

## CONSUMER BEHAVIOR SEGMENTATION CRITERIA PRICES VS. PRODUCT DIFFERENTIATION

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### **P**URPOSE

*THE aim of this paper is to propose a matrix with dimensions or blocks of consumer segmentation while simultaneously presenting seven synthesized covariates. The aim is also to show its importance through rating the Rao, Chi-square, and Wald statistics, which have demonstrated how these statistics and their bases of segmentation can be used for the construction of different marketing models using binary logistic regression models. For this, the authors considered the binary criterion based on consumer purchase price or its counterpart i.e. product attributes as dependent variables. Two demographic covariates were identified; the psychographic covariate as well as the three behavioral covariate were identified.*

**Methodology:** *The treatment and compliance objectives in this research are guided by compliance to traditional econometric methodology, concretized through the model of binary logistic regression.*

**Findings:** *The research shows that the matrix of dimensions and covariates are based on three behavioral dimensions that contribute more covariates of interest; expected benefits, brand awareness, and the customer's loyalty to the brand. The demographic dimension favors the following variables: education and income. On the other hand, the psychographic block provides us with the consumer personality type variable. It must be noted that this classification was made individually, variable by variable. Once everything is incorporated into the study, some variables may have to leave the model. Thus, the essential importance of the behavioral characteristics manifested by the consumer in the process of binary discrimination purchase is brought to light.*

**Value:** *This paper shows the importance to develop prototypes for product differentiation based on segmentation criteria via binary choice models. The theoretical discourse of marketing in this topic has emphasized proper general aspects to recognize only guidelines addressing the topic of interest. It does so by presenting a source area for research and practice in the absence of models that come to contribute in a practical and concrete way to resolve shortcomings in this field of knowledge.*

**Key Words:** *Matrix Segmentation, Product Differentiation, and Binary Purchasing Criteria.*

The aim of this study is to work on the model designed for the business and market studies, strongly focusing in the field of product differentiation and segmentation highlighting variables affecting consumer decisions. This study puts in evidence the contrast between the price criterion and the criterion that is

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*José G. Vargas-Hernandez, Cesar Francisco Cárdenas-Dávila, Elsa Patricia Orozco-Quijano, and Julio Cesar Cenicerros-Angulo*

based on the differentiation of attributes in a product. We also aim to have correspondence with the organizations' task force to distinguish them from their competitors. We examined companies and their products involved to further understand the identification of strategic variables for segmentation of its market. Thereby, we achieve an effective positioning to have a desirable corollary and a degree of monopoly control over the price of the goods offered in the market.

Thus, the most significant activity is to identify, select, and specify the main consumer characteristics, which must be predicted and analyzed. This process includes examining the importance of these elements in the process of decision-making by the purchaser of commodities. To achieve this, we emphasize the analysis through a binary logistic regression model since this method offers insight through the statistical scoring of Rao and Wald statistics. Both these statistics contribute variables in the proposed model.

However, for this type of research, it is necessary to first segment or stratify groups of consumers. It is crucial to correlate and determine the individual contribution and influence of each variable used for segmentation on customers who base their purchase decisions on the criterion of differentiation of attributes of product, with a special regard to purchases made on the criterion of prices. Hence, this research proposal is sought to explore the strategy of discrete choices, through a model that discriminates the dependent variable in binary form (price vs. attributes).

We also note that, the need described so far is of utmost importance to develop prototypes for product differentiation based on segmentation criteria via binary choice models. The theoretical discourse of marketing in this topic has emphasized to recognize only guidelines addressing the topic of interest. This is achieved by presenting a source area for research and practice in the absence of models that come to contribute in a practical and concrete way to resolve shortcomings in this field knowledge (Cenicerros, 2009).

## **Methodological Strategy**

The objectives in this research are guided by compliance to traditional econometric methodology and concretized through the model of binary logistic regression.

This research was conducted in the city of Culiacan, Sinaloa in Mexico. The information was gathered through the variables found in geographic, demographic, psychographic, and psychological segmentation. The approach was similar to that which was used in the purchase of edible oils.

The stratification of the geographic area for the collection of information divided the city into four regions: North, South, Northeast, and Northwest. The research covers a vast majority of the hypermarkets (shopping malls), where consumers usually make the purchase of staple foods.

