the ecosystem and its consequences for society and the natural environment. According to Jaiswal et al. (2022), PEK is based on the consumer's self-belief and judgment about how their green-related information affects society and the ecosystem through sustainable product consumption. Whereas environmental attitudes (EA) are defined as the individual's ability to evaluate the condition of the environment with certain favor or disfavor (Milfont and Duckitt 2010), they are recognized as one of the predictors of pro-environmental behavior (Uddin and Khan 2018). Straughan and Roberts (1999) stated that in the American market, perceived consumer effectiveness (PCE) is one of the main determinants of GCB. Further, the condition in which an individual acts on behalf of others without any expectation of benefits is explained as altruism (ALT) and it is considered a significant determinant of ecological preservation (Schwartz 1968, 1977; Granzin and Olsen 1991).

Researchers have also praised behavioral variables such as participation in recycling, resource conservation, and ecologically conscious green behavior (GB) (Mostafa 2009; Straughan and Roberts 1999; Verma 2017; Akehurst et al. 2012). When examining the GCB of various cultural contexts, including India, the green purchase intention (GPI) and green purchase behavior (GPB) were highlighted (Chan 2001; Akehurst et al. 2012; Paul et al. 2016; Wei et al. 2017; Bedard and Tolmie 2018; Joshi et al. 2019; Matharu et al. 2020).

External marketing cues

However, limited studies examined external marketing cues like social media marketing (SMM) and green advertising in studying the GCB (Sun and Wang 2019; Sun and Wang 2020; Jaiswal et al. 2021). Under developing economies such as India, consumers have embraced the green culture (GC) dimension (Ogiemwonyi et al. 2019; Ogiemwonyi et al. 2020), interpersonal influence (IPI) (Bandura 1986; Uddin and Khan 2018; Kumar et al. 2019), and green awareness (GA) (Suki et al. 2016; Ogiemwonyi et al. 2020).

SMM is the use of online applications and media in marketing meant for communication and collaboration (Erkan and Evans 2016; Sun and Wang 2019). They stimulate consumers to realize environmental concerns from a personal level to a social level (Froehlich 2009). Green habit (GH) is the semi-automatic performance of well-learned environmental behavior; it predicts the intention to behave in an environmentally friendly manner, which in turn influences the behavior (Ghazali et al. 2018). Such consumers spread word of mouth and promote awareness about green consumer behavior.

This green awareness (GA) is the leading variable that will influence behavioral outcomes (Yi 2019). According to Alamsyah et al. (2018), GA is the individual's state of mind to contribute by consuming positively and conserving the natural environment they live in. Such behavior includes an individual's willingness to buy ecological products instead of non-ecological products in the future, known as green purchase intention (GPI) (Ghazali et al. 2018). It also refers to a consumer being ready to buy green or organic products as a reason to protect nature (Jaiswal and Kant 2018). To spread green consciousness, green consumers use interpersonal influence (IPI), which is the act of convincing or persuading others and developing human beliefs and attitudes (Uddin and Khan 2018).

Green purchase behavior (GPB) is the act of indulging in society to benefit responsible behavior like ethical buying to bring about change in society, and subjective norms (SN) are how individuals perceive pressure from their social

peer groups for indulging or not indulging in green behavior (Taufique and Islam 2021). Green culture (GC) is a two-faceted component, where recycling, climate change effects, and health benefits make up the green part of it, while culture is the people's behavior, perceptions, and values (Ermolaeva 2010).

The aforementioned discourse suggests that in order to comprehend GCB, extensive investigation into the psychological aspects of consumers (PEK, EA, ALT, SN, GC, GH, and GA), combined with behavioral parameters (GB, GPI, and GPB), and external marketing cues and stimuli (IPI) is necessary. To address this gap, this research study seeks to conduct factor analysis on the Indian sample and propose logical consumer segmentation henceforth.

Research Proposition 2: External marketing cues and stimuli, in addition to behavioral aspects, have an impact on green consumerism.

Research Proposition 3: The higher the influence of factors on consumerism, the higher the discrimination between the segments.

Methodology

Research design

This study adopted a descriptive and correlational research design as an integrated, less-dominant QUAL-QUANT approach. The integrated research design is an approach that helps in the triangulation process of verifying reliability and validity. The literature review and expert opinion techniques help in the initial validity of content and construct, followed by the quantitative techniques for convergent, discriminant, and nomological validity. The stimuli for the questions were posted for prospective customers to react to as closed-ended, Likert 5-point rating scale opinions in order to establish the descriptive and inferential relationship between the latent constructs.

