Green Product Consumers Segmentation Using Self-Organizing Maps in Iran

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Abstract

This study aims to segment the market based on demographical, psychological, and behavioral variables, and seeks to investigate their relationship with green consumer behavior. In this research, self-organizing maps are used to segment and to determine the features of green consumer behavior. This was a survey type of research study in which eight variables were selected from the demographical, psychological, and behavioral dimensions. Data were gathered through researcher-made questionnaire and distributed it among the statistical population (supermarket chains in Rasht city). The sample size was 392. The result showed that among the demographical variables, age, sex, and education had a direct contribution with green consumer behavior, whereas income had an adverse relationship with that. Psychological and behavioral variables including personal values, religiosity, environmental knowledge and attitudes, and personal habits are key predictors of green consumer behavior. The results identified four segments, which were called intense greens, potential greens, selfish darks, and intense darks. Green product marketers and producers can determine the target market using the results and employ an appropriate combined marketing strategy for consumers' based on their respective features.

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INTRODUCTION

The concept of green products is related to sustainable manufacturing and supply chain management, which involve environment friendly, planet friendly, and people friendly standards, technologies and practices. Marketers should know about what green consumers they are looking for in a green product before positioning their green labeling (Maniatis, 2015). It needs to be ascertained whether they are looking at true ecological performance of the product (socially responsible consumption) or personal benefits (Peattie & Charter, 2003). Pollution and environmental problems, and concerns regarding the environment have influenced the purchase patterns and created a new group of consumers – green consumers. As green consumers increase, marketers target the green segment of the market. To accomplish this, first, a purposeful strategy must be developed to segment the market and to determine the specific features of each segment. For the effective marketing of green products, marketers need to segment green consumers with similar features (Sandu, 2014). 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 & Hartline, 2011). The green products have been proven to have reduced harmful side effects, hazards, toxic substances, health issues, improved recyclability, and environmental friendliness (Azevedo et al., 2011). Therefore, for green products development, marketing should be begun with the knowledge, beliefs, attitudes, needs, and wants of the green and should be performed with a long-term perspective in consumers mind, and with full management commitment to company resources, and innovation in company (Jansson & Marell, 2010; Jansson et al., 2010). Consumers' knowledge of green product and the effects of toxicity on health would change their tendency toward these products (KavoosiKalashami et al., 2012). The green products and their marketing strategy should be designed based on actual consumer consumption patterns and consumer segmentation should be performed in accordance with them

(Ferrell & Hartline, 2011). Green Segmenting is very important because the first step in planning the target marketing strategy is to segment the market and to develop the profiles of the resulting market segments. In fact, the usefulness of market segmentation hinges upon accurate profiling. Relatively low accuracy in forecasting segment membership will result in ineffective marketing programs and potential negative impact due to targeting unintended segment members.

Many pundits argue that market segmentation is the only solution for modern marketing due to the lack of resources. Market segmentation is employed because of the preferences for different products and purchase behavior (Do Paco & Raposo, 2010). These differences are normally represented in products and consumers. Market segmentation helps companies and businesses deal with market heterogeneity and resource limitations differently, and balance different customer needs. For many businesses, it is evident that one cannot meet the diverse needs of different customers. Therefore, we must focus our marketing efforts on certain segments, and, in turn, we can meet better market needs using limited resources

Previous studies have also suggested that the affinity of Iranian consumers for green products has increased over the years and hence, they are being seen as potential users of green products (Delafrooz et al., 2014). Since different cultures have different attitudes toward environmental issues and problems, and diverse factors induce consumers to behave greenly, research must be conducted to determine the features of Iranian green consumers, given the culture and specific values of Iranian citizens (Hosseini & Ziaei-Bideh, 2013). There is evidence that knowledge of environment issue, environmental attitude, perceived quality of green product and environmental friendly behaviors difference across cultures positively influence the green purchasing intention (Mostafa, 2011; Shahlaee Bagheri, 2014). Therefore, consumer research examines factors that motivate the adoption of green behaviors and products in Iranian consumers (Shalaee Bagheri, 2014).