The targeted subjects of this research consist of all individuals over the age of 18 years engaged in the purchase of commodities in the city of Culiacan. In some cases, there is only one decision maker per household whereas in other cases, we observed two household individuals who made purchases in the past.

Finally, we proceeded via probabilistic sampling by geographic strata, to apply the survey. To determine the sample size we proceeded as follows:

Levels of error ( $\epsilon$ ) and confidence in determining the size of probabilistic sample proportions ( $n_p$ ) when the population is unknown ( $N$ ).

$$n_p = \frac{Z^2(p)(q)}{\epsilon^2}$$

In the case of estimating proportions, Bowerman, O'Connell, & Murphree (2009) generalize the use of  $p$  values for the success of the event and  $q = 1 - p$  as its compliment.

**Table No. 1: Determination of Sample Size**

$p$	$q = 1 - p$	$\epsilon$	Confidence level	$n_p^*$
0.41	0.59	5%	95%	371
0.41	0.59	5.5%	95%	307
0.41	0.59	6%	95%	258
0.41	0.59	5%	94.12%	346
0.41	0.59	5.5%	94.12%	286

In regard to the purchase decision, there is a distinction to be made between the consumers who choose a product based predominantly on the price and those who focus on the characteristics (attributes) of the product. The assessment error rate was set at 5% with 95% confidence level; and the proportions obtained from the pilot study, were used to determine the minimum sample size. With the updated values of  $p$  and  $q$  applied to the research, a total of 349 questionnaires were distributed.

### Literature Review

Nowadays, firms are more concerned about individual consumer behavior as one of the main topics in marketing. It is a critical driver of business growth and innovation. Customer behavior analysis is an essential component of consumer purchase behavior segmentation, marketing, and business intelligence and analytics (Sheth, Mittal, & Newman, 1999). To target and reach the consumer to influence his or her decision purchasing is one of the main goals of marketing.

Consumer behavior as an applied social science is an interdisciplinary and relatively new field influenced by many disciplines and different perspectives, from the experimental psychology at individual level to cultural anthropology at social level. A positive perspective of consumer behavior emphasizes human rationality and material well-being dominated by a homogeneous western ideology which is challenged by the interpretive perspective stressing the symbolic and subjective experiences (Solomon, Bamossy, Askegaard, & Hogg, 2006).

Consumer behavior is the study of the processes involved when individuals or groups select, purchase, use or dispose products, services, ideas or experiences to satisfy needs and desires (Solomon et al., 2006). Buyer behavior is referred to the purchase interactions between producers and consumers while consumer behavior is the entire ongoing consumption process which includes before, at the time, and after consumption issues (Solomon et al., 2006). Consumer purchasing behavior refers to buyer's decisions on acquiring products and services for consumption or use to satisfy needs and solve problems. Consumer behavior is the study of the processes involved when individual or groups select, purchase, use, or dispose of the product, service, ideas or experiences to satisfy needs and desires (Solomon, 2013).

Consumer behavior influences potential customers by driving them to make buying decisions and making critical for producers, providers, and sellers to understand them at every stage of the process. On the other hand, consumer behavior influences all marketing activities and practices. The study of consumer buying behavior is critical for all the activities of marketing, such as market research, design and development, market segmentation, product differentiation and positioning, logistic and environmental analysis, etc. (Heidarzadeh & Parsa, 2012). Understanding the consumer buying behavior facilitates the stakeholders to develop more cost- and time efficient strategies (Luo, Lin, Koprinska, Berkovsky, & Chen, 2017).

Analysis of consumer behavior yields information about consumers in situations of choosing products and services and, therefore, it explains the different types of buying behavior, as an ongoing process. Consumer buying behavior does not merely study the relationships between producers and consumers at the time of purchasing, but it includes the analysis of the consumption processes relating the stages of pre purchase, purchase, and post purchase issues (Solomon, 2013). Analyzing consumer behavior

*José G. Vargas-Hernandez, Cesar Francisco Cárdenas-Dávila, Elsa Patricia Orozco-Quijano, and Julio Cesar Cenicerros-Angulo*

leads to predict purchasing behaviors, consumer satisfaction and, therefore, to determine the quality and quantity of products and services required to be manufactured.