Sampling design

The non-probability criterion-based sampling method was applied. The major reason is that the exact population is unknown and they cover a wide area of product purchase and usage. Judgemental-criterion-based sampling techniques are the most widely used methods in the empirical literature (Clark and Watson 1995; Li et al. 2002; Walsh and Beatty 2007). The online survey sheet was shared through various networking platforms like LinkedIn, Twitter, and Facebook from September to November 2022. The researcher joined various groups related to Gen X, Gen Y, and Gen Z, environment groups, research groups, and management groups to send the invitation specifically to the customers who are attracted towards green products/packaging and the sampling unit consists of the customers of eco-friendly products who are specific and are buying these products recently. Customers from different cities in India participated in an online survey. A total of 510 responses were received, out of which 506 responses were valid after the removal of response and non-response error forms that were identified.

Existing literature like Clark and Watson (1995) and Turker (2009) noted a minimum sample size of 150 respondents to perform EFA. Similarly, according to Smith (2013) for the unknown population size, there needs to be a minimum of 384 sample responses. Further, for model testing, the sample size must satisfy both item-to-subject ratios (Hair et al. 2013; Churchill Jr and Peter 1984), and for every item, there are 10 responses. The chance for the occurrence of non-response errors is eliminated because the questionnaires were handed only to customers who agreed to provide the requisite level of agreement. Suitable guidelines were given to respondents, reminders were given, and data were cleaned.

Survey questionnaire

The survey questionnaire consists of three parts, firstly, the administrative question to ensure that the respondent is from the appropriate population, followed by classification questions that include demographics like gender and age group, and economic items like occupation and education, and finally, the target questions consist of the construct scales taken from several studies. The items for GA were taken from Chen et al. (2018); PEK (Mostafa 2006), GB (Roberts 1996; Ahn et al. 2012 GPB construct and Lee 2014's recycling participation items), EA (Mishal et al. 2017), IPI (Lee 2009), GPI (Chan 2001), ALT (Stern et al. 1993), SN (Sun and Wang 2019), GPB (Lee 2009), GH (Verplanken and Orbell 2003), SMM (Sun and Wang 2019), GC (Ogiemwonyi et al. 2020), and the summated scale (Likert) measured the agreement for each statement, ranging from 1 as strongly disagreeing to 5 as strongly agreeing.

Analysis approach

This study used different multivariate data analyses conducted in SPSS. First, exploratory factor analysis (an interdependence technique) followed by the cluster (interdependence technique) and discriminant (dependence technique) analysis was carried out. As per Mishra (2015), these methodologies can be amalgamated during the process of scrutinizing market data to augment the understanding of correlations among multiple variables.

Table 1 Reliability statistics

Manifest variables	No. of items	α
ALT	2	0.760
GB	6	0.655
GC	4	0.680
GA	4	0.607
PEK	5	0.708
IPI	5	0.888
SMM	3	0.653
SN	2	0.724
EA	3	0.860
GH	9	0.832
GPI	3	0.878
GPB	7	0.767

Table 2 KMO and Bartlett's test

Measures		Values
KMO		.931
Bartlett's test of sphericity	Approx. chi-square	11,717.097
	df	903
	Sig.	.000

2006; Hair et al. 2013). The internal consistency of the items in each construct in this study ranged from 0.607 to 0.888. The results are summarized in Table 1.

The items ALT1, GB3, SMM2, and SN3 were removed as the presence of these items affected the reliability of their constructs and the removal of them increased the α value above 0.60.

Ethical consideration

The study ensured that all ethical components were undertaken and considered with due care while conducting this research activity. The researchers ensure that there is no discrimination based on age, gender, or power among the participants. Accountability and neutrality were followed, and hence, the questions were designed so as not to create restlessness during the registration of the opinion. The authors have not used any AI tools for content formation, and this work is solely written by equal contributions.

Results

Demographic analysis

The descriptive results reveal that the majority of the sample is in Gen Y (67%) and is made up of postgraduate (47.8%) males (63.4%) who are mostly employed (48%). In terms of age distribution, 20.6% were Gen Z, 67% represented Gen Y, and 12.5% constituted Gen X. The gender-wise distribution states that 63.4% of respondents were male, and 36.6% were female. According to occupation, 48% were employees, followed by students (37.9%), others (9.9%), and own businesses (4.2%). In terms of the highest education level, postgraduates were 47.8%, trailed by those above post-graduation (31.6%), graduation (17%), and intermediate/high school (3.6%).

Reliability analysis

It determines the construct's internal consistency and is assessed using Cronbach's alpha (Wei-he and Qiu-yan

Exploratory factor analysis (EFA)

An EFA was performed on the overall scale and overall sample using PCA (principal component analysis). The rotation opted for is varimax, and the minimum factor loading criteria is considered to be 0.50. The commonality of the scale, which specifies the variance in each dimension, was 0.50 and above.

