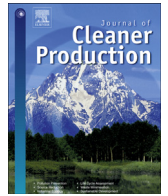




Contents lists available at ScienceDirect

## Journal of Cleaner Production

journal homepage: [www.elsevier.com/locate/jclepro](http://www.elsevier.com/locate/jclepro)

# Investigating factors influencing consumer decision-making while choosing green products

Paraschos Maniatis

School of Business, Department of Business Administration, Athens University of Economics and Business, Patision 76, GR-104 34, Athens, Greece

## ARTICLE INFO

*Article history:*

Received 28 July 2014

Received in revised form

11 February 2015

Accepted 13 February 2015

Available online xxx

*Keywords:*

Green products

Green marketing

Green consumerism

## ABSTRACT

There are multiple indicators known to researchers influencing consumer's knowledge, commitment, and general awareness of consumers regarding green products. However, there is lack of structural constructs defining how these indicators interact with different dimensions of consumers' green consciousness while choosing green products. This research investigates the influence of consumers' knowledge, commitment, and general awareness related to green products on their green consciousness while making decisions for buying green products. Consumers visiting four shopping malls in the city of Athens have been sampled based on their choice of green food products and requested to fill a self-assessment card. A structural construct is presented in this research using data collected from 253 respondents visiting four shopping malls in Athens. The techniques used are Principal Component Analysis, confirmatory factor analysis, and structural equation modeling. The outcome of the research is a construct showing the influence of 15 indicators reflecting consumers' knowledge, commitment, and general awareness of consumers about green products on four domains of their green consciousness: environmental benefits, economic benefits, green reliability, and green appearance. The construct divides the indicators into general awareness, knowledge, and commitment of consumers and presents their interactions with the four consciousness domains. The model presents how consumers make use of their general awareness of, knowledge of, and commitment to green products in shaping their overall consciousness about environmental benefits, economic benefits, green reliability, and green appearance such that they can make a decision for purchasing a green product. This research value adds to the limited empirical knowledge base on structural constructs showing interactions among key variables in influencing consumers' green consciousness and decision-making for purchasing products with green attributes. The model also clarifies how consumers weigh environmental and economical benefits while choosing green products. The structural construct is a useful addition to the existing constructs helpful for green labelers and marketers in their strategies for promoting green products. The only limitation of the research is that the construct has been formed based on data collected from consumers in one city (Athens). However, the consumers sampled are general consumers of household consumables that purchase a few green products among their regular purchases.

© 2015 Elsevier Ltd. All rights reserved.

## 1. Introduction

The concept of green products is related to sustainable manufacturing and supply chain management, which involves environment friendly, planet friendly, and people friendly standards, technologies and practices (Paveich, 2012). The concept of green is extended to almost every process step of procuring raw materials, producing, storing, packaging, shipping, and distribution

of products (Paveich, 2012). For developing green processes in an entire supply chain, an organization need to investigate the environmental and other factors influenced by the supply chain, identify the changes needed in the existing supply chain, identify sustainability challenges, identify their solutions, identify performance measures (and ways of measuring them), and develop a long-term sustainability plan (Beamon, 1999).

The consumers are informed about the concept of green products through green marketing (Peattie and Charter, 2003). Peattie and Charter (2003: p. 736) stated that green marketing has evolved new opportunities for market development,

E-mail address: [pman@aub.gr](mailto:pman@aub.gr).<http://dx.doi.org/10.1016/j.jclepro.2015.02.067>

0959-6526/© 2015 Elsevier Ltd. All rights reserved.

differentiation, cost advantage, niche building, and customer segmentation. However, they also emphasized that it is very difficult to isolate green consumers from the rest given that every consumer prefers one or another attribute of a green product. Even more challenging is the fact that it is very difficult to correlate green consumers' attributes with their other segmentation attributes, like demographics, age, gender, race, and such other attributes (Peattie and Charter, 2003). Peattie and Charter (2003: p. 738–742) concluded that marketers should know about what green consumers are looking for in a green product before positioning their green labeling. It needs to be ascertained whether they are looking at true ecological performance of the product (socially responsible consumption) or are looking for personal benefits (Peattie and Charter, 2003). Mohr et al. (2001) defined socially responsible consumption as the pattern of purchasing and consuming products that maximizes long-term benefits for, and minimizes hazardous effects on consumers and societies.

In spite of lack of adequate research about consumers' behavior in choosing green products, the fact that the consumers spend \$25 Billion per year on green products in the US alone cannot be ignored (Ferrell and Hartline, 2011). Ferrell and Hartline (2011: p. 72) argued that green labeling has done wonders in increasing product sales in the US and Europe and hence, marketers consider it as a major differentiator while defining product specifications. Kotler (2000: p. 148) reported that 42% consumers in US are ready to pay premiums for green products. However, green consumers are sophisticated buyers and the marketers need to know their preferences while designing a green product (Banyte, Brazioniene and Gadeikiene, 2010a). The field of green consumerism is still evolving and hence, significant research-based contributions are needed (Young et al., 2010).

In a broad context, sustainability may be viewed as balancing among social, ecological, and environmental goals and their consequences on societies and our planet (Elkington, 1998). The modern perspective of sustainable consumption is that the current generations should fulfill their needs without compromising the ability of future generations in fulfilling their needs (Schaefer and Crane, 2005). The primary responsibility of sustainable consumption is with the consumers that are expected to translate their beliefs and values about sustainability into their demands and purchasing behaviors (Schaefer and Crane, 2005). This in turn will help producers and marketers evolve a system for fulfilling their needs by studying the sustainable beliefs, values, attitudes, and behaviors of consumers (Schaefer and Crane, 2005). However, the traditional regression methods of studying consumer attitudes and behaviors may not reveal their belief and values pertaining to sustainable consumption (Manichelli et al., 2014).

There may be hidden attributes that can be surfaced by studying interrelationships among multiple variables (Manichelli et al., 2014). White, MacDonnell and Ellard (2012) and Pepper et al. (2009) emphasized that the values motivating socially responsible consumption provide guidelines for best possible living and considering welfare and justice for others (including current and future generations). As per Schwartz's theory, social values in an individual comprise respect for customs and traditions, conformity to social norms, and considering welfare of others that may be directly linked with the individual (Schwartz, 1992, 1994).

How do the manufacturers and marketers discover consumer values and beliefs? Do they really care for them? Akenji (2014) emphasized that producers will make products only if there is a market for them. Their primary concern has always been revenues and profits. The consumer behaviors and purchasing patterns have been determining the product types and features they have been producing. The producers have been communicating favorable product features to consumer likings back to them through

advertisements and creating brand loyalties. Why should this change in green consumerism?

If consumers drive what is produced, they can drive sustainable production. A powerful segment of ecologically conscious and well-informed consumers can put pressures on the producers. However, this is where there is a flaw. Consumers may know a lot about sustainable products, but how will they know if the product in a package meets the standards and norms? Here, a new form of branding may be emerging – the branding of green labels, ecological certifications, and the certification authorities. The Triple “I” framework by Akenji and Bengtsson (2010) clarifies this emerging theory. Triple “I” stand for “interest, influence, and instruments.” The actor (consumer) equipped with Triple “I” taking help of certain indicators shall be focused on the consequences (social, economical, and environmental) (Akenji and Bengtsson, 2010; Akenji, 2014). The way consumers perceive these indicators need to be studied by marketers such that they can satisfy the consumers equipped with Triple “I”. The indicators may be interconnected through relationships that are not well understood by marketers. Scholars like Haws et al. (2013), Tseng and Hung (2013), Boztepe (2012), Thogersen (2011), Thogersen et al. (2012), Banyte, Brazioniene and Gadeikiene (2010a), Kai et al. (2013) and Young et al. (2010) have explored multivariate relationships among indicators of customers' attitudes and behaviors pertaining to green consumerism.

This study is focused upon consumers' commitment (interest) and their knowledge and general awareness about green products (influence). The third I (instruments) is not incorporated in this study because it may involve deep study of knowledge sources, green labels, certifications, standards, and such other technical systems that is not in the scope of this research. The research investigates the influence of consumers' commitment, knowledge, and general awareness on their green consciousness while buying products. The influence can be studied by investigating the indicators, as described by Akenji and Bengtsson (2010). They proposed many indicators, like infrastructure, policies, standards, certifications, and systems. However, what are the actual indicators that influence green consciousness? Are the consumers connected with the system of sustainable production or are simply treated as scapegoats? This research is an attempt to investigate the facts on the ground. The indicators are chosen from theories reviewed in the “Theoretical Review” section.

This research has the following objectives:

- (a) To investigate the indicators determining consumers' knowledge of, commitment to, and general awareness about green products
- (b) To investigate the hidden attributes of green consciousness
- (c) To investigate how the indicators determining consumers' knowledge, commitment, and general awareness are related with the attributes of green consciousness

The location of this research is Athens (the largest and oldest city in Greece). However, this research is not specific to Greece. The consumers sampled are general consumers of household consumables that purchase a few green consumer products among their regular purchases. There is nothing special in the sample that may differentiate it from buyers from rest of the world, except that they live in Athens. The outcomes of the research are significant for green consumer behavior for buying green consumer products as the data is related to this context only. For purchase behaviors of other green products, further research is suggested.

In this research, a combination of techniques have been chosen using SPSS and LISREL for evolving a model showing hidden relationships between the indicators determining consumers'

knowledge, commitment, and general awareness are related with the attributes of green consciousness. The research employed a data collection protocol and a combination of multivariate techniques (Principal Component Analysis, Confirmatory Factor Analysis, and Structural Equation Modeling) for investigating the key indicators of consumers' knowledge, commitment, and general awareness enacting their green consciousness while making a choice for a green product against other comparative products.

The outcome of this research is a 15-indicator model in the form of a path diagram comprising the relationships between the indicators (of consumers' knowledge, commitment, and general awareness) and four domains of green consciousness (environmental consciousness, green appearance consciousness, reliability consciousness, and economic consciousness) as discovered in the data collected from four shopping malls in Athens. The final path diagram after conducting a series of reliability and validity tests is an optimum-fit model comprising accepted relations only. The path diagram presents influence of indicators on green consciousness of consumers. This is not explored earlier by researchers as they have considered green consciousness as one of the variables of green consumerism and not a complex combination of underlying latent variables.

The next chapter presents a theoretical review of green marketing, green consumer behavior, and product attributes influencing consumer choices of green products.