Consumer behavior as a research issue has been analyzed from different theoretical approaches. The analysis of consumer behavior has been conducted in specific consumption contexts using consumer culture theory to support a variety of methods to explain trends in the market place (Arnould & Thompson, 2005). Research in consumer behavior has been conducted more in developed countries than in developing countries. There are also cross-cultural differences on consumer behavior (Usunier, 1995).

The perspective of Role theory emphasized by Salomon (1983) considers that consumer behavior resembles actions acted out by individuals to evaluate products and services and make consumption decisions (Goffman, 1959; Mead, 1934). Consumers usually engage in different roles besides being a chooser, communicators, identity-seeker, pleasure-seeker, victim, political consumer, rebel, and activist – sometimes simultaneously.

Perceptions of product quality influences consumers buying behavior prior to other factors, such as demographic, psychological, and shopping behavior (Szymanski & Busch, 1987). Consumer behavior is associated with demographic, socio economic, cultural, psychological characteristics among others. Besides, other external factors such as family roles, peer influence, and group influence are relevant factors on consumer buying decisions. Researchers have used socio-demographic variables to profile green consumer behavior (Park, Choi, & Kim, 2012), age and education (Sharma, 2015), education, income, and composite status measures used for segmentation (Mager & Kahle, 1995).

Govender & Govender (2016) found that there is no significant correlation between the age of consumers and green marketing, motivating them to change their consumption behaviors. Product packaging and labeling influence consumer behavior (Govender & Govender, 2016). Packaging of products is more likely to influence the buying behavior of female consumers than male consumers (Davis, 2014). Gender, age, and education level are socio demographic variables which influence green consumption behavior and also affect the purchase decision; young adults are highly influenced by green marketing (Ferrell & Hartline, 2014). Green marketing has high influence on females than males in changing their consumption behaviors (Wang, 2014).

Research studies about consumer behavior focus on such factors as product and price characteristics, decision-making ability, personality traits and satisfaction of buyers and consumers, social effects, environmental factors, appearance of stores. For example, research on consumer buyer behavior explores consumption and possession traits of consumers ranging from materialism to compulsive behavior.

More recently, consumer purchase behavior is being influenced by the emergence of green marketing due to the increasing awareness of consumers on the issues facing the environmental factor (Govender & Govender, 2016). This increasing of awareness levels is encouraging positive change in consumption behavior. Consumers are becoming more aware of the environment (Sawant, 2015) and have gained conscience that their own consumption behavior is influenced by the impact on the environment (Dagher & Itani, 2014). Consumers that have positive attitude towards environment show concern while making purchase (Ansar, 2013). A green consumer displays environmentally-friendly behavior embracing eco-friendly products (Boztepe, 2012).

Consumer previous knowledge, cognitive ability, and individual experience have relevance in making decisions on buying and consuming (Bettman & Park, 1980). Consumer buying decision is different among individuals is and also influenced by internal consumer behavior such as perception, altitude, and motivation. Attitudes and behavioral characteristics are important factors (Baltas, 1997). Different perceptions of consumers to the product's marketing results in difference in action and purchase behavior (Livesey & Lennon, 2007). Individual determinant such as shopping intention, attitude towards retail outlet, and shopping habit plays important role in shaping consumer buying behavior (Siringoingo & Kowanda, 2009). Consumers don't think about benefits and losses stemming from individual decisions to purchase goods, especially for everyday use (Pejas & Szafranska, 2011).

Consumers are exposed to variety of products diversified in price, quality, packages, and size. Price and product differentiation are important segmentation strategies to be developed in marketing. Price is the amount of money a consumer sacrifices to obtain the product (Zeithaml, 1988) and can be objective price (actual price of the product) or perceived price (individual belief about the price as per the quality of the product) (Burton & Lichtenstein, 1990). The individual buying behavior is based on product quality & price, both are relevant factors that cannot be separated easily. Price and consumer purchasing behavior are related when confirming that young consumers are more willing to pay the price for eco-friendly products (Boztepe, 2012). Consumer perceptions with respect to product quality and price have a positive and a negative influence on the buying behavior.

Consumer behavior can be studied and analyzed with qualitative or quantitative methods. Also a triangulation by the combination of both methodological approaches can be done to understand and to measure consumer behavior.