The Bartlett's test of sphericity, as a measure of the statistical probability that the correlation matrix has significant correlations among some of its components, is significant, χ^2 ($n = 506$) = 11717.097 ($p < 0.001$), which indicates its suitability for factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA), which indicates the suitability of the collected data for factor analysis, was 0.931. Generally, data with MSA values > 0.800 is considered suitable for factor analysis. The factor analysis output is presented in Table 2. Finally, the EFA results yielded 8 factors accounting for 61.693% of the variation in the data. Table 3 presents the total variance explained.

The rotated component matrix gives a clear picture of the factors with significant loadings of relevant manifest variables. The eight factors along with the items included and their factor loadings are presented in Table 4 in descending order, that is, the first factor being the most important, the second one being the second in importance, and so forth.

The items (GB5, GC3, GA3, GA4, PEK1, PEK2, GPB4, GPB5, GPB6, and GPB7) either did not load on any factor significantly or loaded onto a dimension other than its original factor independently. So, the above items were excluded from the subsequent analysis.

The Cronbach's alpha values for the groups of variables under each factor are presented in Table 5.

From Table 5, it is seen that Cronbach's alpha is greater than 0.7 in all cases. It shows that variables under each factor have high internal consistency and are unidimensional.

Table 3 Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	12.932	30.074	30.074	12.932	30.074	30.074	6.245	14.524	14.524
2	3.574	8.312	38.385	3.574	8.312	38.385	4.269	9.928	24.452
3	3.114	7.242	45.627	3.114	7.242	45.627	3.782	8.794	33.246
4	1.842	4.284	49.912	1.842	4.284	49.912	3.255	7.571	40.817
5	1.585	3.686	53.598	1.585	3.686	53.598	2.896	6.734	47.551
6	1.250	2.906	56.504	1.250	2.906	56.504	2.485	5.779	53.330
7	1.177	2.737	59.241	1.177	2.737	59.241	1.798	4.182	57.512
8	1.054	2.452	61.693	1.054	2.452	61.693	1.798	4.181	61.693
9	.968	2.252	63.945						
10	.942	2.191	66.136						
11	.838	1.950	68.085						
12	.800	1.861	69.947						
13	.788	1.832	71.779						
14	.719	1.672	73.450						
15	.705	1.639	75.089						
16	.672	1.564	76.653						
17	.642	1.493	78.146						
18	.604	1.406	79.551						
19	.570	1.326	80.877						
20	.558	1.297	82.174						
21	.527	1.225	83.399						
22	.498	1.158	84.557						
23	.484	1.126	85.683						
24	.460	1.069	86.752						
25	.438	1.018	87.769						
26	.428	.995	88.765						
27	.415	.965	89.729						
28	.398	.926	90.655						
29	.385	.896	91.551						
30	.366	.852	92.403						
31	.336	.782	93.185						
32	.312	.726	93.912						
33	.301	.700	94.612						
34	.295	.686	95.298						
35	.279	.648	95.946						
36	.273	.635	96.581						
37	.246	.571	97.152						
38	.234	.545	97.697						
39	.223	.517	98.215						
40	.207	.482	98.697						
41	.203	.473	99.170						
42	.191	.444	99.614						
43	.166	.386	100.000						

Cluster analysis

The next step is to use cluster analysis to carve out the clusters and segment them concerning the output. The clustering variables used in the study are demographic variables such as age, gender, education, and occupation. The reason for specifically choosing the four variables for clustering is that the intensity of technology usage, purchase power,

Table 4 Rotated component matrix

Items	Dimensions							
	Factor 1: green habit	Factor 2: green culture, awareness and attitude	Factor 3: interpersonal influence	Factor 4: green purchase intention and behavior	Factor 5: social media marketing and subjective norms	Factor 6: green behavior	Factor 7: Perceived environmental knowledge	Factor 8: altruism
ALT2								.767
ALT3								.746
GB1						.648		
GB2						.605		
GB4						.652		
GB6						.585		
GB7						.562		
GC1		.653						
GC2		.606						
GC4		.715						
GA1		.629						
GA2		.692						
PEK3							.520	
PEK4							.708	
PEK5							.671	
IPI1			.660					
IPI2			.784					
IPI3			.735					
IPI4			.621					
IPI5			.737					
SMM1					.538			
SMM3					.713			
SMM4					.665			
SN1					.633			
SN2					.626			
EA1		.673						
EA2		.722						
EA3		.562						
GH1	.765							
GH2	.807							
GH3	.709							
GH4	.714							
GH5	.695							
GH6	.814							
GH7	.784							
GH8	.801							
GH9	.809							
GPI1				.633				
GPI2				.701				
GPI3				.704				
GPB1				.586				
GPB2				.589				
GPB3				.630				