## 2. Theoretical review

### 2.1. Green products, green marketing, and green consumerism

Green products have evolved as a result of the growing concerns about global and local pollution levels, global warming, diminishing natural reserves, and overflowing of wastes (Srivastava, 2007). The concept is found initially in the fields of green manufacturing and green procurement, but is now evident in all the echelons of supply chains (Srivastava, 2007). In modern supply chains, consumers are considered as an integral part of the chains and hence the concept of green consumerism has evolved as a result of downstream information flow through marketing channels (Srivastava, 2007). Green standards, technologies, and practices in supply chains have benefitted consumers in many ways (Azevedo et al., 2011).

The green products have been proven to have reduced harmful side effects, reduced hazards, reduced toxic substances, reduced health issues, improved recyclability, and improved environmental friendliness (Azevedo et al., 2011). Over a period, the economic gains could also be realized because of these benefits to consumers (Azevedo et al., 2011). For example, improved recyclability helps in reducing waste disposal costs (Azevedo et al., 2011).

The true gains from a green product come from its lifecycle benefits (Kaiser et al., 2001). Many environmental impacts are caused by using natural resources in massive quantities, hazardous methods of manufacturing, harmful ways of usage, harmful patterns of generation of wastes, and harmful patterns of disposal (Kaiser et al., 2001). A green product may be costlier than other comparative products but may have lower lifecycle costs (Steen, 2005). For example, the product may be recyclable easily causing little negative impacts on the environment (Kaiser et al., 2001).

Steen (2005) proposed a methodology of rough risk estimation and its cost to environment pertaining to each life cycle stage of a green product. The European Commission (2007) recommendations on green public procurement suggest investigating lifecycle benefits and costs of all processes followed to produce a product (life cycle analysis). These recommendations can be followed by

procurement specialists. However, individual consumers cannot make such deeper investigations about a product. Hence, they will need to trust the information available in green labels and environmental certifications displayed on the products.

Green labeling (eco-labeling) is another highly researched area in the field of green consumerism. Green labeling is a method to display the green benefits and certifications assigned to a green product tangibly in an enclosed specifications sheet, an enclosed brochure, or on the package itself (European Commission, 2007). European Commission (2007) categorizes green labels as EU eco-labels (sponsored by member states as per EC guidelines), international eco-labels (government sponsored), and privately sponsored eco-labels. European Commission (2007) states the responsibility of an eco-label sponsor is to set green standards and verify compliance of producers as per the standards.

In a research by Xu et al. (2012) in China, it was found that green labels (eco-labels) are significant enablers for consumers willing to pay more for green products. It happens in three stages. In stage 1, the customer should be informed about the green labels (and the certifications indicated on them). In stage 2, the customer weighs various benefits and is influenced by various variables (like, demographics, price sensitivity, income, shopping need, etc.) while making a decision. In stage 3, the consumer makes a purchase decision. Stage 1 is related to green information and labeling knowledge only.

Akenji (2014) argues that while EC directives and similar directives issued by many countries have an intention to enforce sustainability in production processes and the products, the definitions and standards are still unclear to both green sponsors and green producers. Hence, consumers are not getting clear information about how they should differentiate green from non-green products. This may not be true for all products. Some products do have clear guidelines about their contribution to sustainability. This means that the guidelines should be specific to products. The EC guidelines for product wise green procurement issued in 2007 (European Commission, 2007) is a good beginning. However, it only covers public procurements can be used more effectively by procurement professionals than general purchasers. In absence of clear guidelines and usable information, there is a chance that some of the producers may be using consumers as scapegoats. End of the day, if they use their green labels as marketing tools only, consumer scapegoatism cannot be ruled out.

Rex and Baumann (2007) raised the concern that it is hard to find independent research on validity and performance of green labels. Hence, there may be gaps between consumers' expectations from green products versus what they actually get. Rex and Baumann (2007) asserted that green labels should be used as policy enforcement and communication instruments and not merely as tools for increasing sales. Green markets are definitely evolving and green consumption is currently a priority in Europe and many other regions and countries. It has many advantages as reviewed in the next paragraph.

Sustainable (green) consumption helps in improving quality of life from the perspectives of reduced environmental concerns, improved economic growth, improved safety, improved community development and employment, equitable distribution of natural resources, improved well being, healthy lifestyles, and social responsibility (Kilbourne et al., 1997). The context of green consumption is both sociological and personal given that the consumer needs to consider enhancements in self-lifestyle and of lifestyles of others in the community (Spaargaren, 2003). Therefore, the green products should offer improved economic benefits, reduced negative environmental impacts, and reduced negative health and lifestyle impacts (Ottman, 2008). The CFL bulb is a good example of a green product that can cut electricity bills significantly, operate in

a significantly less hazardous way, and generate good luminance with almost heating (Ottman, 2008).

Peattie and Crane (2005: p. 360–364) warned that green products should be developed through genuine ecological innovation with right demonstration of its green benefits and value propositions to end customers. They highlighted the issues of green marketing for short-term profits, green labeling for compliance only, positioning green products without researching green consumption behaviors, and positioning products that have been criticized in the past for environmental and safety hazards (Peattie and Crane, 2005).

Peattie and Crane (2005: p. 364–365) concluded that green product development and marketing should start with the knowledge, beliefs, attitudes, needs, and wants of the green consumers, should be done with a long-term perspective in mind, should be done with full management commitment of company resources, and should be innovative. The green products and their marketing strategy should be designed based on actual consumer consumption patterns and consumer segmentation done in accordance with them (Ginsberg, 2004). This involves development of 4Ps of marketing separately for green products keeping in mind the knowledge, attitudes, and beliefs about green benefits, and needs and wants of green consumers (Banyte, Brazioniene and Gadeikiene, 2010b; Prakash, 2002).

It is apparent that green consumerism is a major subject for researching to support strategy formulation for green product development and marketing. The next section presents a review of consumer behaviors while choosing green products.

## 2.2. Key attributes influencing consumers' choice of green products

Marketers need to consider green market as a niche market and green consumers as a niche segment (Andrews and DeVault, 2009). Green products emerging because of regulations cannot be positioned for the niche green market unless they are positioned as per the knowledge, attitudes, and beliefs about green benefits, and needs and wants of green consumers (Andrews and DeVault, 2009; Banyte, Brazioniene and Gadeikiene, 2010b; Prakash, 2002). Such products can only be positioned for responsible consumerism, but it is only a part of the consumer behaviors while choosing green products (Andrews and DeVault, 2009). Consumers view green products as positioned against perceived dirty products (Kaufman, 2013). For example, the CFLs are viewed as positioned against solenoid-operated tube lights and filament-type bulbs (Ottman, 2008). The consumers primarily focus on financial incentives and environmental protection claims, and success stories of a product pertaining to these two attributes (Kaufman, 2013).

The key influencers of consumers' selection of a green product are purchase price benefits, operating price benefits (like, reduced electricity bills), green promotions, green features of the product, and environmental awareness related to the particular product (Boztepe, 2012; Thøgersen et al., 2012). Consumers trust green labeling as an indicator of green features in the product that they otherwise might have known through some research and study (Thøgersen et al., 2012). Consumers are ready to pay a premium for a product marked with credible green labeling provided they understand clearly the economic and ecological benefits of the product and are able to trace these benefits to tangible evidences (Owusu and Anifori, 2013; Xia and Zeng, 2006; Xu et al., 2012). Given their lack of knowledge and understanding of the traces of sources of green benefits, most of the consumers tend to trust their own consciousness about health and environment, and the certifications and labeling of the product constituents in making decisions for purchasing (Kai et al., 2013). Therefore, consumers tend to mix their green knowledge and attitudes with green brand

awareness while choosing a green product (Matthes et al., 2013; Zhao et al., 2014).

There is another dimension of consumer buying behaviors while choosing green products. A research carried out on 4000 respondents from Denmark, Italy, UK, and Germany revealed that consumers strongly and consistently value common benefits of green products in addition to their selfish benefits (Thøgersen, 2011). Consumers are aware of the problems of depleting natural resources, non-equitable distribution, global warming, pollution, health hazards of junk and poisoned foods, and such other common problems and consider them while making purchase decisions of green products, although the spending depends upon their level of loyalty towards green commitment (Banyte, Brazioniene and Gadeikiene, 2010a; Schlegelmilch et al., 1996; Young et al., 2010). Consumers look forward to trustworthiness, reference groups (of other green consumers), and personal efficacy of doing something for collective benefits for the communities where they live (Gupta and Ogden, 2009).

This study presents a construct of indicators related with consumer's knowledge, commitment, and general awareness of consumers and their influence on chosen latent indicators of consumers' green consciousness while choosing green products. In this context, the initial measurement model has been constructed based on the reviews in the next section.

## 2.3. Designing the initial measurement model based on literature inputs

In this section, an initial model design is presented for beginning the modeling process using a combination of techniques chosen in Section 3 (Research Methods).

Two research studies by Haws et al. (2013) and Tseng and Hung (2013) are chosen as benchmarks for the methodology chosen in this research. These research studies have established multivariate models using path analysis technique for presenting consumer behaviors while choosing green products. Tseng and Hung (2013: p. 180–182) presented an 11-factor construct for determining three latent indicators of consumers' behavior while choosing green products, named as tangibility, assurance, and reliability.

The standardized loadings after completing confirmatory factor analysis varied between .73 and .95, and the Cronbach Alpha values varied from .725 to .770 indicating high reliability of the factors chosen for constructing the three latent indicators. The indicators for tangibility discovered were clear ingredients, clear eco-labels, nice and clean appearances, and user-friendly information. The indicators for assurance discovered were non-polluting ingredients, recyclability of the product, high-energy conservation, and recyclability of the packaging. The indicators for reliability discovered were green functional performance, compliance with standards, and good durability.

The research by Haws et al. (2013: 4–6) comprised of formulation of a green scale for judging consumer buying behaviors. For a positive orientation in choosing the green products, the key latent indicators discovered in this research were environment commitment, awareness of influence of individual decisions on environment, green purchase habits, concerned about reducing wastage, and concerned about unfriendly actions to environment taken by others. Each of these indicators was determined by large number of factors (varying from 26 to 40). The Cronbach Alpha value of the scales of these latent indicators varied from .64 to .94. This study achieved more than .95 while testing goodness of fitment, comparative fit index, and normed fit index.