## **Segmentation**

Consumers build value for a product which is reflected in their willingness to pay for it. It helps the marketers to identify and classify the buyers into various segments. Such differentiation and segmentation processes determine the target markets. Branding enable product differentiation and distinction from other products designed to satisfy the same needs.

Market segments according to Solomon et al. (2006), are the groups whose members are similar to one another in one or more characteristics and different from members of other segments. Market segmentation is developed to position the products that meet the specific needs in different situations, temporal factors and physical, social, and emotional environments. Marketing segmentation strategies are implemented in order to target specific segments of groups of consumers sharing similar consumer behavior and characteristics to choose a specific brand. Applying the same criteria for market segmentation in different situations and context is under discussion (Bartos, 1989).

Recent customer segmentation approaches are based on identifying the different consumer on the basis of customer purchase behavior rather than following the traditional segmentation methods. Segmentation and targeting decisions would benefit from the analysis of psychographics and its influence on individual consumer behavior.

The segmentation process must meet the following criteria: consumers within the segment are similar to one another in terms of product needs, and these needs are different from consumers in other segments. Important differences among segments can be identified. The segment is large enough to be profitable. Consumers in the segment can be reached by an appropriate marketing mix. The consumers in the segment will respond in the desired way to the marketing mix designed for them (Solomon et al., 2006).

## **Modelling**

Consumer purchase behavior segmentation modeling is important for businesses in order to attract customers, track the dynamics of evolving behavior, and retain customers over time. A model should provide valuable information about consumer purchase behavior to the stakeholders of a firm in order to make a segmentation of the market to serve the different types of customers. Developing consumer purchase behavior segmentation models allows identification of the customer segments and targets for specific products and services (Rossi, McCulloch, & Allenby, 1996).

In the Hidden Markov Models (HMM) the possible states correspond to all groups of the partition (Xing & Sohn, 2007) although it has a label switching problem leading to non-identifiability (Jasra, Holmes, & Stephens, 2005).

The model of cluster analysis, such as Ward's hierarchical clustering method (Murtagh & Legendre, 2011), is used in consumer and buying behavior to classify the consumers into relatively homogeneous groups based on their buying behavior. Previously, the agglomeration schedule or technique is used to

*José G. Vargas-Hernandez, Cesar Francisco Cárdenas-Dávila, Elsa Patricia Orozco-Quijano, and Julio Cesar Cenicerros-Angulo*

identify the number of clusters before continuing with the cluster analysis. The findings of the cluster analysis result in the segmentation of consumers into various groups on the basis of the buying behavior.

Some other models of consumer buying behavior are the stochastic models of purchase behavior (Wagner & Taudes, 1987), for overall customers (Ehrenberg, 1959; Trinh, Rungie, Wright, Driesener, & Dawes, 2014) and individual customers (Kim, Takaya, & Sawada, 2014).

Different types of consumer buying behavior in group level analysis can be analyzed by some mixture models (Bucklin, Gupta, & Siddarth, 1998). Some mixture models of consumer buying behavior can be used to find latent groups in such a way that customers can be analyzed as a mixture of different types of behaviors (Bucklin et al., 1998). This model has limitations while modeling behavior in dynamic scenarios, such as the case of a consumer buying behavior shifting across different groups. A split-merge approach of a group splitting into smaller groups or customers merging into larger groups may solve the shifting problem.

At the group level model, using a dynamic temporal component can capture the consumer buying behavior changes (Iwata, Shah, & Ghahramani, 2013; Luo, Li, Koprinska, Berkovsky, & Chen, 2016a; Luo, Li, Koprinska, Berkovsky & Chen, 2016b; Li, Zhu, Li, Zhang, , Xue & Wu, 2011; Li, Zhu, Li, & Zhang, 2015). The customer buying behavior segmentation based on mixture models can overcome heterogeneity of customers and avoid the sparse and noisy purchase events of an individual customer models (Kotler & Armstrong, 2010).

The split and merger of groups (Bertoin, 2006) can be analyzed with a Bayesian non-parametric Customer Segmentation Model (CSM), proposed by Luo et al. (2017). This model can be used to track the customer groups through Fragmentation-Coagulation Process (FCP). The FC-CSM facilitates the analysis of customer behavior changes, helps in identification of customer groups, and helps in optimizing the market segments and business strategies.