Table 5 Factor's reliability

Factor	α	No. of items
1	0.832	9
2	0.861	8
3	0.880	5
4	0.838	6
5	0.763	5
6	0.731	5
7	0.744	3
8	0.746	2

Table 6 Number of cases in each cluster

Cluster	1	304.000
	2	41.000
	3	97.000
	4	64.000
Valid		506.000
Missing		.000

Table 7 Final cluster centers

	Clusters			
	1	2	3	4
Gender	Male	Male	Female	Male
Age	Gen Y	Gen Y	Gen Z	Gen Y
Education	Post graduation	Graduation	Graduation	Post graduation
Occupation	Employee	Employee	Student	Others

data obtained from the hierarchical cluster analysis. Table 6 represents the number of cases in each cluster, where the first cluster is the largest, comprising 304 cases, followed by a third with 97 cases, a fourth with 67 cases, and a second with 41 cases.

Table 7 summarizing the characteristics of the four clusters highlights that age, gender, income, and highest educational level are different in clusters 1 and 3. Clusters 2 and 4 are almost the same in age and gender, although occupation and education variables are different.

The ANOVA (Table 8) significance levels demonstrate how significantly all four clusters differ from one another with regard to the clustering variables. The variables are all significant with values less than 0.05, thus proving the significance of these variables in differentiating the groups and segmentation.

An integrated approach to cluster analysis and exploratory factor analysis

Among the clusters formed, however, there were only two clear and distinct clusters, i.e., cluster 1 and cluster 3. These clusters comprised the majority of the study sample as well. Consequently, an exploratory factor analysis (EFA) has been conducted for each of the two clusters to ascertain if the factors within the two consumer segments are identical or if the factors that were extracted and their respective significance have evolved. Cluster 2 was not included for further analysis as the exploratory factor analysis cannot be done if the sample is less than 50 (Memon et al. 2020; Hair et al. 2018). Cluster 4 was also excluded from the analysis as the number of cases was near 50 (64), narrowly satisfying the 5:1 (sample to the variable) ratio proposed by Hair et al. (2018), and it also differed from cluster 1 only for the occupation variable. So, clusters 1 and 3 were subjected to EFA.

An EFA was performed separately on the two clusters. The varimax rotation and the minimum factor loading criteria were set to 0.50. The commonality of the scale was over 0.50 for the two clusters.

The Bartlett's test of sphericity results were significant for clusters 1 and 3. For cluster 1, χ^2 ($n = 304$) = 7400.883 ($p < 0.001$), and for cluster 3, χ^2 ($n = 97$) = 2444.842 ($p < 0.001$). The KMO was 0.917 for cluster 1 and 0.824 for

knowledge of using, and preference of alternatives are higher towards green consumption and can be categorized or classified easily through these classification questions compared to other variables, as considering all socio-demographic and economic factors could lead to complexity and confusion. Therefore, this study limits itself to major variables, providing scope for future research on other categorical constructs. Hierarchical cluster analysis is used to find the clusters. With a Euclidean distance of 10 in the dendrogram, four clusters were formed. In order to obtain more details about the clusters, *k*-means clustering was performed using the output

Table 8 ANOVA

	Cluster		Error		F	Sig.
	Mean square	df	Mean square	df		
Gender	.916	3	.228	502	4.014	.008
Age	31.299	3	.139	502	225.162	.000
Education	55.361	3	.297	502	186.439	.000
Occupation	99.761	3	.207	502	482.677	.000

Table 9 Cluster-specific KMO and Bartlett's test

KMO and Bartlett's test		Cluster 1	Cluster 3
KMO		.917	.824
Bartlett's test of sphericity	Approx. chi-square	7400.883	2444.842
	df	861	630
	Sig.	.000	.000

cluster 3. Finally, the EFA resulted in nine factors for cluster 1, accounting for 65.933% of the variation in the data. For cluster 3, 8 factors were extracted with 71.499% of the variation in the data. These results are specified in Table 9.

The rotated component matrix for cluster 1 is presented in Table 10. The nine factors, along with the items included and their factor loadings, are presented in Table 10 in descending order, that is, the first factor being the most important, the second one being the second in importance, and so forth.

The rotated component matrix for cluster 3 is presented in Table 11. The eight factors along with the items included and their factor loadings, are presented in Table 11 in descending order, that is, the first factor being the most important, the second one being the second in importance, and so forth.