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Marketers and producers of green products can determine their target market using the results, and employ an appropriate combined marketing strategy for consumers based on their features. More specifically, the aim of it is twofold: (1) to investigate the influence of various psychographic and cognitive factors on green product donation behavior in Iran. And (2) to benchmark the clustering performance of green products consumer.

Literature Review
Green purchasing behavior

Green consumerism or Green behavior refers to consumer products that care for and are useful for the environment and is one of the pro-environmental behaviors. There are different terms used interchangeably with green buying behavior such as pro-environment purchase behavior, environmentally responsible purchase behavior, and green purchase behavior (Kim & Choi, 2005; Tan, 2011). These terms are often used in the similar meanings used to examine the buying behaviors towards green product or environmentally sound product.

In the green behavior context, there has been research on real behavior, while some research has investigated behavioral intention, and the others have studied both. Green purchase intention is the probability that a person prefers a product with environmentally desired features over a common product equivalent (Wu et al., 2015). Most research which investigate both variables show that behavioral intention is a very good predictor of a real behavior. Some research have found a high correlation between behavioral intention and real behavior, therefore purchase intention is a good predictor for the real behavior (Wu et al., 2015; Kavoosi Kalashami et al., 2012). According to the rational choice theory, a person's intention and tendency are basic and fundamental factors to conduct a behavior or task, and also are a good predictor of the real behavior (Abbasi et al., 2012).

In recent years, as green marketing grows, researchers draw more attention to different and special subjects in this field. Researchers have addressed different aspects of green consumer behavior, and in their research, they investigated the impact of different factors on green purchase behavior. The results show that environmental beliefs and green purchase behavior as well as green general behavior, previous experience with perceived quality of green products, and perceived quality of green products with green purchase behavior are positively correlated with each other. In addition, another research implies that a company can increase green products by improving their safety and beauty through effective marketing strategies. In another research, the effects of different factors such as social factors, attitude, concerns, environmental problems relevance, responsiveness, and the efficiency of environmental behavior in the green purchase were investigated (Abbasi et al., 2012).

Demographical variables

Demographic segmentation is a common way to segment the consumers. Generally, these variables are mainly considered as personal, social, and economical factors. In this segmentation, consumers are segmented according to the variables like age, sex, race, education, job, income, generation, religion, nationality, social class, family situation, family size, and family lifecycle (Goyat, 2011). Unlike the contradictory results, most of the previous research suggests that demographical variables are helpful to segment the green market (Diamantopoulos et al., 2003). A survey research showed that which effect of demographical variables on knowledge, attitude, and environmental behavior were studied. Their results show that previous research emphasize on age, sex, education, and income as variables (Mostafa, 2011).

Kaufmann et al. (2012) reported that age, gender, income level, education degree, ethnicity, and occupation are demographic variables and environmental knowledge and environmental awareness are independent variables affecting the green purchasing behaviors of the consumers in a positive way. Besides, demographic characteristics (age, income education, gender, and marital status) have a moderate effect on this model (Boztepe, 2012). The results showed that education, income, and age but not marital

status, gender has a moderating effect on consumer green sports behavior (Shahlaee Bagheri, 2014).

Psychological variables

Psychological segmentation is another way to segment the consumers. In the late 1960s, psychological segmentation was developed by researchers in order to better understand what consumers think and believe. However, due to the small samples and little relationship between them, they did not provide detailed information about consumers" behavior and segmentation. In the psychological segmentation, they investigate personal values and lifestyle. Studying the psychological factors is more difficult than demographic ones. However, it is thought that this method is detailed enough to identify consumer segments. Psychological factors include social class, political tendencies, personal attributes, altruism, and environmental concerns. The study concluded with psychographic variables as more convincing towards affecting the behavior. These factors also represent lifestyle, activity and attitude. Some researchers employ activities, interests, and beliefs for psychological segmentation (Goyat, 2011).

Psychological variables are the most common variables to segment the consumers, especially green consumers. In this research, the effects of psychological variables (e.g. personal values and religiosity) on green consumes' behavior are investigated.