Market segmentation plays an essential role in the placement of the product on the market. Using variables that are related to consumer behavior, is the key to develop an effective segmentation strategy. Stanton, Etzel, & Walker (2007) define market segmentation as the division of the total market for a product or service in several homogeneous groups of consumers, having similar features. Thus, they will respond more effectively to marketing strategies. Czinkota & Kotabe (2001) in turn, define market segmentation as the process of dividing the market into groups of consumers with different preferences and needs, in order to optimize and concentrate resources within a market.

In market segmentation, it is common to use measurable and identifiable variables that have the ability to bundle consumers into homogeneous groups. There are three approaches to market segmentation. The first is with socio-demographic criteria, using variables such as age, race, sex, and occupation among others.

The second approach is the geographical one, where variables such as country, region and climate, etc. are taken into account.

The third criterion is the psychographic behavior, which includes the variables of attitude, values, goals, personality, and lifestyle, to name a few.

The latter approach, which happens to be the most used by marketers, includes the lifestyle variable, as stated by Vyncke (2002). The lifestyle of the consumer has an influence on both consumer behavior patterns and their reaction on advertisements. The model commonly used for variable lifestyle is the AOI - Activities, Interests, and Opinions. In this field of interest, we study covariates such as activities, highlighting the buying habits in work and vacation. We also look closely at consumer interest in variables such as food, home, fashion, and style and opinions on political, cultural, and social issues. The result of the study conducted by Shukla, Vyas, & Pandya (2015) facilitate retailers to segment shoppers with similar needs and preferences on the basis of age and income.

Another psychographic segmentation model is focused on values, which are understood as the goals and principles guiding the consumer's lives (Vyncke, 2002). The VALS (Values and Lifestyle) model coined by Mitchell (1983) is the most used, as it offers many advantages over the AOI model. The VALS model includes a wider capture range of attitudes and consumer behavior and allows their easy identification.

However, Kotler & Armstrong (1996) note that market segments based on consumer behavior or personality are not sufficient to estimate the magnitude of the target market and reach it efficiently. However, this is required in order to correlate the different variables and segment the market in a more useful and effective way, providing the tools to design better business strategies.

The methodologies applied to multivariate data analysis provide the opportunity to obtain accurate identification and description of the target market. Thus, allowing the company to adapt its business strategy and direct its resources more effectively and accurately. For this study, an array with two demographic covariates was used; one psychographic variable and three behavioral variables.

### **Purchase Behavior**

Consumer behavior refers to the activities shown by the consumer that relate to obtaining, using, and disposing the goods purchased. Loudon & Bitta (1995) state that consumer behavior is the decision-making process, that individuals use when acquiring or consuming goods or services. The factors involved in the buying process of the consumer are essential for developing effective marketing strategies.

Churchill & Peter (2000) confirm that consumer behavior consists of their feelings, thoughts, and actions that influence them and cause changes in their buying habits. However, Richers (1984) noted that the consumer is propelled by emotional activities to choose and buy products that satisfy his or her wants and needs. Schiffman & Kanuk (2000) state that cultural, social, personal, and psychological factors are the main influencers of purchasing behavior.

There are other variables that influence the process of consumer purchasing. According to Bateson & Hoffman (2001), the perceived quality of a product depends on the comparison of customer expectation with said product. Therefore, if the product fails to satisfy the consumer's needs, it is perceived as a low quality product. Similarly, the consumer does not only value the quality of the product based on its outcome. The consumer is also influenced by his opinion on the quality of the service provider, employees, and management of a company.

It is crucial for companies to develop efficient strategies to differentiate product and customer loyalty in order to survive the fierce market competition. The oversupply of products and their standardization makes it an increasingly difficult task for the marketing department to achieve its goals.

One of the strategies used by companies is product differentiation based upon its quality. Dey, Lahiri, & Zhang (2014) have stated that some companies focus on consumers who look at price and others focus on those seeking quality as well. Segments have been conceived for both variables. The quality differentiation provides an alternative to consumers who do not seek products of excellent quality, but who are rather attracted by low prices.