Table 12 summarizes a comparative analysis of factors that are important for consumers in three cases: factors for the entire sample and factors for the two different clusters of consumers. It may be observed that factors that are important for the entire group are a bit different in the clusters. We can see the changes in the names of latent variables in each cluster. This suggests that manifest variables are not the same as the latent variables in the clusters in a few cases.

An integrated approach of factor, cluster, and discriminant analysis

Following the cluster analysis, discriminant function was used to ascertain the adequacy of cluster solution and the degree to which every case is correctly classified, validating the employed grouping methodology (Mehta and Chahal 2021). In this instance, the obtained 506 responses were utilized to both validate the model under investigation and estimate the discriminant function. The estimated quadratic discriminant function's (QDF) performance was assessed in order to validate the creation of the four green consumer groups, each of which has distinct sociodemographic traits in relation to the main factors of GCB (Lawson 1980; Carvalho et al. 2015). The classification accuracy of the discriminant function was 78%, 71%, 76%, and 73% for consumers belonging to groups 1, 2, 3, and 4, respectively. Hence, it was proven that the estimated QDF confirms the segmentation results of existence of four groups of green consumers,

given its high level of correct classification of individuals in different groups, out of which two are well-discriminated groups (1 and 3) with regard to the socio-demographic factors in the cluster analysis, and the other two small groups (2 and 4) which does not have the enough sample size (Hair et al. 2018) to be included in further analysis. Therefore, the categories of green consumers that were determined in the clustering technique could be validated by the QDF using the study data.

To find out whether the eight factors carved out for the entire group of respondents (objective 1) discriminate between the two groups and which factor has the highest discriminating power, discriminant analysis is adopted. The variables that are identified to differentiate between two or more groups are called discriminating variables. The factor scores were calculated for the eight factors that are used as independent variables or discriminating variables. The dependent variable is a binary that takes on two values, 0 and 1. We have specified the value of the dependent variable as 0 for members of cluster 1 and 1 for cluster 3. The discriminant function using the unstandardized coefficients in Table 13 can be written as follows:

$$D = 0.002 - 0.031 * GH - 0.461 * GCAA$$
$$+ 0.436 * IPI + 0.192 * GPIB + 0.685 * SMMSN$$
$$+ 0.107 * GB + 0.014 * PEK - 0.218 * ALT$$

According to Mishra (2015), Wilks' lambda for the discriminant function is used to test whether the independent variables or the selected discriminating variables discriminate between the groups. If it is significant, we can conclude that there is enough discriminating power in the function and that it is statistically valid. This means that if the significance level is less than 0.10, we can assume that the variables have discriminating power that is significant at a 10% level. Any value less than 0.10 would suggest that the variables discriminate against the group, and it is statistically significant. From Table 14, it is evident that in this case, the value is 0.089, which is less than 0.10, so the function is supposed to be statistically significant in discrimination as a whole. A statistically significant value would mean one can reject the null hypothesis that the two groups have the same mean discriminant function scores and conclude the model is discriminating. The significance of Box's M test will test the homogeneity of variance, which should be less than 0.05. From Table 15, it can be inferred that the value is 0.006, so there is a difference between the two clusters, rejecting the null hypothesis of equal population co-variances.

The greatest shared variance and the relative significance of the variables in differentiating the groups are provided by the structure matrix and the standardized coefficient matrix. The structure matrix and standardized coefficient matrix give information on the maximum shared variance

Table 10 Rotated component matrix: cluster 1

Items	Dimensions								
	Factor 1: green habit	Factor 2: interpersonal influence	Factor 3: social media marketing and subjective norms	factor 4: green purchase behavior	factor 5: green behavior	Factor 6: altruism and green culture	Factor 7: environmental attitude	Factor 8: green purchase intention	Factor 9: perceived environmental knowledge
ALT2						.805			
ALT3						.777			
GB1					.614				
GB2					.536				
GB4					.659				
GB6					.567				
GB7					.602				
GC1						.715			
GC2						.719			
PEK4									.716
PEK5									.708
IPI1		.733							
IPI2		.788							
IPI3		.706							
IPI4		.645							
IPI5		.700							
SMM1			.613						
SMM3			.735						
SMM4			.643						
SN1			.651						
SN2			.673						
EA1							.759		
EA2							.820		
EA3							.722		
GH1	.730								
GH2	.805								
GH3	− .678								
GH4	.739								
GH5	.704								
GH6	.811								
GH7	.797								
GH8	.762								
GH9	.776								
GPI1								.688	
GPI2								.767	
GPI3								.763	
GPB1				.537					
GPB2				.605					
GPB3				.729					
GPB5				.527					
GPB6				.567					
GPB7				.625					