Personal Values: Value is defined as concepts or beliefs about desirable end states or behaviors that transcend specific, situations guide the selection or evaluate the behavior. (Mostafa, 2011; Schwartz, 1992). Consumer values and beliefs must be considered when investigating factors affecting purchase intention. Environmental values have a major role in behavior compatible with the environment, because values impact on beliefs, and in turn, on personal norms and result in positive environmental behavior (Abbasi et al., 2012). Personal values such as altruism, nature-friendliness, and egoism are the most influencing factors on environmental friendly behaviors (Hosseini & Ziaei-Bideh, 2013).

Religiosity: religion is investigated as an im-

portant cultural factor affecting personal behavior. Religious commitment plays an important role in personal life through belief formation, knowledge, and attitude. Environmental issues are investigated by Islamic texts. Religious education gives people a sense of commitment and responsibility in terms of environmental behavior (Abbasi et al., 2012). Religiosity has a direct relationship with their environmental friendly behavior.

Behavioral variables

In this method, buyers are segmented by their level of knowledge, attitude, product used or response thereto. In this method, indicators include buyer interest, consumption rate, and loyalty and buyer readiness. Buyer attitude (fond, positive, incurious, negative, enmity) is an indicator to segment the market. Buyers are segmented by their level of knowledge about a product, belief, environmental attitude, and tendency towards environmental friendly behavior.

Environmental attitude: Environmental attitude is defined as a set of beliefs, tendencies, emotions, and behavioral intentions about the environment. In other words, it is a background, internal mood, talent or learned tendency to a desirable response or undesirable behavior (Abbasi et al., 2012). In the marketing and the green consumer area, considerable research has been conducted on the effects of environmental attitudes on environmental friendly behavior.

Environmental knowledge: Environmental knowledge refers to how much people know about the environment and its issues. This knowledge directs humans towards the acquisition of information and awareness about green brands, and the creation of a positive attitude towards green brands. Accordingly, consumers must have a good understanding about environmental issues and move toward the desired environmental behavior (Abbasi et al., 2012). Researchers argue that the difference between persons actively protecting the environment and less-interested people is dependent on their environmental knowledge (Hosseini & Ziaei-Bide, 2013).

Personal habits: personal habits influence personal satisfaction and the desire to change ones

behavior. Personal habits influence people's desire to conduct green behavior including recycling, reducing energy consumption, and using green energy resources as well as environmental-unfriendly behavior (Hosseini & Ziaei-Bideh, 2013).

Self-Organizing maps

Self-organizing maps are a type of artificial neural network. It is a branch of analytical data mining and a powerful and attractive tool to represent multi-dimensional data in low-dimensional spaces "typically one or two dimensions" (Chattopadhyay et al., 2012). In addition, these maps are a method to cluster and pre-process information. Self-organizing maps, which are called Kohonen maps, were developed by Kohonen, a university professor in Finland. In this method, any node in the output table has a certain position. This table has a weighting vector with the same dimension of input table (Mostafa, 2010). Self-organizing maps are a non-supervised neural network that provides network output in the form of illustrative and understandable graphical maps. Their merits are non-sensitivity to the number of training data, low sensitivity to noise in the data, linear and linear relationship between variables representation capabilities and excellent classification of data. Since these maps can graphically represent network outputs, understanding and interpreting the results is quicker and easier (Hanafizadeh & Rastkhiz, 2012).

MATERIALS AND METHODS

The statistical population comprised the consumers of big stores products in Rasht City. Big stores refer to stores that supply a variety set of goods of public needed only in one appropriate place. Among the qualified stores in Rasht, Najm, Oscar, Dolphin, Senator, Ahmadi and Etka chain stores were selected. The questionnaires were reviewed and confirmed by committee members. The questionnaires were distributed among customers without foreseeable risk of harm or discomfort. Participants completed the questionnaire voluntarily and were not inconvenienced in any way; hence, the survey was conducted under negligible risk".

