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From Market Segmentation to Customer Loyalty

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Abstract

Customer satisfaction and customer loyalty are indicators of competitiveness for companies. In this work we considered the analysis of the relationship be- tween satisfaction and loyalty through a logistic regression model. We also related the results in a market segmentation model based on a latent class analysis that considered responses to value items. Through a survey the results of this latent class model made it possible to evaluate the dynamism of belonging to different classes based, for example, on affinity with altruistic and self realization values.

Keywords: multidimensional loyalty, values, customer satisfaction, sample survey

1. Introduction

The studies of market segmentation (Kamakura & Wedel, 2000) and customer loyalty (Oliver, 1999) concerned different perspectives of analysis in the marketing literature. The interesting perspectives of market segmentation can be integrated with the study of the change in consumer purchasing behavior (Wieringa & Verhoef, 2007) in an integration perspective analyzed in a previous study (Steenkamp & Hofstede, 2002; Montinaro, Dal Forno, Lo Presti, & Sciascia, 2009). These analyzes are also interesting if interpreted considering the new market opportunities for consumers (Swaminathan et al., 2018) also analyzing the synergies between stores and organization in consumer communication (Singh et al., 2019), (Wongtada et al. 2012). Probabilistic models considered the consumer choice (Kamakura & Russell, 1989) and Bayesian analysis has been applied to the study of consumer psychology (Wedel & Chen, 2020), to cite statistical approaches. The new perspectives of online consumer activities (Srinivasan et al., 2016) and the moderator role of the shopping experience on the value of buying (Ligas & Chaudhuri, 2012) have been studied and customer acquisition thanks to online markets (Maier & Wieringa, 2020) have been considered in the recent marketing literature.

The role of brand loyalty is frequently investigated for develop customer communication strategies. Knowing how a brand attracts loyalty is a competitive factor and then the measurements methods for evaluating it have long been developed. In several studies different antecedents of brand loyalty have been considered (Anderson & Srinivasan, 2003), such as brand behavior, customer loyalty, customer satisfaction as characteristics concepts of competitiveness (Augustin & Singh, 2005). Starting from the original work on market complexity reduction (Smith, 1956), our previous different studies tried to connect marketing variables as brand loyalty and market segmentation (Montinaro et al., 2009), (Montinaro & Sciascia, 2011), (Sciascia, 2022). An interesting perspective of interdependence of these concepts concerned the e-commerce (Anderson & Srinivasan, 2003), and the changes in preferences derived from customer loyalty antecedents (Augustin & Singh, 2005). Also the attitudinal and behavioral aspects have been studied (Bandyopadhyay & Martell, 2002) up to the relationship between brand trust and brand effect to brand performance considering the role of brand loyalty (Chaudhuri & Holbrook, 2001).

Brand loyalty measurement had a long literature (Day, 1969), (Jacoby & Chestnut, 1978) originally on the concept of brand loyalty based on two dimensions (Dick & Basu, 1994) and suggested approach of consumer loyalty not even based only on the brand loyalty. The consumer purchase behavior and loyalty can be based on responses on loyalty programs (Liu, 2007) and tactical and strategic roles of customer satisfaction measurement toward loyalty can be important business instruments (Montinaro & Sciascia, 2011). An interesting study develops the concept previous suggested (Day, 1969) with more complex categories (Oliver, 1999), based on four kinds of loyalty, cognitive loyalty, affective loyalty, conative loyalty, action loyalty.

Market segmentation can be linked to customer loyalty (Montinaro & Sciascia, 2011) and a research (Wieringa &

Verhoef, 2007) considered the switching behavior between market segments based on loyalty antecedents. The market segments have been considered (Brangule-Vlagsma et al., 2002) modelling the dimensions dynamics derived from values, while (Carman, 1978) described the relations between values and consumption pattern, described the values changes, and studied the economic security and value changes (Inglehart & Abramson, 1988) and described the swithcing behaviour (Wieringa & Verhoef, 2007). In an interesting research the authors proposed a model for the value segmentation (Kamakura & Mazzon, 1991) and then pointed out the list of values (Kamakura & Novak, 1992), considering the segmentation schemes based on list of values and values and life styles (Novak & MacEvoy, 1990), based on the original work on the human values (Rokeach, 1973) and the changes in values (Rokeach & Ball-Rokeach, 1989). Starting from the original work on market segmentation (Smith, 1956) and the antecedents of customer loyalty (Chaudhuri & Holbrook, 2001) we suggested in a previous work the issue on the different kinds of market segmentation connected to customer loyalty (Montinaro & Sciascia, 2011).