Table 11 Rotated component matrix: cluster 2

Items	Dimensions							
	Factor 1: green habit	Factor 2: green culture and awareness	Factor 3: interpersonal influence	Factor 4: green purchase intention and behavior	Factor 5: environmental attitude	Factor 6: perceived environmental knowledge	Factor 7: green behavior	Factor 8: altruism
ALT2								.806
ALT3								.766
GB2							.671	
GB6							.682	
GB7							.725	
GC1		.771						
GC2		.642						
GC4		.851						
GA1		.793						
GA2		.769						
PEK3						.739		
PEK4						.737		
IPI1			.721					
IPI2			.819					
IPI3			.835					
IPI4			.622					
IPI5			.807					
EA1					.713			
EA2					.764			
EA3					.679			
GH1	.787							
GH2	.814							
GH3	− .677							
GH4	.613							
GH5	.685							
GH6	.851							
GH7	.769							
GH8	.863							
GH9	.854							
GPI2				.578				
GPI3				.709				
GPB1				.655				
GPB2				.674				
GPB3				.681				
GPB5				.599				
GPB6				.598				

and relative importance of the variables in discriminating the groups. The explanatory power of each predictor is mentioned in Table 16. It is clear that social media marketing and subjective norms have the most shared variance and the most discriminating power in this study, followed by interpersonal influence and green purchase intention/behavior.

From the above classification table (Table 17), the cluster group appropriateness of classification could be understood. Overall, it can be concluded that 314 out of 401

(78.3%) have been correctly classified using the eight independent variables, hence confirming the adequate validity (Malhotra and Dash 2014). The discriminant analysis should yield a classification accuracy that is at least 25% higher than the result obtained by chance. That is, for two groups of the same size, one would anticipate a 50% hit ratio by chance, or 1/2 = 0.50. Hence, the improvement over chance is 28.9% (78.9–50%), which is greater than 25%, and the discriminant analysis's validity is deemed

Table 12 Comparison of factors across the overall group and the clusters

Sample	Factors								
	1	2	3	4	5	6	7	8	9
Overall	Green habit	Green culture, awareness and attitude	Interpersonal influence	Green purchase intention and behavior	Social Media marketing and subjective norms	Green behavior	Perceived environmental knowledge	Altruism	-
Cluster 1	Green habit	Interpersonal influence	Social Media marketing and subjective norms	Green purchase behavior	Green behavior	Altruism and green culture	Environmental attitude	Green purchase intention	Perceived environmental knowledge
Cluster 3	Green habit	Green culture and awareness	Interpersonal influence	Green purchase intention and behavior	Environmental attitude	Perceived environmental knowledge	Green behavior	Altruism	-

Table 13 Canonical discriminant function

Canonical discriminant function coefficients	Function 1
Green habit	−.031
Green culture awareness and attitude	−.461
Interpersonal influence	.436
Green purchase intention and behavior	.192
Social media marketing and subjective norms	.685
Green behavior	.107
Perceived environmental knowledge	.014
Altruism	−.218
(Constant)	.002

Table 14 Wilks' lambda

Test of function(s)	Wilks' lambda	Chi-square	df	Sig.
1	.966	13.730	8	.089

satisfactory (Chan 1999; do Paço and Raposo 2009; Malhotra and Dash 2014). The classification of the result table above indicated that out of 304 around 240 cases (78.9%) were predicted to be cluster 1 and it was originally placed as cluster 1. On the other hand, out of 97 cases, 74 cases (76.3%) were correctly predicted to be cluster 3 and were in cluster 3 in reality. In total, around 105 cases were ungrouped or did not fall in any one of the clusters above.

Table 15 Box's *M* test results

Box's *M*		62.534
F	Approx.	1.682
	df1	36
	df2	11,2767.313
	Sig.	.006

Discussion

Even though new age consumers are deeply concerned about environmental issues, a company employing green marketing may still find it challenging to translate this concern into sales. The findings of this study provide a significant contribution to the development of green business strategies and demonstrate how sustainable marketing can be done with the help of fine-tuned green market segmentation. Understanding the exclusive factors that influence a similar set of customers (market segment) to adopt green will benefit marketers in effectively designing strategies to promote green consumerism (Jain and Kaur 2006). The research results indicate the cohesion between consumer demographics and emerging practices like green product purchasing habits, embracing the green culture as a community and enhanced awareness of green retail stores. The result establishes a sustainable attitude in consumers' minds and encourages eco-friendly product purchase discussions among friends. Consequently, the purchase intention for organic, eco-labeled, and cruelty-free products is also unearthed to lead to an ecological society in the longer run.