In this study, convenience nonprobability sampling was employed. Participants were selected based on their availability or accessibility. For computing the sample size from Morgan sampling table is used. According to the Morgan table, the number samples were selected 384 people. To achieve the better results, 400 questionnaires were distributed among six selected stores. Out of them, 392 questionnaires had an adequate reliability index for analysis. Due to the lack of standard questionnaires in field of this research, items composed of questionnaire were extracted via reviewing previous researches and by consulting professors and their guidance, its validity was approved in terms of content.

The raining data (final sample size was 392) comprised eight vectors (questionnaire indicators) which represent one of the indicators. Using the following formula developed by Teuvo *Kohonen*, neuron numbers were computed:

$$5 = 5\sqrt{392} = 98.99 \cong 99$$

In this network structure, 100 neurons were placed in the output layer. The training speed was adjusted so that the maximum accuracy could be achieved automatically and the elasticity was 0.5. After training and final segmentation using the data of the psychological and behavioral variables, the demographical features of each segment were examined.

The research questionnaire had two main sections: In the first section, we included the demographical information of the respondent such as age, sex, marital status, education level, and income. In the second section included questions to evaluate the considered variables, which were evaluated using a 5-point Likert type scale (1=completely disagree to 5=completely agree). Table 1 shows the characteristics of the study questionnaire.

In order to measure the reliability before final distribution of the questionnaire, 35 questionnaires were randomly distributed among consumers. After collecting the questionnaires, the Cronbach's alpha was measured. The results showed that, generally, it was 0.90, which in turn implied that the questionnaire had adequate reliability.

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Table 1
Characteristics of the Study Questionnaire

Variables	Dimension	Scale	Researcher
Psychological variables	Personal values: nature-friendliness Altruism	5-point Likert type scale (1=completely disagree to 5= completely agree)	Mostafa (2009) Hosseini and Ziaei-Bideh (2013 Mostafa (2011)
Behavioral Variables	Egoism Religiosity Environmental attitudes and knowledge	5-point Likert type scale 5-point Likert type scale 5-point Likert type scale	Mostafa (2011) Hosseini and Ziaei-Bideh (2013)
Green behavior	Personal habits: Green behavior tendency Non-green behavioral habits Purchasing low consumption products Product effects on environment Encouraging to purchase green product	5-point Likert type scale 5-point Likert type scale	Mostafa (2009)

RESULTS

First, the researchers analyzed the statistical sample distribution in terms of the demographical variables. In total, 392 questionnaires were distributed. The respondents of this study consisted of 54% females and 46% males. It should be noted that there were more female respondents than males. With respect to the level of education, 12% of the respondents were under diploma; followed by 19% diploma, 17% bachelor, 36%master, and 16% graduate education. In terms of the level of income, the majority had an income of between $200 and $300 (n=253, 64.5%) and few respondents had an income over $900 (n=12, 3%).

In Table 2, the researchers provide the mean and standard deviation of each latent variable. As shown in Table 2, "the environmental knowledge" variable and "the attitude" variable have the highest score and the "personal habits" has the lowest one. In addition, the variable "personal habits" has the lowest scattering, and the "personal values" variable has the highest one.

In Figure 1, the final segmentation of green consumers is shown that include four segments or clusters. Then, we determined the borders; the characteristics of the consumers in each segment were examined.
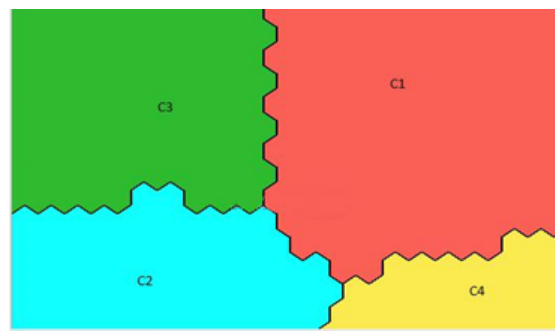