Regarding recent trends in marketing research and the role of customer satisfaction and market segmentation, relevance has been given to business in e-commerce (Swaminathan et al. 2018), the role of the organization in customer satisfaction (Singh et al. 2019), the customer satisfaction affinity (Wongtada et al. 2012), Bayesian statistical methods of market analysis (Wedel & Chen,2020), traditional marketing activities and online purchases (Srinivasan et al. 2016), in-store experience and customer satisfaction (Ligas & Chaudhuri, 2012), online purchases in different sites (Maier & Wieringa, 2020).

We have concentrated in this work an adaptation of previous research that used the assessment of values (Rokeach, 1973), (Novak & MacEvoy, 1990). We proposed a framework which jointly analyzes these constructs considering the dynamism of the segments based on the values as already evaluated in the literature and proposing a complementarity between constructs considered antecedents of brand loyalty.

2. Data Description

The data source is a survey based on a questionnaire. The sample of respondents is constituted by ninety students of Political Science at University of Torino, attending to different courses of Statistics. The dependent variable of interest is the attitude toward mobile phone purchase. It appears in the survey in the form of twelve questions presented to the subjects, designed ad hoc, in order to take into account the four loyalty phases (Oliver, 1999). Depending on the answers provided by the subjects, they are considered in the proper phase of loyalty.

The questionnaire is composed by four sections. The first part involves socio-demographic items related to constructs such as age, households, accomplished study, etc. In the second section the list of values involves a re-elaboration of the Rokeach values (Rokeach, 1973), in order to be more suitable to the subjects. The third section involves two kinds of persistence, that is, persistence on the purchase and on the brand. Finally, the last section focuses on loyalty categories. The sections on list of values and loyalty of the survey are presented in Table 1. They contains a summary of the construct that each question represents, according to its content. For the sake of brevity, we do not report the socio-demographic section and the purchase and brand persistence section.

Table 1. Questionnaire

Items	Construct
Rank in order of importance the following list of values	List of values (*VL*)
Friendship	*VL*1
Love	*VL*2
Study or job	*VL*3
Family	*VL*4
Sport or hobby	*VL*5
Self-respect	*VL*6
Social recognition	*VL*7
A world at peace	*VL*8
A comfortable life	*VL*9
Self-realization	*VL*10
Forgiveness ability	*VL*11
Equality	*VL*12

Items	Construct
Consider the last mobile you chose. (1=*yes*; 0=*no* for all the following items)	Customer loyalty (*CG*; *AF*; *CN*; *AC*)
Would you switch brand for a mobile with the same performance and price?	*CG*1 (cognitive 1)
Would you switch brand for a mobile with the same performance and lower price?	*CG*2 (cognitive 2)
Was your purchase good?	*CG*3 (cognitive 3)
Did you buy it regardless of price?	*AF*1 (affective 1)
Is your mobile brand prestigious?	*AF*2 (affective 2)
You do like your mobile, but would you buy a different brand because of better performance?	*AF*3 (affective 3)
Would you repurchase a mobile of the same brand?	*CN*1 (conative 1)
Are you satisfied by your mobile use?	*CN*2 (conative 2)
Do you intend to keep buying this brand?	*CN*3 (conative 3)
Would you repurchase it because you are oriented to this brand?	*AC*1 (action 1)
Would you even pay an higher price to repurchase the same brand instead of other brands?	*AC*2 (action 2)
Would you wait for some weeks if the same brand mobile were non immediately available, instead of buying a similar available one but of different brand?	*AC*3 (action 3)

A first descriptive analysis of the list of values displays the ranked values for the considered sample. Family, love, and friendship have been shown as the most important values, while sport/hobby, a comfortable life, and forgiveness ability as the least. For our estimation analysis we consider exclusively the first six values in order of importance.

3. Data Analysis

After we defined the constructs of the survey and gathered the results, we analyze the data in five main steps. First, we define two indexes, denoted $A1$ and $A2$ respectively. Index $A1$ summarizes brand persistence, while index $A2$ summarizes behavior purchase persistence: they can assume integer values from 0 to 3, depending on the persistence of the answers given in section three of the questionnaire, representing the four different segments of the partitions.