The research contributes to the existing literature in several ways. In the recent Indian green segmentation studies like Jaiswal et al. (2021), psychographic and behavioral variables were used to classify the Indian green segments and profiling is done based on demographics, which resulted in three segments with adult (gen y) males as major characters, which is partially consistent with the findings of the current research. Mehta and Chahal (2021) classified the green segments only in the Punjab state of India, based on the attitude towards green products, and profiling is done based on different consumer attitude dimensions. Similarly, Kirmani and Khan (2016) study used environmental attributes as the clustering variates and identified three green segments in New

Table 16 Standardized canonical discriminant function coefficients and structure matrix

Standardized canonical discriminant function coefficients	Function 1	Structure matrix	Function 2
Green habit	−.031	Social media marketing and subjective norms	.691
Green culture awareness and attitude	−.480	Green culture awareness and attitude	−.484
Interpersonal influence	.434	Interpersonal influence	.431
Green purchase intention and behavior	.192	Altruism	−.224
Social media marketing and subjective norms	.695	Green purchase intention and behavior	.195
Green behavior	.108	Green behavior	.105
Perceived environmental knowledge	.014	Perceived environmental knowledge	.020
Altruism	−.226	Green habit	−.014

Delhi; the results were contrary and proved a statistically insignificant link between the clusters and demographics; in contrast, Jain and Kaur (2006) proved significant linkages. This proves that green segmentation in India is still in a nascent stage and the present research study fills the gaps in the existing literature by focusing on the complete Indian population. This research results highlight the role of different generations in comprehending green consumerism in India. *The findings of cluster analysis conducted with demographic (age and gender) and economic (highest education level and occupation) variables as cluster variates depicted two major and significant green clusters in India, namely "Green Dads"—Gen Y males with a post-graduation degree, who are currently employees of any company or organization (cluster 1), and "Green Janes"—Gen Z females with a graduation degree and currently in student roles from various colleges and institutions.* The two clusters are different for all the variables considered for clustering them. Therefore, green marketers may consider their granularity while targeting the groups for decision-making in the marketing strategy.

To target a segment, the study of consumer behavior concerning green variables has induced the researcher to investigate whether the factors influencing green consumer behavior are different in the two groups, i.e., to find whether the two clusters will have different behavior for

Table 17 Classification of results

Cluster			Predicted Group Membership		Total
			0	1	
Original	Count	0	240	64	304
		1	23	74	97
		Ungrouped cases	58	47	105
	%	0	78.9	21.1	100.0
		1	23.7	76.3	100.0
		Ungrouped cases	55.2	44.8	100.0

78.3% of original grouped cases were correctly classified.

sustainability. For cluster 1, "*Green Dads*"—*Gen Y males with a postgraduate degree*, indulging in green purchasing habits is the most important driver as this generation believes global warming is the cause of human activities and purchases green products more frequently compared to other generations. The importance of discussions and suggestions from friends and preferring to go shopping with them is high. This cluster often received information about green products from social media. They even consider exchanging sustainable information and conducting the green product search through social media as very fashionable. Cluster 1 respondents are majorly supported by their peer groups and important people for indulging in eco-friendly behavior. The results also support the (Ottman 2011) statement that Gen Y known as Millennials are the tech-savvy generation and grown up with the Internet; they express their opinions and gather immediate responses around the world regarding authentic marketing practices and eco-friendly products through social networks and blogging. This generation will seek to work with socially responsible employers and experience green activities in their college days.

On the other hand, cluster 2, "*Green Janes*"—*Gen Z females with a graduation degree*, green habits are the top most influencing determinant, followed by green culture and awareness. Gen Z is the first one to be brought up in the eco-conscious world; by learning about environmental issues in school, green is also present in their everyday life (Ottman 2011), so the level of green awareness and culture is high, green is now replacing blue as a sign of India's sustainable awareness (Rajput et al. 2022). There is no role of social media marketing and subjective norms in influencing the GCB of this cluster. The level of environmental attitude is high as they consider recycling as their everyday activity. Gen Z's knowledge of eco-friendly packaging and products is high compared to Gen Y, as the sustainable products are prominent in their family's shopping list. This supports the findings of Jain and Kaur (2006), which indicated that conservation behavior and environmental activism are high in young females, most of the environment-related

information-seeking behavior is present in youngsters, and highly educated people tend to behave more sustainably than the low-educated ones.