Other companies used their customer's loyalty as a strategy. According to Gupta, Hanssens, Hardie, Kahn, Kumar, Lin, ..., & Sriram (2006), to achieve long-term customer loyalty (Customer Lifetime Value or CLV), for a brand or product, it is essential to maximize the success of the company. Researchers have used various methods to calculate the individual value of each consumer and to make predictions. This also allows segmenting them into groups, such as suggested by Jain & Singh (2002), Gupta & Lehmann (2006), Kim, Jung, Suh, & Hwang (2006), and Han, Lu, & Leung (2012), among others.

*José G. Vargas-Hernandez, Cesar Francisco Cárdenas-Dávila, Elsa Patricia Orozco-Quijano, and Julio Cesar Cenicerros-Angulo*

The segmentation method used by Cuadros & Domínguez (2014) considers three factors: current value, potential value, and brand loyalty. These factors provide information about customer behavior and about how long-term loyalty is a good unit extent that companies can count on for support when making decisions. The study shows that by applying this methodology to a specific group of consumers, it is possible to efficiently characterize and identify the assets of the brand or product to attract new consumers. These assets can then be segmented into pre-existing groups and thus allow the company to retain consumers.

Several authors such as Dubrovsky (2001), Shaw & Gibbs (1999), and Hansen (2001) believe that there is a significant correlation between customer satisfaction and purchase frequency. Obtaining loyalty and an overall positive attitude to the product or brand has a positive impact on product placement and consumer behavior.

### **Logistic Regression Model**

To better understand the structure and nature of the binary model, we consider the theoretical contribution to the Logistic Regression by Hosmer & Lemeshow (1989) in their classic work “Applied Logistic Regression”. The authors explained the reasoning in relation to the expected value of the response variable in a linear function is as follows:

$$(1) E(y/x) = \beta_0 + \beta_1 x$$

It is established that  $(x)$  moves in ranges  $(-\infty y \infty)$ . However, with dichotomous response variables, type ranges are set to  $[0 \leq E(y/x) \leq 1]$ . If,  $\pi(x) = E(Y/x)$ . Therefore, the logistic model is specified as:

$$(2) \pi(x) = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}}$$

Finally, we must define a performed logistic transformation in terms of  $\pi(x)$ , so

$$(3) \phi(x) = \ln \left[ \frac{\pi(x)}{1 - \pi(x)} \right] = \beta_0 + \beta_1 x$$

Complementing the explanation, Ferran (2001), recommend that:

$$\frac{\pi(x)}{1 - \pi(x)} = \frac{\delta}{\lambda} y \phi = \beta_1 x_1 + \dots \beta_p x_p + \beta_0 \text{ also: } \ln \left( \frac{\delta}{\lambda} \right) = \phi$$

$\therefore$  an additional way of presenting the model is:

$$(4) \left( \frac{\delta}{\lambda} \right) = e^{\beta_0} (e^{\beta_1})^{x_1} \dots (e^{\beta_p})^{x_p}$$

We also note that, with respect to  $\eta$ , parameters or coefficients of equation (in general terms) - which are similar to those for Gujarati (2010) - are expressed in terms of the following sub paragraphs:

$$\beta_1 y \beta_2, \text{ thus we have, if: } \ln \left( \frac{P_i}{1 - P_i} \right) = Z_i, \text{ straighten it in the expression \& we get:}$$

$$Z_i = \beta_1 y \beta_2 x_1$$

With the adequate information on these parameters in the function sum, we are likely to interpret the relative importance of each of the original variable of segmentation when shaping the block and the final identification of the covariates of interest.