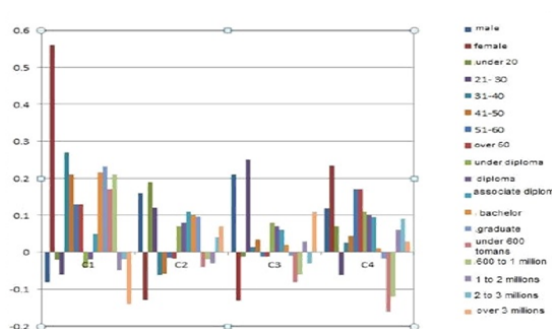*Figure 1.* Green consumer segmentation
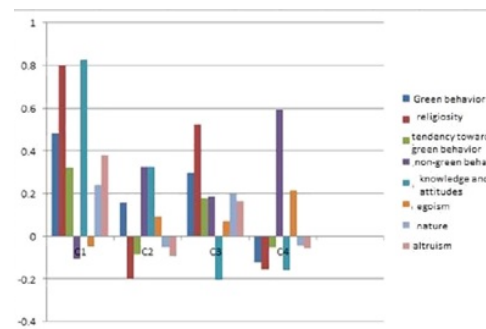

Figure 3. Demographical variables in the segments

Figure 2. Psychological and behavioral variables in the segments

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Table 2
Descriptive Indicators of Variables

Variables	Mean	SD
Environmental knowledge and attitude	4.37	0.789
Personal habits	3.43	0.993
Personal values	3.81	0.702
Religiosity	3.68	0.971
Green behavior	4.06	0.814

Table 3
Mean Variables in Each Segment

Variable Segment	Frequency	green behavior	environmental knowledge and attitude	tendency to green	non-green behavior	religiosity	Altruism	nature-friendliness	egoism
Segment1	34.2	4.54	4.72	4.51	1.76	4.01	4.94	4.65	2.13
Segment 2	23.2	3.95	4.34	3.92	1.96	3.75	4.54	4.48	2.74
Segment 3	29.3	4.01	4.41	4.48	3.21	3.95	4.72	4.97	2.02
Segment 4	13.7	3.76	4.01	3.81	3.85	3.01	4.01	4.15	2.49

Table 3 shows that the first segment consumers have the highest mean in green behavior and fourth segment consumers have the lowest mean. The first segment is the greenest segment of the market and the fourth segment is the least green one.

According to Figure 2, the common psychological and behavioral features of customers in each segment in comparison to the other segments. For example, the majority of customers in segment 4 have many non-green behavioral habits (purple column), highly selfish behavior (orange column), and the weakest green features.

In Figure 3 showed different levels of demographical variable with a specific color. Bar charts with a different color show the level of variables in the segments. For example, females (brown bar) in segment 1 have a greater presence than the others or the under-20 consumers (green bar) have a greater presence in segments 2 and 3.

Naming and describing the segments

After identifying and naming of the segments, we describe the market segments based on the demographical, psychological, and behavioral features of the consumers.

Segment one, intense greens: these green consumers have strong environmental values and a high tendency toward participating in the activities of environmental friendly organizations. The intense greens have strong beliefs about the environment and share them. This group strongly avoids buying the products of non-green producers. This segment of the market comprises 34.2% (134 people) of the total consumers. Regarding demographic features, the majority are 31 to 50 years old. Females" number is more than males one. They have a graduate degree, therefore they are nature-friendly, altruistic, and with a high religiosity psychology. They have a high knowledge and positive attitude toward green products and behavior, behaviorally. These consumers have a greater tendency toward buying green products and conducting environmental friendly behavior.

Segment two, selfish darks: This segment comprises 23.2% (91 people) of the consumers. These consumers are 20 to 30 years old and have a moderate to high income. In this segment,

no pattern regarding education was found. Their altruism, nature-friendliness, and religiosity are rather low. Therefore, they have a negative attitude toward green behavior. These consumers have moderate knowledge about green products and environmental issues. In these consumers, altruism is high, and in turn, they have a little tendency to conduct green and nature-friendly behavior.

Segment three, potential greens: They aim to learn environmental issues. These consumers attempt to convert their behavior into an environmental friendly one. They have a basic knowledge about the environment. This segment comprises 29.3% (127 people) of consumers. The majority of them are 20 to 35 years old, and male. Their income and education level are distributed non-uniformly. These consumers have high altruism and nature-friendliness values. Although they have a positive attitude toward the environment, they do not have adequate environmental knowledge. They exhibit a little green behavior. In addition, these consumers do not conduct themselves in a green manner.