The key latent determinants of green consciousness while choosing green products studied in this research are environmental consciousness, economic consciousness, reliability consciousness,

and green appearance consciousness. The latent variables tangibility and reliability in the model of greenness by Tseng and Hung (2013) have been adopted as green appearance consciousness and reliability consciousness, respectively, in this research. The variable assurance has been split into environmental consciousness and economic consciousness, as per the research by Haws et al. (2013). The term consciousness has been added to the variables because this study is focused on the drivers of consumers' consciousness about greenness of the products while they make purchase decisions.

Boztepe (2012) described environmental consciousness as a function of knowledge of environmental problems, knowledge of environmental solutions, and knowledge of environmental benefits from specific green products. Schlegelmilch (1996) rated environmental knowledge and environmental protection attitudes as the most influencing variables on environmental consciousness. Thøgersen (2011) and Thøgersen et al. (2012) rated environmental commitment as the highest enabler of environmental consciousness. Their research highlighted that most consumers buy green products for selfish reasons only and hence mere environmental knowledge is insufficient to foster green consumerism. Economic consciousness is modeled as a function of value consciousness, price consciousness, multiple usage, and creative reuse in the research by Haws et al. (2013).

The variables are coded before constructing the initial model. The coding designed for the latent variables are shown below:

ENV-C → Environmental consciousness.

ECO-C → Economic consciousness.

REL-C → Reliability consciousness.

GA-C → Green appearance consciousness.

The indicator variables have been taken from the research studies by Haws et al. (2013), Tseng and Hung (2013), Boztepe (2012), Thøgersen (2011), Thøgersen et al. (2012), Banyte, Brazioniene and Gadeikiene (2010a), Kai et al. (2013), Schlegelmilch (1996), and Young et al. (2010). There are three key reasons for selecting these studies as the benchmark for the initial measurement model:

- (a) All these studies are focused on variables related to green consciousness of consumers willing to pay for green products.
- (b) Except the study by Banyte et al. (2010a) and Young et al. (2010), all these studies have used multivariate methods and focused on interconnecting the variables.
- (c) The studies have arrived at varying conclusions thus eliminating bias from the benchmark of this research. For example, Tseng and Hung (2013), Boztepe (2012), and Schlegelmilch (1996) have concluded environmental protection knowledge to be the key influencer of green consciousness whereas Thøgersen (2011) and Thøgersen et al. (2012) have concluded environmental commitment as the key enabler of green consciousness. Thøgersen (2011) and Thøgersen et al. (2012) argued that the consumers may be buying products for selfish reason if they only have environmental protection knowledge and are not committed to it.
- (d) The research studies by Haws et al. (2013) and Tseng and Hung (2013) have been used as methodological inputs to this research in addition to the variables modeled by them. These research studies have employed the combination of PCA, CFA, and SEM used in this research.

The indicator variables are as listed below:

- (a) Knowledge of environmental issues (KOEI)
- (b) Knowledge of environmental solutions (KOES)

- (c) Knowledge of ecological (green) labeling (KOEL)
- (d) Knowledge of environmental benefits (KOVB)
- (e) Knowledge of economic benefits (KOEB)
- (f) Commitment to environmental protection (CTEP)
- (g) Commitment to wastage reduction (CTWR)
- (h) Commitment to cost reduction (CTCR)
- (i) Commitment to health benefits (CTHB)
- (j) Presence of ecological labels (POEL)
- (k) Presence of environmental certification (POEC)
- (l) Presence of non-polluting ingredients (PONI)
- (m) Presence of recyclable packaging (PORP)
- (n) Opportunity for cost reduction (OFCR)
- (o) Nice and clean appearance (NACA)

The initial measurement model assumes all-to-all relationships among the factors and the latent variables, as shown in Fig. 1. This model has been used as the initial model in order to use Principal Component Analysis for deriving the optimum relationships. A reduced model is obtained through Principal Component Analysis and Scale Reliability testing such that the relationships to be tested for validity are derived. The variables have been interrelated in the following hypotheses tested through the cascaded process steps of Principal Component Analysis, Scale Reliability testing, Confirmatory Factor Analysis, and Structural Equation Modeling:

**H1.** Knowledge of environmental issues, solutions, and benefits, and commitment to environment are related positively with environmental consciousness.

**H2.** Knowledge of environmental issues and consciousness of presence of ecological labels and certification are related positively to green appearance consciousness.

**H3.** Consciousness of presence of non-polluting ingredients and recyclable packaging are related positively to reliability consciousness.

**H4.** Commitment to cost and wastage reduction is related positively to economic consciousness.

The four hypotheses have been developed to explore correlations between the four dimensions of green consciousness and their indicators. Some of these correlations are studied by existing researchers. However, this research brings all the four and their indicators under the purview of a single integrated model. The researcher expected that the model would reveal something more than merely proving or disproving these hypotheses.

The next chapter presents a description of the data collection protocol and the choice of a combination of techniques used to refine the initial measurement model designed in this section. The techniques have been chosen carefully to formulate a series of steps executed in SPSS and LISREL for testing reliability and validity of the model and refining it accordingly.

### 3. Research methods

The primary data is collected from 253 respondents chosen from regular green shoppers in four shopping malls in Athens (after rejecting incompletely filled cards). The shoppers have been approached through the payment terminals of four supermarkets situated within the malls and data has been collected over a period of one week through the counters where the shoppers assemble to pay the bills. A rating card is presented to the buyer when he or she chooses three or more food products with green attributes and approaches the counters for billing. In this manner, a total of 253 respondents have filled their responses in the rating card provided to them. The sample of the rating card is presented in Table 1. The

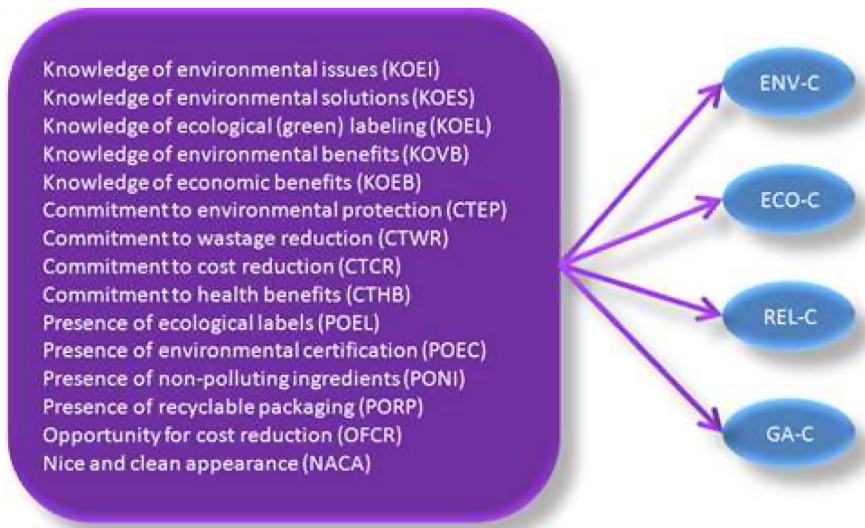


Fig. 1. The initial measurement model.

data on personal details were not collected due to restrictions on personal data collection in Greece. The personal data is not essential because this research is focused on factors influencing consumer decision-making while choosing green products without any categorization by age, gender, or demographics.

The data collected from the respondents have been entered in SPSS and the exploratory factor analysis technique is used employing Principal Component Analysis of a rotated solution using VARIMAX and Kaiser's normalization (Rencher, 2002). The rotated solution helped in mapping these 15 indicator variables with the four latent variables determining consumer behavior while choosing green products. The scales of each latent variable (comprising of the mapped indicator variables) have been tested using Cronbach Alpha method (Hair et al., 2009). The Cronbach Alpha threshold is taken as .6 as recommended for survey-based social research studies (Hair et al., 2009).

The resulting model presents the path diagram to be validated through confirmatory factor analysis (CFA) and structural equation

modeling (SEM) validity tests in LISREL 8 (Hair et al., 2009). The key measures chosen in the CFA validity test are Chi-Square, degrees of freedom, root mean square error of approximation (RMSEA), root mean square residual (RMR), standardized root mean square residual (RMR), and goodness of fitment (GFI) (Hair et al., 2009). The ratio of chi-square to degrees of freedom should be less than or equal to 3.0, and RMSEA, RMR, and SRMR values should be closest to zero (Hair et al., 2009). The key measures in the SEM validity test are normed fitment index (NFI), non-normed fitment index (NNFI), comparative fitment index (CFI), relative fit index (RFI), and incremental fitment index (IFI) (Hair et al., 2009). The values of GFI and all the measures of SEM should be equal to or greater than .9 for a good fitment of the path diagram (Hair et al., 2009).

It should be noted that the SEM measures are compared against a best fitment model estimated by LISREL internally (Hair et al., 2009). LISREL recommends changes in path relationships and error variances for making the path diagram closest to the best fitment path diagram (Byrne, 1998). However, the researcher

**Table 1**  
Rating card filled by each respondent. This rating card is to know about the indicators influencing your choice of green products for a research purpose. Kindly mark the most appropriate choice as applicable to your decision-making for purchasing green products.

| S. No. | Questions   | Please tick at one rating level – 5 is the highest and 1 is the lowest |   |   |   |   |
|--------|---|--|---|---|---|---|
|        |   | 1  | 2 | 3 | 4 | 5 |
| 1      | Please rate your knowledge of environmental issues.   |  |   |   |   |   |
| 2      | Please rate your knowledge of environmental solutions.  |  |   |   |   |   |
| 3      | Please rate your knowledge of ecological (green) labeling/standards.                                |  |   |   |   |   |
| 4      | Please rate your knowledge of environmental benefits of green products.                             |  |   |   |   |   |
| 5      | Please rate your knowledge of economic benefits of green products.                                  |  |   |   |   |   |
| 6      | Please rate your Commitment to environmental protection.  |  |   |   |   |   |
| 7      | Please rate your Commitment to wastage reduction.   |  |   |   |   |   |
| 8      | Please rate your Commitment to cost reduction.  |  |   |   |   |   |
| 9      | Please rate your Commitment to health benefits.   |  |   |   |   |   |
| 10     | Please rate your consciousness about Presence of ecological labels in the green products.           |  |   |   |   |   |
| 11     | Please rate your consciousness about Presence of environmental certification of the green products. |  |   |   |   |   |
| 12     | Please rate your consciousness about Presence of non-polluting ingredients in the green products.   |  |   |   |   |   |
| 13     | Please rate your consciousness about Presence of recyclable packaging of the green products.        |  |   |   |   |   |
| 14     | Please rate your consciousness about Opportunity for cost reduction using the green products.       |  |   |   |   |   |
| 15     | Please rate your consciousness about Nice and clean appearance of the green products.               |  |   |   |   |   |

should accept the changes carefully by looking into theoretical validity (also called content validity) (Byrne, 1998). This means that both content and construct validity should be matched before finalizing the path diagram (Byrne, 1998).