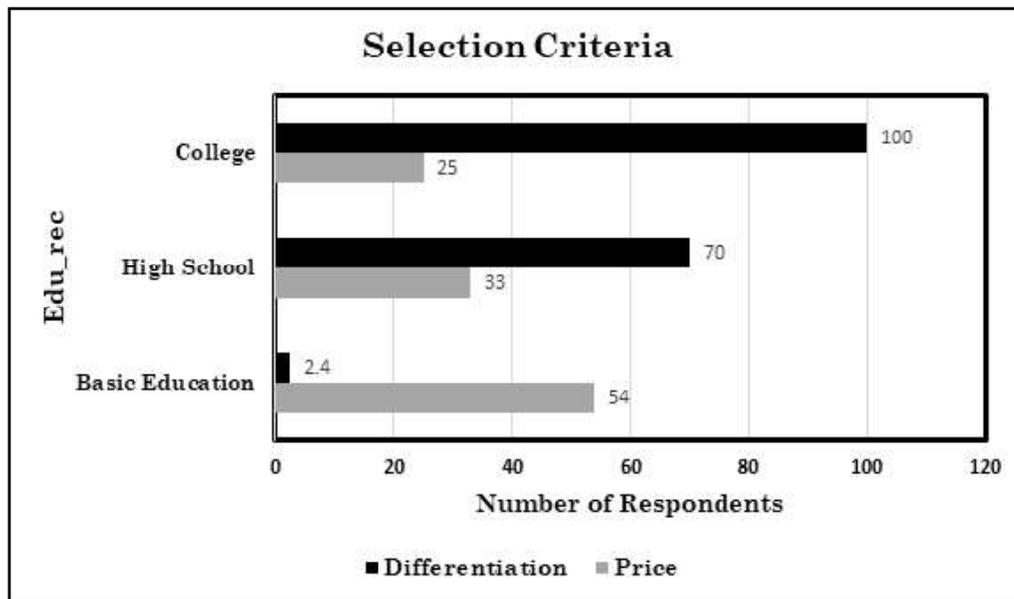
**Analysis Procedure**

For the procedure of identification, evaluation, and selection of covariates of interest, we proceed to the illustration of the educational level variable of the respondents. Then, we must clarify the categorization of this variable. We then proceed to reclassification of the fate variable that allows to reconfigure a cluster consisting of three categories of response: individuals who completed high school level education, individuals completed preparatory level instruction, and finally, individuals who completed undergraduate and/or postgraduate degrees.

The exact observance of the preamble leads to consideration of the following information:

**Table No. 2: Cross Tab. edu\_rec \*selection criteria**

Particulars		Frequency (%)	Selection criteria		Total
			Price	Differentiation	
Edu_re	Basic education	Count	54	60	114
		Total %	15.8%	17.5%	33.3%
	High school	Count	33	70	103
		Total %	9.6%	20.5%	30.1%
	College	Count	25	100	125
		Total %	7.3%	29.2%	36.5%
Total		Count	112	230	342
		Total %	32.7%	67.3%	100.0%



**Figure No. 1: Educational level of respondents**

The paper attempts to answer the questions: whether respondents having higher education make purchase decision on the basis of product differentiation; whether the respondents having basic education make purchase decision on the basis of product price. We have formalized the significance test by the following hypothesis:

$H_0$  : There is no connection between education level of respondents and their criteria for making purchase decision (based upon price and differentiation).

**Table No. 3: Chi-Square Test**

Particulars	Value	gl	Sig. asintotic (bilateral)
Chi- Square Pearson	20.312 <sup>a</sup>	2	0.000
No. of valid cases	342		

The minimum expected frequency is 33.73.

Table no. 3 show that the results are highly significant. Thus, the null hypothesis is rejected and we proceed to select importance of demographic segmentation variable to shape the logistic regression model. To check the appropriateness of the variables in the model, following analysis is done.

**Statistical Hypothesis Testing with the Wald and Bootstrap Procedure for Education**

Before testing the hypothesis of individual significance of the education variable, we proceed to encoding the same as shown in table no. 4.

**Table No. 4: Encodings Categorical Variables**

Particulars		Frecuency	Encoding parameters	
			(1)	(2)
edu_re	Basic education	114	0.000	0.000
	High School	103	1.00	0.000
	College	125	0.000	1.000

As can be seen from the table no. 4, the basic education category is the reference or comparison. Why was this selected as a reference? Since we want to investigate what is the role of education in the criterion of discrimination. It is also part of supposing that those with more education tend to attribute discrimination as the criterion of purchase. Notice how in contrast, the level of school studies is assigned category (1). Finally a professional level code (2).

Now, we need to answer whether the coefficient associated with the variable level equal to zero in the study? In other words, are the independent and dependent variables significantly related? We have formally expressed the null hypothesis as :

$H_0$ : The education variable is not significant in explaining the way in which consumers decide to use binary criteria for purchase.