Segment four, intense darks: these consumers have a little knowledge about the environment. Therefore, this group argues that green products have a low quality and producers claim that these products have a high quality to sell more. These consumers are more involved in daily issues and do not pay attention to the environmental issues. This segment is the smallest and non-greenest segment of the market. These consumers have a moderate to high income. Their environmental knowledge and attitude, tendency to conduct green behavior and to purchase green products are the lowest. They have non-green habits, and they are highly-egotistical. In addition, they have a low altruism, nature-friendliness and religiosity.

CONCLUSION AND RECOMMENDATIONS

The results suggest that green consumers have different demographical, psychological, and behavioral patterns compared to non-green ones. The significant difference between green consumers and non-consumers among the Iranian people lies in their perception of environmental concern associated with green consumption patterns which suggests that governmental agencies should develop sophisticated strategies to increase the level of environmental awareness such psychological (e.g. personal values and religiosity), an altruistic (e.g. moral responsibility). It is preferable to employ special strategies for each segment of green consumers than to have only one for the whole segment. In addition, the results emphasize that environmental knowledge and attitude, personal values, and religiosity are good predictors of green consumer behavior.

Given that there is a significant difference between advertisements in the green and non-green segments, marketers must develop certain strategies to improve them. Marketers must perform activities such as analyzing the needs and demands of green consumers, developing advertisements on green marketing and examining new opportunities for marketing. (Hosseini & Ziaei-Bideh, 2013).

Intense greens: This segment is the best target market for green products. These consumers are not attracted through traditional marketing. Companies which support environmental activities and develop educational environmental programs can attract these consumers. Given that these consumers are older and highly educated, marketers can employ appropriate marketing strategies for them. Given that these consumers have a low income, appropriate and fair pricing is helpful. In addition, given their high altruism, nature-friendliness, and religiosity, companies must produce advertisements highlighting these values. This is an appropriate way to persuade these consumers. Intense greens may become loyal consumers. Companies must spend money to attract them, because they have many long-term benefits for them.

Selfish darks: Although at first glance these consumers are not a good target market for green products. Marketers can attract their attention to the hazards resulting from environmental problems and long-run economic benefits of green products and therefore, they can persuade this segment to purchase green products and to behave environmental friendly. It can be helpful to prove that environmental issues are important

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and that the environment has a high importance.

Potential greens: These consumers are highly altruistic and nature-friendly and therefore, they can be an appropriate target for green products. Marketers can persuade them to conduct green behavior and to purchase green products by improving their knowledge regarding the product merits, green behavior, and environmental problems. Their interest in conducting environmental friendly behavior can help marketers. Marketers can improve their environmental knowledge by providing educational programs on the environment and broadcasting them in the mass media.

Intense darks: These consumers are an inappropriate target for green products and it is difficult to persuade them to demonstrate environmental friendly behavior.

This study much more emphasis has been placed on observing respondents' behaviors than in observing changes in behavior. There would seem to be hence a need for much more longitudinal research to focus on observing changes in respondents' behavior over time. Second, the measures used in the study are based on self-reports of past behaviors or predictions about future actions.

REFERENCE
Abbasi, G., & Enaiati, Gh.R., & Rahbari, M. (2012) Factors affecting the behavior of green purchasing Iranian Students (Case Study: Islamic Azad University of Qazvin). *Research Management Journal, 27*, 35-49.

Azevedo, S.G., Carvalho, H.., & Machado,V.C. (2011). The influence of green practices on supply chain performance: A case study approach. *Logistics and Transportation Review, 47*(6), 850–871.

Boztepe, A. (2012). Green marketing and its impact on consumer buying behavior. European *Journal of Economic and Political Studies, 5*(1), 5- 14.

Chattopadhyay, M.K., Dan, P., Majumdar, S., &

Chakraborty, P. (2012). Application of artificial neural network in market segmentation: A review On recent trends. *Management Science Letters, 2*(2), 425-438.