#### 4. Results and findings

The data set collected ( $N = 253$ ) using the rating card is found to be non-normal because the P-values are less than  $P = 0.05$  at 95% confidence interval. Therefore, this data can be tested using non-parametric tests only. The rotated solution (VARIMAX rotation with Kaiser's normalization) obtained after Principal Component Analysis is presented in Table 2. The data set has four Eigen Values above unity and hence, four latent variables could be obtained. This finding is supportive to the initial measurement model because it has four latent variables, as well. The rotated solution resulted in distribution of the indicator variables among the four latent variables. A loading value of .6 has been taken as the threshold and the values higher than the threshold have been identified in Table 2 (bolded and underlined). These indicator variables represent the corresponding initial scales of the latent variables 1 to 4. The scales have been tested for their reliability using Cronbach Alpha testing.

The tool used for running the Cronbach Alpha test is SPSS (Statistical Package for Social Studies). The scale reliability of Latent Variable 1 is obtained as .973, which is significantly higher than the threshold value of .6. Moreover, it may be observed that deleting any indicator variable from the scale will not improve the Cronbach Alpha value. Hence, it is concluded that this scale is optimized and can be accepted as a measure for Latent Variable 1. Similar method has been used for testing scale reliabilities of Latent Variables 2, 3, and 4 and the results are presented in Tables 3–5.

The three Latent scales (for Latent Variables 2, 3, and 4) have been finalized with three indicator variables each, as presented in Tables 2, 4 and 5. These scales have been obtained after deleting an indicator variable each for Latent variables 2 and 3 causing increase in Cronbach Alpha values. In the case of Latent Variable 4, the indicator variable KOEI is retained in spite of a reflected increase in Cronbach Alpha if it is deleted. This is because its deletion was resulting in negative average covariances among the remaining two indicator variables. However, the scale for Latent Variable 4 is assumed to be reliable because the Cronbach Alpha value of .709 is still higher than the threshold value of .6.

**Table 2**  
Rotated component matrix obtained after Principal Component Analysis.

| Rotated component matrix |                   |                   |                   |                   |
|--------------------------|-------------------|-------------------|-------------------|-------------------|
|                          | Component         |                   |                   |                   |
|                          | Latent Variable 1 | Latent Variable 2 | Latent Variable 3 | Latent Variable 4 |
| KOEI                     | .096              | <b>.552</b>       | .025              | <b>.654</b>       |
| KOES                     | <b>.940</b>       | .007              | -.064             | .074              |
| KOEL                     | <b>.941</b>       | .063              | -.114             | .076              |
| KOVB                     | <b>.948</b>       | .042              | -.086             | .172              |
| KOEB                     | <b>.953</b>       | .021              | -.079             | .203              |
| CTEP                     | <b>.904</b>       | .002              | -.087             | .275              |
| CTWR                     | .506              | -.050             | .012              | <b>.696</b>       |
| CTCR                     | .554              | .050              | -.001             | <b>.700</b>       |
| CTHB                     | .022              | <b>.930</b>       | .116              | .094              |
| POEL                     | .021              | <b>.947</b>       | .121              | .048              |
| POEC                     | .022              | <b>.916</b>       | .144              | -.009             |
| PONI                     | .026              | .273              | <b>.804</b>       | -.137             |
| PORP                     | -.064             | .173              | <b>.894</b>       | -.089             |
| OFCR                     | -.066             | .014              | <b>.906</b>       | .062              |
| NACA                     | -.220             | -.004             | <b>.766</b>       | .170              |

Extraction Method: Principal Component Analysis.  
Rotation Method: VARIMAX with Kaiser Normalization.  
Rotation converged in 4 iterations.

**Table 3**  
Scale reliability test results for Latent Variable 1.

| Reliability statistics |                            |                                |                                  |                                |
|------------------------|----------------------------|--------------------------------|----------------------------------|--------------------------------|
|                        | Cronbach Alpha             |                                | N of items                       |                                |
|                        | .973                       |                                | 5                                |                                |
| Item-total statistics  |                            |                                |                                  |                                |
|                        | Scale mean if item deleted | Scale Variance if item deleted | Corrected item-total correlation | Cronbach Alpha if item deleted |
| KOES                   | 12.5059                    | 28.116                         | .915                             | .971                           |
| KOEL                   | 12.2451                    | 25.360                         | .919                             | .966                           |
| KOVB                   | 12.4229                    | 24.547                         | .949                             | .962                           |
| KOEB                   | 11.5534                    | 25.431                         | .970                             | .959                           |
| CTEP                   | 12.1423                    | 23.083                         | .911                             | .972                           |

**Table 4**  
Scale reliability test results for Latent Variable 2.

| Reliability statistics |                            |                                |                                  |                                |
|------------------------|----------------------------|--------------------------------|----------------------------------|--------------------------------|
|                        | Cronbach Alpha             |                                | N of items                       |                                |
|                        | .912                       |                                | 3                                |                                |
| Item-total statistics  |                            |                                |                                  |                                |
|                        | Scale mean if item deleted | Scale Variance if item deleted | Corrected item-total correlation | Cronbach Alpha if item deleted |
| CTHB                   | 6.6443                     | 7.548                          | .873                             | .912                           |
| POEL                   | 6.1581                     | 5.459                          | .904                             | .806                           |
| POEC                   | 6.5336                     | 4.051                          | .876                             | .893                           |

In Table 3, the scale reliability test results of latent variable 1 (realized as ENV-C later in this section) are presented. The Cronbach Alpha change with an item deleted did not reflect an increase beyond the overall Cronbach Alpha of the scale. Thus, none of the items in this scale has been deleted.

In Table 4, the scale reliability test results of latent variable 2 (interpreted as GA-C later in this section) are presented. In this scale as well, none of the items has been deleted because the Cronbach Alpha change with an item deleted did not reflect an increase beyond the overall Cronbach Alpha of the scale.

Tables 5 and 6 present scale reliability test results of latent variable 3 (interpreted as REL-C later in this section) and latent variable 4 (interpreted as ECO-C later in this section). In both the scales as well, none of the items has been deleted because of the same reason.

Before drawing the path diagram, a theoretical mapping between the four latent variables obtained from the rotated factor table and the four latent variables of the initial measurement model is conducted. The variables loading Latent Variable 1 clearly indicate that it is the ENV-C (environmental consciousness). The Latent Variable 2 is loaded by commitment to health benefits, consciousness about presence of ecological labels, and consciousness about presence of environmental certification. It is interpreted that the most appropriate match for this Latent Variable 2 is GA-C (green appearance consciousness) because the labels and certifications are displayed on the product package and can be viewed as determinants of green appearance of the product. There is no other way that a customer can judge greenness of a product by simply looking at its appearance.

The Latent Variable 3 is loaded by consciousness about presence of non-polluting ingredients, presence of recyclable packaging, and opportunity for cost reduction. These attributes determine the

**Table 5**  
Scale reliability test results for Latent Variable 3.

| Reliability statistics |                                  |                                      |  |                                      |
|------------------------|----------------------------------|--------------------------------------|--|--------------------------------------|
| Cronbach Alpha         | N of items                       |                                      |  |                                      |
| .883                   | 3                                |                                      |  |                                      |
| Item-total statistics  |                                  |                                      |  |                                      |
|                        | Scale mean<br>if item<br>deleted | Scale Variance<br>if item<br>deleted | Corrected<br>item-total<br>correlation | Cronbach<br>Alpha if<br>item deleted |
| PONI                   | 5.9526                           | 7.014                                | .731                                   | .872                                 |
| PORP                   | 5.9249                           | 6.387                                | .856                                   | .760                                 |
| OFCR                   | 6.3518                           | 6.911                                | .738                                   | .866                                 |

green performance of the green product and hence the most suitable match for Latent Variable 3 is REL-C (reliability consciousness). The Latent Variable 4 is loaded by knowledge of environmental issues, commitment to wastage reduction, and commitment to cost reduction. Reducing wastage and cost are determinants of economic benefits of a green product. Hence, the most suitable match for Latent Variable 4 is ECO-C (economic consciousness).

A path diagram is created in LISREL 8 (academic edition) and the enhancements recommended by LISREL for making the model closest to the best fitment model are implemented. The model equations and the recommended enhancements (in the form of freeing error covariances as reported by LISREL) programmed in LISREL are shown in Table 7. It may be observed that a new relationship between KOEI and GA-C is added on recommendation by LISREL output file. The model fitment statistics and correlations among the latent variables are shown in Table 7, as well. The model fitment statistics achieved after LISREL-recommended enhancements indicate good model fitment. However, the inter-relationships among the latent variables reflect high correlation (.72) between ECO-C and ENV-C only.

The ratio of Chi-square to degrees of freedom is 2.628, which is less than three. The values of RMSEA, RMR, and SRMR are quite close to zero. The values of GFI, NFI, NNFI, CFI, RFI, and IFI are all above .9. Hence, the validated path diagram (presented in Fig. 2) indicates a good model fitment.

There were some Heywood cases in the model reflecting loading coefficients more than unity. Loadings in Heywood cases can be solved by either fixing them to 1 or adding error covariances. The researcher decided to fix them to 1 as they are not significantly higher than 1 and there are no negative covariances against them (Boomsma, 2001; Chen et al., 2001).

The final results of this research comprising indicators to latent variables mapping based on the best fitment model are tabulated in Table 8.