To have more elements of reliability and enhance the accuracy of the results of hypothesis testing, the bootstrap procedure is performed with a total of 1,000 samples. The results are presented in table no. 5 below:

**Table No. 5: Specifications Bootstrap**

Sampling Method	Simple
Number of samples	1000
Level of confidence interval	95.0%
Type confidence interval	Percentil

input variables Step 1: Educateca.

In table no. 6 & 7, we can observe that there is high significance of the education variable with

**Table No. 6: Variable and Categories in the Equation**

Particulars	B	E.T.	Wald	gl	Sig.	Exp(B)
Step1 <sup>a</sup> Educareca			19.473	2	0.000	
Educareca(1)	0.647	0.282	5.241	1	0.022	1.909
Educareca(2)	1.281	0.292	19.261	1	0.000	3.600
Constante	0.105	0.188	0.315	1	0.574	1.111

**Table No. 7: Bootstrap for Variables in the Equation**

Particulars	B	Bootstrap <sup>a</sup>			Level of confidence interval al 95%	
		Sesgo	Tip Error	Sig. (bilateral)	Inferior	Superior
Step 1 Educareca(1)	0.647	0.012	0.291	0.023	0.077	1.251
Educareca(2)	1.281	0.012	0.295	0.001	0.735	1.903
constant	0.105	0.005	0.186	0.555	-0.247	0.484

respect to purchase decision by customers on the basis of product differentiation. Alternately, the following procedure allows us to construct bootstrap confidence intervals at 95% for testing  $H_0$  of independence between the covariate and the dependent variable. With further analysis, we notice that the coefficients for the Educareca (1) and Educareca (2) variables fall within the respective confidence intervals. Likewise, the  $H_0$  is rejected and leads us to the same conclusion. Considering other variables classified according to Kerin, Berkowitz, Hartley, & Rudelius (2004) in the following dimensions or block segmentation (geographic, demographic, psychographic, and psychological or behavioral) the same procedure is used for the remaining variable segments. Therefore, we are able to present the segmentation matrix and covariates of interest.

**Conclusions**

Table no. 8 show that the matrix of dimensions and covariates are based on a behavioral dimension that contributes more covariates of interest: the expected benefits, the brand awareness, and loyalty towards brand or product.

The demographic dimension favors two variables: education and income. Finally, the psychographic block provides the consumer personality type variable. It is important to remember that this classification was made individually, variable by variable, and once incorporated some of the variables may have been obligated to leave the model.

This brings to light the essential importance of the behavioral characteristics manifested by the consumer in the process of binary discrimination purchase.

From the foregoing, those combinations in table no. 8 are adjusted covariates that were highly significant.

This exercise demonstrates, similarly to the Wald statistic for individual significance (individual importance of a given a covariate), that we find the highest scores in the expected benefits of the product. Therefore, there are two covariates: benefits expected and brand awareness. They form block behavioral or psychological segmentation, which demands further explanation of the differences in the criteria adopted in buying edible oils.

José G. Vargas-Hernandez, Cesar Francisco Cárdenas-Dávila, Elsa Patricia Orozco-Quijano, and Julio Cesar Cenicerros-Angulo

**Table No. 8: Block Segmentation and Variables**

COVARIABLES	Blocks (Segmentation Dimensions)			
	Demographics	Psychographic	Behavioral	
Education Level	$\chi^2$	20.312		
	Sig. $\chi^2$	0.000		
	Waid	19.473		
	Sig. Waid	0.000		
Income Level	$\chi^2$	20.161		
	Sig. $\chi^2$	0.000		
	Waid	18.102		
	Sig. Waid	0.000		
Personality type		$\chi^2$	13.428	
		Sig. $\chi^2$	0.020	
		Waid	12.676	
		Sig. Waid	0.027	
Expected profits			$\chi^2$	74.109
			Sig. $\chi^2$	0.000
			Waid	55.086
			Sig. Waid	0.000
Brand Awareness			$\chi^2$	24.441
			Sig. $\chi^2$	0.000
			Waid	22.18
			Sig. Waid	0.000
Brand Loyalty			$\chi^2$	12.958
			Sig. $\chi^2$	0.000
			Waid	12.574
			Sig. Waid	0.000
Total Block covariates	2	1		3

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José G. Vargas-Hernandez, Cesar Francisco Cárdenas-Dávila, Elsa Patricia Orozco-Quijano, and Julio Cesar Cenicerros-Angulo

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