Diamantopoulos, A., Schlegelmikch, B., Sinkovics, R., & Bohlem, G. (2003). Can Socio-demographics still play a role in profiling green consumers? Review of the evidence and an empirical investigation. *Journal of Business Research, 56* (6), 465-480.

Do Paco, A.F., & Raposo, M.B. (2010). Green consumer market segmentation: Empirical findings from Portugal. *International Journal of Consumer Studies, 34*(4), 429-436.

Delafrooz, N., Taleghani, M., & Nouri, B. (2014). Effect of green marketing on consumer purchase behavior. *QScience Connect, 5*, 1-9

Ferrell, O.C., & Hartline, M. (2011). *Marketing Strategy, 5th ed.* South Western Cengage Learning, Mason: Ohio, 743 p.

Goyat, S. (2011). The basis of market segmentation: A critical review of literature. *European Journal Business Management, 3,* 45-54.

Hanafizadeh, N., & Rastkhiz, P. (2012). a data mining model for risk assessment and customer segmentation in the insurance industry. *International Journal of Strategic Decision Sciences, 4*(1), 51-77.

Hosseini, S.Y., & Ziaei-bideh, A.S. (2013). Segmentation and profiling green consumers with using self-organizing maps. *Management Research in Iran, 2* (80), 43-68.

Jansson, J., & Marell, A. (2010). Green consumer behavior: determinants of curtailment and eco-innovation adoption. *Journal of Consumer Marketing, 27* (4), 358–370.

Jansson, J., Marell, A., & Nordlund, A. (2010). Green consumer behavior: Determinants of curtailment and eco-innovation adoption. *Journal of Consumer Marketing, 27*(4), 358-370.

KavoosiKalashami, M., Heydari, M., & Kazerani, H. (2012). Investigating consumers' willingness to pay for organic green chicken in Iran (Case Study: Rasht City). *International Journal of Agricultural Management and Development, 2*(4), 235-241.

Kaufmann, H.R., Panni, M., & Orphanidou,Y. (2012). Factor's affecting consumers‟ green

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purchasing behavior: an integrated conceptual framework. *Amfiteatru Economic Journal, 15*(31), 50-69.

Kim, Y., & Choi. S.M. (2005). Antecedents of green purchase behavior: An examination of collectivism, environmental concern and PCE. *Advances in Consumer Research, 32*, 592-599.

Maniatis, P. (2015). Investigating factors influencing consumer decision-making while choosing green products. *Journal of Cleaner Production, 132*, 215-228.

Mostafa, M.M. (2009). Shades of green: A psychographic segmentation of the green consumer in Kuwait using self-organizing maps. *Expert Systems with Applications, 36* (8), 11030–11038.

Mostafa, M.M. (2010). Clustering the ecological footprint of nations using Kohonen's self-organizing maps. *Expert Systems with Applications, 37*, 2747–2755.

Mostafa, M.M. (2011). A Psycho-cognitive Segmentation of Organ Donors in Egypt Using Kohonen's self-organizing maps. *Expert Systems with Applications, 38,* 6906–6915.

Peattie, K., & Charter, M. (2003). *Green Marketing.* In: Baker, M.J. (Ed.), Book Chapter: the Marketing Book. Elsevier, Worldwide.

Sandu, R.M. (2014). Green: Marketing, Products and Consumers. *Practical Application of Science, 3* (5), 555-562.

Shahlaee Bagheri, J. (2014). Green marketing and its impacts on consumer behavior in sports shops. *Annals of Applied Sport Science, 2* (2), 75-82.

Schwartz, S.H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), Advances in experimental social psychology. New York: *Academic Press, 25*, 1-65.

Tan, B.C. (2011). The roles of knowledge, threat and perceived consumer effectiveness on green purchase behavior. *International Journal of Business and Management, 6*(12), 14-27.

Wu, J.H., Wu, C.W., Lee, C.T., & Lee, H.J. (2015). Green purchase intentions: An exploratory study of the Taiwanese electric motorcycle market. *Journal of Business Research, 68*(4), 829-833.