The results of this research have proposed that green consumers are conscious about environmental benefits, economic benefits,

**Table 6**  
Scale reliability test results for Latent Variable 4.

| Reliability statistics |                                  |   |  |                                      |
|------------------------|----------------------------------|---|--|--------------------------------------|
| Cronbach Alpha         | N of items                       |   |  |                                      |
| .709                   | 3                                |   |  |                                      |
| Item-total statistics  |                                  |   |  |                                      |
|                        | Scale mean<br>if item<br>Deleted | Scale<br>Variance<br>if item<br>Deleted | Corrected<br>item-total<br>correlation | Cronbach<br>Alpha if<br>item Deleted |
| KOEI                   | 6.0830                           | 3.997                                   | .409                                   | .751                                 |
| CTWR                   | 5.9842                           | 2.008                                   | .571                                   | .656                                 |
| CTCR                   | 6.0830                           | 3.180                                   | .737                                   | .430                                 |

green reliability, and green appearance of the product. The consumers choose a green product based on these four consciousness parameters. Their knowledge of environmental protection, solutions to environmental issues, green labeling, and economic benefits synergize with their commitment to environmental protection to make them conscious about environmental benefits of a product. The level of knowledge may vary but their commitment to environment acts as an enabler.

Green consumerism is firmly founded on environmental and social beliefs, attitudes, and values (functional, social, and environmental) (Schaefer and Crane, 2005; Lin and Huang, 2012). Green consumers attach the criteria of price, convenience, and quality pertaining to environmental and social benefits on the top of the conventional considerations that any regular consumer will attach to these criteria (Schaefer and Crane, 2005). They are ready to pay the premium if these criteria are fulfilled and they have an estimation of economics of eco-friendliness in the long-run (Schaefer and Crane, 2005). Assessment of price, convenience, and quality criteria is a function of intrinsic knowledge of consumers about the variables influencing them (Schlegelmilch et al., 1996). The consciousness of the consumers about economic benefits is driven by their commitment to reduce cost and wastage, and their knowledge about how these reductions can solve the known environmental issues (Nyborg et al., 2003; Akenji, 2014).

The consciousness of the consumers about green reliability is driven by their consciousness about non-polluting ingredients, opportunities for reducing costs (incurred in using the product), and presence of recyclable packaging (Tseng and Hung, 2013; Palevich, 2012). As per the results of this research, the consumers view these attributes as determinants of green performance of the product. The research by Tseng and Hung (2013) and Palevich (2012) found these parameters as determinants of green assurance. Hence, it appears that consumers expect assurance of reliability by assessing these factors in the green products.

Finally, the consciousness of the consumers about green appearance is driven by their consciousness of presence of ecological labels and certifications, their knowledge of environmental issues, and their commitment to health benefits of the green product. The factor "health benefits" is highlighted in this research because the household products in the chosen group were primarily food and beverages. Tseng and Hung (2013), Peattie and Charter (2003), Ferrell and Hartline (2011), Peattie and Crane (2005), and Thøgersen et al. (2012) found consciousness of presence of ecological labels and certifications as a measure of green reliability of the product.

In addition, Owusu and Anifori (2013), Xia and Zeng (2006), Xu et al. (2012) and Zhao et al. (2014) considered green labeling and consciousness of economic and ecological benefits of the product as way of green reliability and green performance checking of the product. These scholars also suggested that consumers estimate green reliability throughout the life cycle of the product in terms of economics, sustainable benefits during usage, and recycling. This research presents a new dimension that consumers consider green labeling and green certification as a measure of green appearance of the product, which in turn they treat as a measure of green reliability of the product.

The consumers gather required information from green labeling, published product literature, and articles (Schlegelmilch et al., 1996; Sammer and Wustenhagen, 2006; Borin and Cerf, 2011). However, it is not clear how the consumers evaluate green labels and the other information sources for making product choices (Brecard, 2013; Akenji, 2014). Scholars like Akenji (2014), Brecard (2013), and Thøgersen (2011), and Gupta and Ogden (2009) have raised the point about "extent of balance" between selfish good and common good among green buyers using relevant information for



**Table 7**

Path diagram relationships programmed in LISREL including the recommendations of freeing error covariances for making the model closest to the internal best fitment model.

| Path diagram relationships after including recommendations by LISREL for best fitment |       |       |       |       |
|---|-------|-------|-------|-------|
| Sample Size = 253   |       |       |       |       |
| Latent Variables ENVC ECOC RELC GAC   |       |       |       |       |
| Relationships   |       |       |       |       |
| KOEI = ECOC GAC   |       |       |       |       |
| KOES = ENVC   |       |       |       |       |
| KOEL = ENVC   |       |       |       |       |
| KOVB = ENVC   |       |       |       |       |
| KOEI = ENVC   |       |       |       |       |
| CTEP = ENVC   |       |       |       |       |
| CTWR = ECOC   |       |       |       |       |
| CTCR = ECOC   |       |       |       |       |
| CTHB = GAC  |       |       |       |       |
| POEL = GAC  |       |       |       |       |
| POEC = GAC  |       |       |       |       |
| PONI = RELC   |       |       |       |       |
| PORP = RELC   |       |       |       |       |
| OFCR = RELC   |       |       |       |       |
| Set the Variance of ENVC to 1.00  |       |       |       |       |
| Set the Variance of ECOC to 1.00  |       |       |       |       |
| Set the Variance of RELC to 1.00  |       |       |       |       |
| Set the Variance of GAC to 1.00   |       |       |       |       |
| Set the Error Covariance of CTEP and KOEL Free  |       |       |       |       |
| Set the Error Covariance of CTEP and KOEB Free  |       |       |       |       |
| Set the Error Covariance of CTWR and KOEL Free  |       |       |       |       |
| Set the Error Covariance of CTWR and CTEP Free  |       |       |       |       |
| Path Diagram  |       |       |       |       |
| Iterations = 500  |       |       |       |       |
| End of Problem  |       |       |       |       |
| Degrees of Freedom = 66   |       |       |       |       |
| Normal Theory Weighted Least Squares Chi-Square = 173.47 (P = 0.00)                   |       |       |       |       |
| Root Mean Square Error of Approximation (RMSEA) = 0.080                               |       |       |       |       |
| Normed Fit Index (NFI) = 0.96   |       |       |       |       |
| Non-Normed Fit Index (NNFI) = 0.96  |       |       |       |       |
| Comparative Fit Index (CFI) = 0.97  |       |       |       |       |
| Incremental Fit Index (IFI) = 0.97  |       |       |       |       |
| Relative Fit Index (RFI) = 0.94   |       |       |       |       |
| Root Mean Square Residual (RMR) = 0.075   |       |       |       |       |
| Standardized RMR = 0.046  |       |       |       |       |
| Goodness of Fit Index (GFI) = 0.91  |       |       |       |       |
| Note: loadings in Heywood cases fixed to 1  |       |       |       |       |
|   | ENVC  | ECOC  | RELC  | GAC   |
|   | ----- | ----- | ----- | ----- |
| ENVC  | 1.00  |       |       |       |
| ECOC  | 0.72  | 1.00  |       |       |
| RELC  | -0.17 | -0.08 | 1.00  |       |
| GAC   | 0.04  | 0.10  | 0.28  | 1.00  |

striking such a balance. For example, there may be an unknown trend that consumers are concerned more about power savings data than recyclability data while purchasing an electrical or electronics appliance.

This perspective of green decision-making among green consumers is not studied adequately. There is a need for evolving cognitive models showing usage of data collected from green labels and other information sources for making green purchase decisions. This enquiry is needed for getting deep into consumers' pattern of decision-making after they have collected information from these sources. Controlled field experimentation is needed for investigating the influence of green appearance consciousness on consumers' decision-making.

The above results reflect consistency with reflections from past theories. In addition to validity scores, consistent mapping with theoretical reflections reveal that the chosen group of techniques used to derive the model has been highly effective. VARIMAX

rotation with Kaiser Normalization is just one of the rotation methods in Principal Component analysis that was chosen for modeling. It proved to be very useful given that the rotated model is quite close to the final model tested with multiple validity tests. The choice of Cronbach Alpha split-half test, RMSEA, RMR, SRMR, GFI, NFI, NNFI, CFI, and IFI metrics returned relevant validity scores. Most importantly, LISREL's internal recommendations on model improvements proved to be very useful in enhancing the validity scores returned from the tests. All the tests chosen are non-parametric because the data is not distributed normally. This is expected to happen in green consumerism research in future, as well. Future researchers may like to validate this fact.

A discussion on practical significance of the model is presented from this point forward. To understand the practical significance of the model, it has been simplified in the Fig. 3. The literature confirmed validity of individual relationships in this model. The overall structure of this model is a new theoretical evolution. The

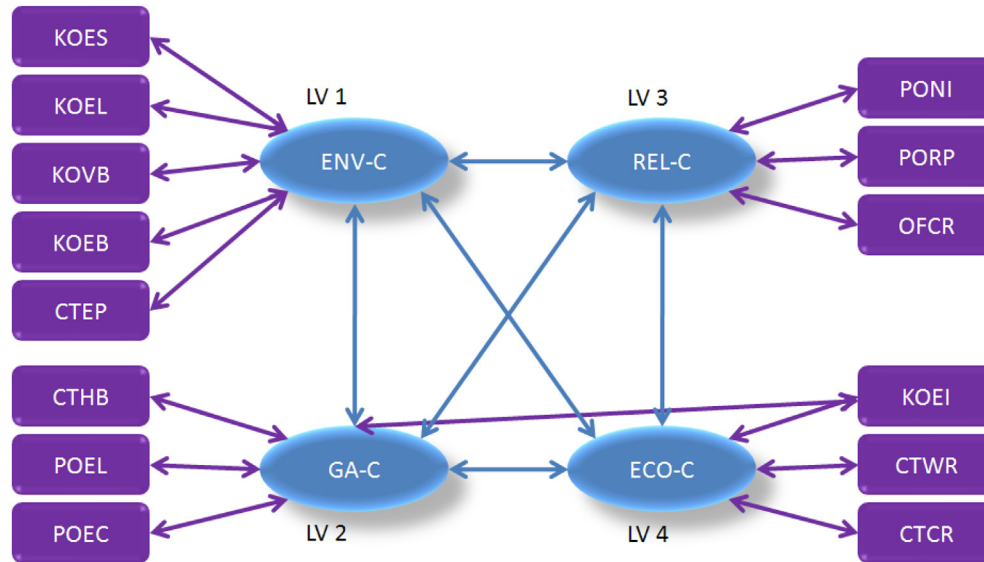


Fig. 2. The finalized rotated model after principal component analysis using VARIMAX rotation and Kaiser's normalization, and after CFA and SEM tests.

factors influencing the four consciousness domains (environmental, green appearance, economic, and reliability) are categorized under consciousness, knowledge, and commitment. Consciousness may be viewed as general awareness levels among the green buyers without deep understanding, knowledge may be viewed as deep understanding of a concept, and commitment may be viewed as a strong belief in decisions as they are supported by deep understanding of the concept. In this research, it is found that environmental consciousness is influenced by knowledge of environmental solutions, ecological (green) labeling, environmental benefits (of the product), and economic benefits of the product. The fifth factor contributing to environmental consciousness is commitment to environmental protection.