Second, with those two indexes we perform two different partitions of the sample in four segments each, in order to be compared. The segment sizes of each partition are different, as we report briefly in the following. The number inside the parenthesis is the number of subjects belonging to the respective segment. With respect to index $A1$: no persistence (62), low persistence (17), moderate persistence (6), high persistence (5). With respect to index $A2$: no persistence (43), low persistence (21), moderate persistence (17) and high persistence (9).

Third, we estimate logistic regression models, respectively with indexes $A1$ and $A2$ as dependent polytomous variables, and the first six top-rank Values as explanatory variables. These models attempt to explain subject loyalty dependently on the partition considered.

Fourth, we define two loyalty indexes LY , which can assume integer values from 1 to 4, depending on the loyalty classification answers given in the last section of the questionnaire. They differs uniquely in case of parity outcome because then the strongest and the weakest class of loyalty are respectively considered. For this reason, in the following, for sake of simplicity we refer to both as index LY without risk of ambiguity.

Finally, since in the logistic regression we assume no heterogeneity on the effect of the explanatory variables, we employ latent class analysis (LCA), using loyalty indexes LY as dependent variable both to consider heterogeneity and to accommodate the possible existence of loyal segments with differential effects of the six top-rank Values.

4. Empirical results

4.1 Logistic Regression

The different partitions of the sample we perform are respectively S_1 related to index $A1$ and S_2 related to index $A2$. In both cases the number of classes of loyalty considered is $M = 4$, and the vector of characters possessed by individual i is

$$\mathbf{u}_i = (VL1_i, VL2_i, VL3_i, VL4_i, VL6_i, VL10_i)$$

where each component VLj_i is subject i's rank of Value j among those we are considering. In modeling brand persistence and behavior purchase persistence, we estimate the following logistic regression equation to explain the potential segment class membership:

$$P(A_k = s)_i = \frac{exp(z_{is})}{1 + \sum_{s'} exp(z_{is'})}, \; s = 0, \ldots, 3 \tag{1}$$

where $P(Ak = s)_i$ is the probability that respondent i exhibits a behavior as described by class s of partition S_k, z_{is} is a linear combination of the explanatory variables:

$$z_{is} = \beta_{0is} + \Sigma_j \beta_{js} \cdot VL_{ji} + \varepsilon_i \quad (2)$$

and the error term ε_i follows the standardized logistic distribution with mean zero.

We recall that the values of the explanatory variables indicate the rank position in the list of Values. Therefore, the smaller the value the strongest the preference for that item. Considering the sign of the coefficients, our results show that, with both the indexes $A1$ and $A2$, higher preference for love (i.e., smaller $VL2$ value) relates to low probability of membership. On the contrary, higher preference for family (i.e., smaller $VL4$ value) has a positive effect on the probability of membership. Higher preference for self-realization (i.e., smaller $VL10$ value) decreases the probability of membership in the partition obtained with index $A2$, while it has the opposite effect in the partition obtained with index $A1$. Higher preference for self-respect (i.e., smaller $VL6$ value) relates to low probability of membership when considering index $A1$.

4.2 Latent Class Analysis

There are many reasons one might expect individuals to differ in assign preference in a same system of Values. Analysis that ignores these unobservable individual differences may produce a biased assessment of system Values priorities. In the Latent Class Analysis we take into account subjects heterogeneity considering the loyalty index LY. The aim is to assign a class of loyaltyto each subject in the population, according to the loyalty classification. Consider index LY as dependent variable.

Approximately 40% of the respondents indicate that they are loyal in an *action* sense, 28% in a*cognitive* sense, 23% in a *conative* sense, and the remaining 9% can be related to the *affective* class of loyalty.

The vector of characters possessed by individual i is now

$$\mathbf{u}_i = (VL1_i, VL2_i, VL4_i)$$

where each variable VL_{ji} is still subject i's rank of Value j among those we are considering. We consider for the analysis the first three preferred Values.

In general, a logit model with M latent classes can be formulated as

$$P(LY_i = s) = \sum_{m=1}^{M} p_s \Lambda\,(\boldsymbol{u}_i \beta_m) \quad (3)$$

where $P\ (LY_i = s)$ indicates the probability that individual i has loyalty level s, $\mathbf{u}_i$ is the vector of explanatory variables, β_m is a vector of regression parameters for segment s, and $\Lambda(\ )$ isthe cumulative logistic distribution function. In the case we are examining, $\mathbf{u}_i\beta_m$ for segment $m = 1,\ldots,M$ equals

$$\mathbf{u}_i\beta_m = \beta_{m0} + \beta_{m1} \cdot VL1_i + \beta_{m2} \cdot VL2_i + \beta_{m4} \cdot VL4_i$$

We select three loyalty classes: low, moderate, and high loyalty. We chose the three-class model, because we think that for this exploratory research three levels of loyalty well fit our purpose. We considered also information criteria as Akaike's information criterion (AIC) and the Bayesian information criterion (BIC) but, since their values are increasing, we follow our assumption on a three-class bases.