To assist the marketers in designing the differentiation strategies, it is essential to find out which of these factors had the most discriminating power in the two segments. It is evident from the results of the discriminant analysis that the factors, social media marketing and subjective norms, had the greatest discriminating power. This is consistent with the above discussion and validated the results of cluster and factor analysis that Gen Y gets influenced by social media and the opinions of important people in their life for engaging in green behavior and making decisions regarding eco-friendly products. Gen Z gets motivated by the day-to-day green activities and the culture they were brought up with for their eco-friendly purchasing.

Implications and future research directions

Practical implications

Green consumer behavior in India is mainly concentrated on Green Dads, i.e., *Gen Y male employees*, so marketers must partner up with the employers of various companies and design various sales promotions like free employee green stocks ownership plans for loyal customers, ethical employee schemes, cleaner commute incentives, employee discounts and rebates for greener commuting options (cars or cycles) and sustainable home upgrades (energy-efficient appliances, smart thermostats), coupons to encourage the repeat green purchases, and vouchers for the various green gyms. This segment relies upon social media for the purchase of sustainable products, and as communication is one of the four pillars of ecological business excellence, the communication of promotional information like product's functional benefits, ISO Type I eco-labels generated for the company's product by third parties, and visual aspects of green campaigns, through social media, will aid the marketers in increasing the sales of green products for this particular segment. The other important segment is Green Janes, i.e., Gen *Z female students*, for which the GC and IPI have a significant influence on their GCB. The cause-marketing initiatives and emotional positioning build up equally constructive alliances between the brands and this segment, building long-term loyalty. The advertisements that focus on warm glow, status-symbol, and connection with nature highly influence this generation's female students. Maintaining public relations will inhibit their green culture, thus influencing their perception of the brand and encouraging positive word-of-mouth publicity during the walking tours and trails.

Societal implications

The policymakers at the same time should continue designing various green activities like "Haritha Haram," "green India challenge," "green fund," "Mission Kakatiya," "LED street lighting smart cities mission", and "Swachh Bharat"" mission, in which the peer groups can actively participate, which aids the environmental and sustainable discussions among the peer groups in both the generations Y and Z. The government should subsidize research on green technology for the Indian society to convert their lifestyle into an eco-friendly one like using solar power, purchasing biodegradable products, and using recycled paper. The perceived environmental knowledge in Indian society is low, so the government and policymakers should impart environmental knowledge for future generations to develop a sustainable mindset. NGOs should necessarily communicate the ecological issues around the world effectively through various articles and blogs using attractive visual aids and interesting facts.

Theoretical implications

The factor analysis can be further extended by studying the cause and effect, mediation and moderation relationships, between the variables through structural equation modelling, and comparing the path models of different generations. The fast-shifting Indian GCB should be addressed by conducting longitudinal and experimental studies. This study is conducted in India, providing a basis for future studies to compare with the eco-friendly behavior in developed countries like the USA and the UK. The sample size for the comparative study of different generations of consumers like Baby Boomers, X, Y, and Z, can be selected according to the population proportions from credible sources like census data. As SMM has the highest discriminating power, future researchers can narrow down to particular social media apps like Instagram, Facebook, and Snapchat, and study their impact on GCB. Also, the potential research can focus on specific youth and teenage concentrated areas like fashion, food, and electronics and examine the purchase behavior of Gen Y and Z.

Conclusion

About the integrated methodological approach conducted on consumer green behavior, it can be concluded that several factors influence green consumer behavior. Among them, green habits, green culture awareness and attitude, and interpersonal influence are the most significant. The green purchase intention and behavior are also high in Indian society implying the potential for growth of sustainable living.

Social media also plays a vital role in consumer decision-making and contributes mainly to increasing the ease to search for and purchase green products.

From the results of cluster analysis conducted on the demographic and economic variables for the segmentation purpose, it is evident that there are two major groups of green consumers in India. The first and foremost one is the Generation Y male cluster (Green Dads), with a postgraduate degree and currently in the employee role of any company or organization. The second one is the Generation Z cluster, with the female population (Green Janes), who are currently students and already possess a graduation degree.

The antecedents of cluster one green consumer behavior are green habits, interpersonal influence, social media marketing, and subjective norms. These tech-savvy Gen Ys can express their environmental concerns and opinions about green products and culture through blogging and texting. The second cluster thinks that the 3Rs (reduce, reuse, and recycle) of waste management are as common as reading, writing, and arithmetic. They are influenced by the green culture they were brought up with and the ecological awareness given to them by their previous generations. The study reinforces that social media marketing and subjective norms are the most influential factor in discriminating between the two groups. Hence, it is fortified that green marketers must carefully assess the identified granular green segments and design various positioning strategies according to their behavioral and psychological antecedents for creating a successful eco-friendly market.

Declarations

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