In the model by Haws et al. (2013), there are five factors contributing to environmental consciousness while buying products – consciousness about impact of products on environment, considering impacts of personal actions on environment, linking purchase habits with environmental protection, concerned about waste, commitment to environmental protection, and willing to be inconvenienced for taking environment friendly actions. Prima

facie, these factors reflect knowledge as well as commitment while deciding for purchases.

Comparing with the simplified model in Fig. 3, these factors jointly produce “environmental consciousness”. However, is environmental consciousness a necessary and sufficient condition for making purchase decisions of green products? The model in Fig. 3 responds negatively to this question because it shows four consciousness domains interacting with each other to influence a green purchase decision collectively. The model presented by Tseng and Hung (2013) shows that green product quality is essential for making green purchase decisions. Their model shows it as a function of tangibles, assurance, and reliability. Tangibles in this research are represented by “green appearance consciousness”, assurance may be viewed as collectively contributed by “environmental and economic consciousnesses”, and reliability is represented by “reliability consciousness”.

In the research by Tseng and Hung (2013), tangibles are influenced by clear information on product ingredients, eco-labeling, nice (overall) product appearance, and general assurance of user-friendliness. The first three factors are similar to the model in Fig. 3. Only the fourth factor (user-friendliness) is replaced by health benefits because this research was conducted on food products. However, the model of this research also differentiates between consciousness, knowledge, and commitment. The first three factors are under “consciousness” attribute and the last factor is under “commitment” attribute of this research. While other factors linked with the remaining consciousness domains are also matching the research by Tseng and Hung (2013), the unique contribution of this research is that it differentiates the factors under consciousness, knowledge, and commitment attributes.

This model also provides a partial answer to the concerns raised by Akenji (2014), Brecard (2013), and Thogersen (2011), and Gupta and Ogden (2009). Their research studies raised the question of selfishness versus selflessness among buyers while choosing green products. This model suggests that there might be a balance between these two emotions among customers when they make buying decisions. It might be possible that modern informed customers are well aware of the benefits of environmental protection in their personal lives. For example, knowledge of environmental issues collectively with commitment to cost and waste reduction contributes to their economic consciousness.

Table 8  
Final results of the research based on the best fitment model.

| S. No. | Customer behaviors while choosing green products (latent variables) | Indicators influencing the customer behaviors (factor variables)  |
|--------|---|---|
| 1      | Environmental consciousness   | Knowledge of environmental solutions<br>Knowledge of ecological (green) labeling<br>Knowledge of environmental benefits<br>Knowledge of economic benefits<br>Commitment to environmental protection |
| 2      | Green appearance consciousness                                      | Knowledge of environmental issues<br>Commitment to health benefits<br>Consciousness of presence of ecological labels<br>Consciousness of presence of environmental certification                    |
| 3      | Reliability consciousness   | Consciousness of presence of recyclable packaging<br>Consciousness of opportunity for cost reduction<br>Consciousness of presence of non-polluting ingredients                                      |
| 4      | Economic consciousness  | Knowledge of environmental issues<br>Commitment to wastage reduction<br>Commitment to cost reduction  |

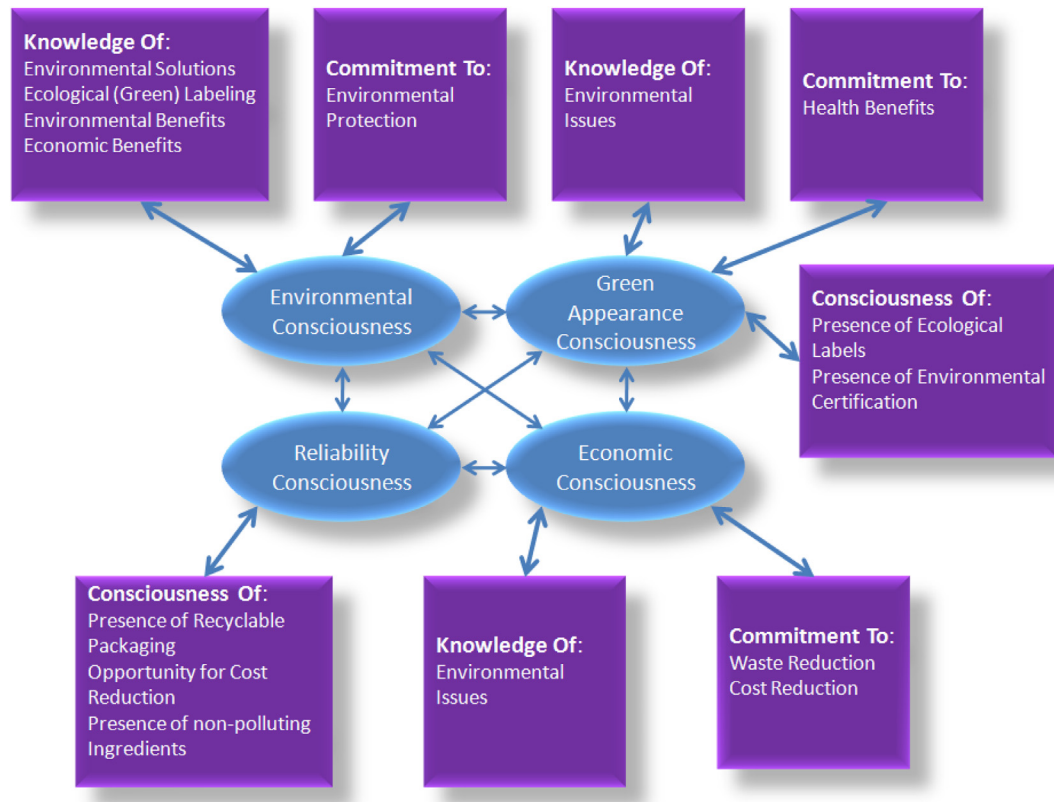


Fig. 3. A simplified structure of the model.

On the other hand, knowledge of economic and environmental benefits combined with commitment to environmental protection contributes to their environmental consciousness. This comparison reveals that regular green consumers do not distinguish between environmental and economic benefits. They see them as complimentary and in this process fulfill their personal needs as well as public commitment. There is no discounting of one commitment for the other one.

Finally, the possibility of consumer scapegoatism cannot be ruled out (a concern raised by Akenji, 2014). Consumers are relying solely on the green appearance (labeling and certifications) for information about the products and using their knowledge about environmental concerns to make a decision. This reveals that consumers may be disconnected from the actual system of sustainable production, which may be the cause of consumers' scapegoatism. The green sponsors setting green labeling standards and certifications should audit the producers' processes before allowing them to claim their greenness to the customers. If this is not followed due-diligently, consumers may not get the true green benefits they are expecting from the products.

There appears to be a complex interaction of consciousness, knowledge, and commitment in the minds of consumers when they assess green attributes of a product. When they visit a store, they apply their cognitive consciousness to assess the green product by its appearance and green labeling and apply their existing knowledge about environmental issues, solutions, labeling, and benefits of the products. Their four dimensions of consciousness (environmental, green appearance, economic, and reliability) interact with each other while they make a choice. Most importantly, there is a balancing act between their selflessness and selfishness. At one side, consumers are concerned about environmental protection and at the other side the consumers are concerned about economic benefits and reliability. A customer will

make a choice if they find the two sides complimentary and not conflicting.

A marketer cannot promote a green product by simply focusing on environmental benefits and not personal benefits of the consumers. The reverse is also true. In theory, the consumers appear to be selfish as they were in choosing non-green products. The incremental consideration evident is a function of their selfless consideration for the environment. However, a further study is needed to assess whether the premium paid by the green consumers is proportional to the extent of their selflessness.

These theoretical evolutions may be viewed as very early efforts for delving deep into cognitive mindsets of green consumers when they deal with green information and knowledge. More research is needed in this direction such that deeper frameworks of understanding behaviors and decision-making of green consumers could be established. There is a need for understanding the interactions among the four domains of consciousness further.

## 5. Conclusions and recommendations

The green consumers choose green products by virtue of their consciousness about environmental benefits, economic benefits, green reliability, and green appearance of the product. The results have also revealed that there is a high correlation between consumers' consciousness about environment and economic benefits of the green product. Hence, as per the results of a research conducted in Athens, the green consumers collectively consider the environmental and economic benefits while choosing a green product. Their consciousness about these two benefits, green reliability, and green appearance is driven by a number of indicators as found in this research and reviewed in Chapter 4.

A mapping with existing literature indicates that green appearance and green reliability might be the same thing from the perspective of the green consumers because they determine green reliability by looking into the product and assessing the labels (for green labeling and certifications), reading the ingredients, assessing the packaging, and analyzing the green performance of the products based on these assessments and their knowledge about environmental and economic benefits. They choose the green product based on a balanced analysis of the factors reported in this research. Overall, the four consciousness domains of environmental consciousness, green appearance consciousness, reliability consciousness, and economic consciousness interact with each other in a complex fashion in which, consciousness, knowledge, and commitment of green buyers in various combinations play their parts.

The findings of this research are highly significant for green product manufacturers and marketers. There is a possibility that not all green consumers may be considering all these variables. However, there is a definite possibility that green consumers may be considering a subset of these variables while making a purchase decision. Different consumers may be considering different subsets of the same set (of 15 factors) and hence the entire set is important for the marketers.

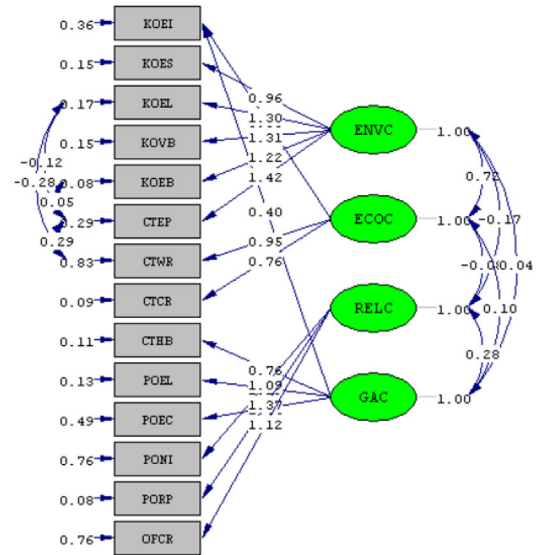
The marketing campaigns may comprise tangible details about all the factors influencing the four consciousness parameters of green consumers (environmental benefits, economic benefits, green reliability, and green appearance). It is also clear that the product appearance is a measure of green reliability of the product and hence, marketers should include all the information that the green consumers may be looking into before making a choice. For example, the marketer should include logos of green certifications, details of ingredients, a summary of green benefits (like low electricity consumption or low trans-fat diet), and a recyclable package.

The four consciousness domains can be related with fundamental psychology theories that are not investigated in this research. It is a complex science requiring further investigations. This research provides a model about how the four consciousness domains may interact. This research also presents about what constitutes the four consciousness domains as per results in Athens. However, this research does not investigate the sources of these four consciousness domains.

The future aspirants may like to test the model in different cities and countries collecting data using the instrument used in this research. In addition, the researchers in future may like to investigate the methods and information sources consumers may be using for gaining consciousness in these four domains. While there are many theories pertaining to reliability and economics consciousness as they are fundamental domains of consumerism in general, there is a lack of theories pertaining to consciousness in environmental and green appearance. How will consumers really trust the green labels, a green colored package, or certifications mentioned on the labels for perceiving the product to have green characteristics? What sources of information they are using in practice? What is the extent and depth to which, they make their analyses. These are few questions to be answered.

Finally, this research also emphasized about possibility of consumer scapegoatism as a result of the four consciousness domains not connected well with the overall information system of sustainability. There may be a possibility that consumers may be making purchase decisions based on superficial information they mostly see in advertisements or read in short articles. How many consumers deeply study the issue of sustainability and apply their in their purchasing decisions? This aspect needs further research and investigation, as well.

Appendix A



Chi-Square=173.47, df=66, P-value=0.00000, RMSEA=0.080

Path Diagram

Sample Size = 253  
 Latent Variables ENVC ECOC RELC GAC  
 Relationships  
 KOEI = ECOC GAC  
 KOES = ENVC  
 KOEL = ENVC  
 KOVB = ENVC  
 KOEB = ENVC  
 CTEP = ENVC  
 CTWR = ECOC  
 CTCR = ECOC  
 CTHB = GAC  
 POEL = GAC  
 POEC = GAC  
 PONI = RELC  
 PORP = RELC  
 OFCR = RELC  
 Set the Variance of ENVC to 1.00  
 Set the Variance of ECOC to 1.00  
 Set the Variance of RELC to 1.00  
 Set the Variance of GAC to 1.00  
 Set the Error Covariance of CTEP and KOEL Free  
 Set the Error Covariance of CTEP and KOEB Free  
 Set the Error Covariance of CTWR and KOEL Free  
 Set the Error Covariance of CTWR and CTEP Free  
 Path Diagram  
 Iterations = 500  
 End of Problem

Sample Size = 253

Path Diagram

Covariance Matrix

|      | KOEI | KOES  | KOEL  | KOVB  | KOEB  | CTEP  |
|------|------|-------|-------|-------|-------|-------|
| KOEI | 0.67 |       |       |       |       |       |
| KOES | 0.16 | 1.08  |       |       |       |       |
| KOEL | 0.25 | 1.24  | 1.73  |       |       |       |
| KOVB | 0.24 | 1.26  | 1.64  | 1.87  |       |       |
| KOEB | 0.24 | 1.16  | 1.51  | 1.61  | 1.57  |       |
| CTEP | 0.31 | 1.38  | 1.71  | 1.92  | 1.86  | 2.46  |
| CTWR | 0.34 | 0.69  | 0.75  | 1.06  | 1.06  | 1.51  |
| CTCR | 0.33 | 0.47  | 0.67  | 0.74  | 0.66  | 0.78  |
| CTHB | 0.37 | 0.04  | 0.07  | 0.08  | 0.04  | 0.06  |
| POEL | 0.52 | 0.02  | 0.10  | 0.12  | 0.07  | 0.04  |
| POEC | 0.54 | -0.01 | 0.08  | 0.08  | 0.07  | 0.06  |
| PONI | 0.14 | -0.13 | -0.14 | -0.13 | -0.11 | -0.19 |
| PORP | 0.08 | -0.19 | -0.32 | -0.30 | -0.27 | -0.34 |
| OFCR | 0.09 | -0.12 | -0.26 | -0.25 | -0.24 | -0.32 |

Covariance Matrix

|      | CTWR  | CTCR  | CTHB | POEL | POEC | PONI |
|------|-------|-------|------|------|------|------|
| CTWR | 1.82  |       |      |      |      |      |
| CTCR | 0.75  | 0.67  |      |      |      |      |
| CTHB | 0.07  | 0.07  | 0.70 |      |      |      |
| POEL | 0.04  | 0.10  | 0.90 | 1.54 |      |      |
| POEC | 0.05  | 0.08  | 1.10 | 1.72 | 2.56 |      |
| PONI | -0.11 | -0.03 | 0.35 | 0.57 | 0.75 | 1.96 |
| PORP | -0.12 | -0.09 | 0.31 | 0.43 | 0.60 | 1.50 |
| OFCR | -0.02 | 0.00  | 0.15 | 0.26 | 0.33 | 1.21 |

Covariance Matrix

|      | PORP | OFCR |
|------|------|------|
| PORP | 1.96 |      |
| OFCR | 1.53 | 2.00 |

Path Diagram

Number of Iterations = 13

LISREL Estimates (Maximum Likelihood)

Measurement Equations

KOEI = 0.35\*ECOC + 0.40\*GAC, Errorvar.= 0.36 , R<sup>2</sup> = 0.47  
 (0.043) (0.044) (0.034)  
 8.12 9.26 10.60

KOES = 0.96\*ENVC, Errorvar.= 0.15 , R<sup>2</sup> = 0.86  
 (0.050) (0.015)  
 19.41 10.09

KOEL = 1.30\*ENVC, Errorvar.= 0.17 , R<sup>2</sup> = 0.91  
 (0.063) (0.020)  
 20.59 8.72

KOVB = 1.31\*ENVC, Errorvar.= 0.15 , R<sup>2</sup> = 0.92  
 (0.063) (0.017)  
 20.65 8.97

KOEB = 1.22\*ENVC, Errorvar.= 0.083 , R<sup>2</sup> = 0.95  
 (0.057) (0.011)  
 21.25 7.33

CTEP = 1.42\*ENVC, Errorvar.= 0.29 , R<sup>2</sup> = 0.88  
 (0.071) (0.032)  
 19.87 8.86

CTWR = 0.95\*ECOC, Errorvar.= 0.83 , R<sup>2</sup> = 0.52  
 (0.072) (0.090)  
 13.17 9.23

CTCR = 0.76\*ECOC, Errorvar.= 0.094 , R<sup>2</sup> = 0.86  
 (0.043) (0.028)  
 17.75 3.30

CTHB = 0.76\*GAC, Errorvar.= 0.11 , R<sup>2</sup> = 0.84  
 (0.041) (0.014)  
 18.78 7.88

POEL = 1.19\*GAC, Errorvar.= 0.13 , R<sup>2</sup> = 0.91  
 (0.059) (0.027)  
 20.29 4.87

POEC = 1.44\*GAC, Errorvar.= 0.49 , R<sup>2</sup> = 0.81  
 (0.079) (0.057)  
 18.28 8.55

PONI = 1.09\*RELC, Errorvar.= 0.76 , R<sup>2</sup> = 0.61  
 (0.077) (0.083)  
 14.27 9.20

PORP = 1.37\*RELC, Errorvar.= 0.081 , R<sup>2</sup> = 0.96  
 (0.069) (0.074)  
 19.83 1.10

OFCR = 1.12\*RELC, Errorvar.= 0.76 , R<sup>2</sup> = 0.62  
 (0.077) (0.083)  
 14.46 9.05

Error Covariance for CTEP and KOEL = -0.12  
 (0.018)  
 -6.63

Error Covariance for CTEP and KOEB = 0.049  
 (0.015)  
 3.26

Error Covariance for CTWR and KOEL = -0.28  
 (0.033)  
 -8.35

Error Covariance for CTWR and CTEP = 0.29  
 (0.037)  
 7.86

Correlation Matrix of Independent Variables

|      | ENVC  | ECOC  | RELC | GAC  |
|------|-------|-------|------|------|
| ENVC | 1.00  |       |      |      |
| ECOC | 0.72  | 1.00  |      |      |
| RELC | -0.17 | -0.08 | 1.00 |      |
| GAC  | 0.04  | 0.10  | 0.28 | 1.00 |

Goodness of Fit Statistics

Degrees of Freedom = 66  
 Minimum Fit Function Chi-Square = 190.26 (P = 0.00)  
 Normal Theory Weighted Least Squares Chi-Square = 173.47 (P = 0.00)  
 Estimated Non-centrality Parameter (NCP) = 107.47  
 90 Percent Confidence Interval for NCP = (72.26 ; 150.36)

Minimum Fit Function Value = 0.75  
 Population Discrepancy Function Value (F0) = 0.43  
 90 Percent Confidence Interval for F0 = (0.29 ; 0.60)  
 Root Mean Square Error of Approximation (RMSEA) = 0.080  
 90 Percent Confidence Interval for RMSEA = (0.066 ; 0.095)  
 P-Value for Test of Close Fit (RMSEA < 0.05) = 0.00045

Expected Cross-Validation Index (ECVI) = 1.00  
 90 Percent Confidence Interval for ECVI = (0.86 ; 1.17)  
 ECVI for Saturated Model = 0.83  
 ECVI for Independence Model = 18.12

Chi-Square for Independence Model with 91 Degrees of Freedom = 4537.84  
 Independence AIC = 4565.84  
 Model AIC = 251.47  
 Saturated AIC = 210.00  
 Independence CAIC = 4629.30  
 Model CAIC = 428.27

Saturated CAIC = 686.01

Normed Fit Index (NFI) = 0.96  
 Non-Normed Fit Index (NNFI) = 0.96  
 Parsimony Normed Fit Index (PNFI) = 0.69  
 Comparative Fit Index (CFI) = 0.97  
 Incremental Fit Index (IFI) = 0.97  
 Relative Fit Index (RFI) = 0.94

Critical N (CN) = 127.66

Root Mean Square Residual (RMR) = 0.075  
 Standardized RMR = 0.046  
 Goodness of Fit Index (GFI) = 0.91  
 Adjusted Goodness of Fit Index (AGFI) = 0.86  
 Parsimony Goodness of Fit Index (PGFI) = 0.57

## References

- Akenji, L., 2014. Consumer scapegoatism and limits to green consumerism. *J. Clean. Prod.* 63, 13–23.
- Akenji, L., Bengtsson, M., 2010. Is the Customer Really King? Stakeholder Analysis for Sustainable Consumption and Production Using the Example of the Packaging Value Chain. In: *Sustainable Consumption and Production in the Asia-Pacific Region: Effective Responses in a Resource Constrained World*. IGES, pp. 23–46.
- Andrews, C., DeVault, D., 2009. Green niche market development: a model with heterogeneous agents. *J. Ind. Ecol.* 13 (2), 326–345.
- Azevedo, S.G., Carvalho, H., Machado, V.C., 2011. The influence of green practices on supply chain performance: a case study approach. *Transp. Res. Part E* 47, 850–871.
- Banyte, J., Brazioniene, L., Gadeikiene, A., 2010a. Investigation of green consumer profile: a case of Lithuanian market of eco-friendly food products. *Econ. Manag.* 15, 374–383.
- Banyte, J., Brazioniene, L., Gadeikiene, A., 2010b. Expression of Green marketing developing the conception of corporate social responsibility. *Eng. Econ.* 21 (5), 550–560.
- Beamon, B.M., 1999. Designing the green supply chain. *Logist. Inf. Manag.* 12 (4), 332–342.
- Boomsma, A., Hoogland, J.J., 2001. The Robustness of LISREL Modeling Revisited, Department of Statistics and Measurement Theory. University of Groningen, The Netherlands.
- Borin, N., Cerf, D.C., Krishnan, R., 2011. Consumer effects of environmental impact in product labeling. *J. Consumer Mark.* 28 (1), 76–86.
- Boztepe, A., 2012. Green marketing and its impact on consumer buying behavior. *Eur. J. Econ. Polit. Stud.* 5 (1), 5–21.
- Brecard, D., 01/2013. Consumer confusion over the profusion of eco-labels: lessons from a double differentiation model. *Resour. Energy Econ.* 37. <http://dx.doi.org/10.1016/j.reseneeco.2013.10.002> (accessed 04.05.14).
- Byrne, B.M., 1998. *Structural Equation Modeling with LISREL, PRELIS, and SIMPLIS: Basic Concepts, Applications, and Programming*. Lawrence Erlbaum Associates, NJ & London.
- Chen, F., Bollen, K.A., Paxton, P., Curran, P., Kirby, J., 2001. Improper solutions in structural equation models: causes, consequences, and strategies. *Sociol. Methods & Res.* 29, 468–508.
- Elkington, J., 1998. *Cannibals With Forks: the Triple Bottom Line of 21st Century Business*. Oxford Publishing, UK.
- European Commission, 2007. *Costs and Benefits of Green Public Procurement in Europe*. Prepared by Institute of Applied Ecology and ICLEI for EC, 4–242.
- Ferrell, G., Hartline, M., 2011. *Marketing Strategy*, fifth ed. Cengage Learning, NY.
- Ginsberg, J.M., Fall 2004. Choosing the right Green marketing strategy. *MIT Sloan Manag. Rev.* 79–84.
- Gupta, S., Ogden, D.T., 2009. To buy or not to buy? A social dilemma perspective on green buying. *J. Consumer Mark.* 26 (6), 376–391.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2009. *Multivariate Data Analysis*, seventh ed. Pearson Education, London.
- Haws, K.L., Winterich, K.P., Naylor, R.W., 2013. Seeing the world through GREEN-tinted glasses: Green consumption values and responses to environmentally friendly products. *J. Consumer Psychol.* 1–19. <http://dx.doi.org/10.1016/j.jcps.2013.11.002> (Retrieved on 11 January 2014).
- Kai, S.B., Chen, O.B., Chuan, C.S., Seong, L.C., Kevin, L.L.T., 2013. Determinants of willingness to pay for organic products. *Middle-East J. Sci. Res.* 14 (9), 1171–1179.
- Kaiser, B., Eagan, P.D., Shaner, H., 2001. Solutions to health care waste: life-cycle thinking and Green purchasing. *Environ. Health Perspect.* 109 (3), 205–207.
- Kaufman, N., 2013. Overcoming the barriers to the market performance of green consumer goods. *Resour. Energy Econ.* 1–21. <http://dx.doi.org/10.1016/j.reseneeco.2013.05.007> [Accessed: 02 January 2014].
- Kilbourne, W., McDonagh, P., & Prothero, A. (1997), "Sustainable consumption and the quality of life: a macromarketing challenge to the dominant social paradigm", *J. Macromarketing*, Spring 1997: 4–24.
- Kotler, P., 2000. *Marketing Management*, Millenium Edition, tenth ed. Pearson Education, NJ.
- Lin, P., Huang, Y., 2012. The influence factors on choice behavior regarding green products based on the theory of consumption values. *J. Clean. Prod.* 22, 11–18.
- Matthes, J., Wonneberger, A., Schmuck, D., 2013. Consumers' green involvement and the persuasive effects of emotional versus functional ads. *J. Bus. Res.* 1–9. <http://dx.doi.org/10.1016/j.jbusres.2013.11.054> (accessed 03.01.14).
- Menichelli, E., Hersleth, M., Almoy, T., Naes, T., 2014. Alternative methods for combining information about products, consumers and consumers' acceptance based on path modelling. *Food Qual. Prefer.* 31, 142–155.
- Mohr, L.A., Webb, D.J., Harris, K.E., 2001. Do consumers expect companies to be socially responsible? the impact of corporate social responsibility on buying behavior. *J. Consumer Aff.* 35 (1), 45–72.
- Nyborg, K., Howarth, R.B., Brekke, K.A., 2003. *Green consumers and Public Policy: on Socially Contingent Moral Motivation*. Oslo University, Department of Economics. Memorandum 31/2003.
- Ottman, J.A., 2008. The five simple rules of Green marketing. *Des. Manag. Rev.* (Fall 2008), 65–69.
- Owusu, V., Anifori, M.O., 2013. Consumer willingness to pay a premium for organic fruit and vegetable in Ghana. *Int. Food Agri-business Manag. Rev.* 16 (1), 67–86.
- Palevich, R., 2012. *The Lean Sustainable Supply Chain: How to Create a Green Infrastructure with Lean Technologies*. Pearson Education, London.
- Peattie, K., Charter, M., 2003. *Green marketing*. In: Baker, M.J. (Ed.), *Book Chapter: the Marketing Book*. Elsevier, Worldwide.
- Peattie, K., Crane, A., 2005. Green marketing: legend, myth, farce or prophesy? *Qual. Mark. Res. Int. J.* 8 (4), 357–370.
- Pepper, M., Jackson, T., Uzzell, D., 2009. An examination of the values that motivate socially conscious and frugal consumer behaviours. *Int. J. Consumer Stud.* 33, 126–136.
- Prakash, A., 2002. Green marketing, public policy, and managerial strategies. *Bus. Strategy Environ.* 11, 285–297.
- Rencher, A.C., 2002. *Methods of Multivariate Analysis: Inferential Statistics*. Wiley Publishers, NJ.
- Rex, E., Baumann, H., 2007. Beyond ecolabels: what green marketing can learn from conventional marketing. *J. Clean. Prod.* 15, 567–576.
- Sammer, K., Wustenhagen, R., 2006. The influence of eco-labelling on consumer behaviour—results of a discrete choice analysis for washing machines. *Spec. Issue: Sustain. Mark.* 15 (3), 185–199.
- Schaefer, A., Crane, A., 2005. Addressing sustainability and consumption. *J. Macromarketing* 25 (1), 76–92.
- Schlegelmilch, B.B., Bohlen, G.M., Diamantopoulos, A., 1996. The link between green purchasing decisions and measures of environmental consciousness. *Eur. J. Mark.* 30 (5), 35–55.
- Schwartz, S.H., 1992. Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. In: Zanna, M.P. (Ed.), *Advances in Experimental Social Psychology*. Academic Press, San Diego, CA, pp. 1–65.
- Schwartz, S.H., 1994. Are there universal aspects in the structure and contents of human values? *J. Soc. Issues* 50, 19–45.
- Spaargaren, G., 2003. Sustainable Consumption: A theoretical and environmental policy perspective. *Soc. Nat. Resour.* 16, 687–701.
- Srivastava, S.K., 2007. Green supply-chain management: a state-of-the-art literature review. *Int. J. Manag. Rev.* 9 (1), 53–80.
- Steen, B., 2005. Environmental costs and benefits in life cycle costing. *Manag. Environ. Qual. Int. J.* 16 (2), 107–118.
- Thøgersen, J., 2011. Green shopping: for selfish reasons or the common good? *Am. Behav. Sci.* 55 (8), 1052–1076.
- Thøgersen, J., Jørgensen, A., Sandager, S., 2012. Consumer decision-making regarding a "green" everyday product. *Psychol. Mark.* 29 (4), 187–197.
- Tseng, S., Hung, S., 2013. A framework identifying the gaps between customers' expectations and their perceptions in green products. *J. Clean. Prod.* 59, 174–184.
- White, K., MacDonnell, R., Ellard, J.H., 2012. Belief in a JustWorld: consumer intentions and behaviors toward ethical products. *J. Mark.* 76, 103–118.
- Xia, Wei, Zeng, Yinchu, June 19, 2006. *Consumer's Attitudes and Willingness-to-Pay for Green Food in Beijing*. <http://dx.doi.org/10.2139/ssrn.2281861>. Available at SSRN: <http://ssrn.com/abstract=2281861>.
- Xu, P., Zeng, Y., Fong, Q., Lone, T., Liu, Y., 2012. Chinese consumers' willingness to pay for green- and eco-labeled seafood. *Food Control.* 28, 74–82.
- Young, W., Hwang, K., McDonald, S., Oates, C.J., 2010. Sustainable consumption: Green consumer behaviour when purchasing products. *Sustain. Dev.* 18, 20–31.
- Zhao, H., Gao, Q., Wu, Y., Wang, Y., Zhu, X., 2014. What affects green consumer behavior in China? A case study from Qingdao. *J. Clean. Prod.* 63, 143–151.