We can see that, considering three classes of loyalty, Class 1 (high loyalty) size is 61.18% of the sample, while Class 2 (low loyalty) and 3 (moderate loyalty) consist of 33.91% and 4.91%, respectively. Focusing on the high loyalty class and examining the value trend we can say that generally, for this class, the membership probability decreases as Values $VL4$ (*family*), $VL1$ (*friendship*) and $VL2$ (*love*) decrease. This means that this probability is affected by a loss of importance in these Values, even if with different peculiarities. For example, keeping fixed two of the considered Values and making *family* to vary, when in top ranking the membership probability is 0.66 while is 0.50 when at the bottom; therefore, the effect is not so significates. On the contrary, when the *friendship* ranking varies the membership probability shifts from 0.71 to 0.33. This phenomenon is even more visible when the *love* ranking varies: the probability drops from 0.76 to 0.43 already in the mid ranking.

According to Oliver (1999) loyalty phases, Class 1 could aggregate the last 3 loyalty categories (*affective*, *conative*, *action*), Class 2 could aggregate the first 3 loyalty categories (*cognitive*, *affective*, *conative*), Class 3 could aggregate the median categories (*conative* and *action*).

Marketing action might follow the indications about the explanatory variables parameters estimated in the two logistic regressions. There a posteriori segmentation, estimated with latent class analysis, involves the loyalty index. Marketing actions will focus more deeply on knowledge about the customers involving attitudes. Further research may concern the comparison between the two data analysis steps. Using the same set of explanatory variables we will be able to compare different results to better relate purchase behavior, Value systems and customer loyalty. Considering the loyalty premises we can identify Segment 1 as the *high* loyalty class, Segment 2 as the *low* loyalty class, and Segment 3 as the *moderate* loyalty class.

4.3 Correlation Analysis

We used the summary manifest variables BL (A1, A2), LY, and Class to consider the partial correlations and the results are described in Table 2.

Table 2. Partial correlation.

	Controlled by	*correlation*	*p−value*
LY Class	*BL*	0.328	0.021
LY BL	*Class*	0.0922	0.505
BL Class	*LY*	0.3089	<0.001

5. Discussion

In this article we analyzed the fundamental concepts for brand and market research using a survey to try to connect variables that derive from market segmentation and customer loyalty in a structured framework. The work starts from the analysis of the literature on values with an adapted proposition of analysis questionnaire (Rokeach, 1973). This work aims to find interdependence on manifest variables based on Values, by means of logistic regression models, latent class analysis and partial correlation analysis. This might be helpful to understand consumers purchase behavior and loyalty attitude towards brand.

The relationship between system of Values and customer loyalty is investigated through the definition of three new constructs: behavioral brand and purchase persistence indexes, loyalty indexes, and a Rokeach survey (adapted to 12 Value categories instead of 18 as in the original). Customer loyalty has been studied focusing on mobile phone market. We designed a questionnaire administered to a sample of ninety undergraduate students attending to different coursesof Statistics at University of Torino.

The administration of the questionnaire makes it possible to collect information relating to the attitudinal and behavioral aspects of brand loyalty in relation to the answers to the section of the questionnaire relating to Values; in addition, a model of segmentation in relation to Values is considered. The analysis allows an evaluation of the behavioral aspects through logistic regression and evaluation of the segmentation through latent class analysis. The summary variables are then considered in its partial correlations and an overall framework is then implemented through correlation analysis.

First, we linked Values to the behavioral indexes of brand and purchase persistency by means of logistic regression. The analysis involved only the effect of the six top-rank Value categories, according to the classification given by the considered sample, that is, *family*, *love*, *friendship*, *self-respect*, *study/job*, and *self-realization*. We can consider the first three Values as *altruistic*, while the last three can be seen as *selfish* Values. All those categories were used as predictor variables in the logistic regression, while behavioral indexes $A1$, $A2$ are the logits, describing the total contribution of the system of Values used in the model. Behavioral indexes allowed us to partition naively the sample.

Considering brand persistency (index $A1$), the analysis proves that a high preference for *love* relates to a low probability of membership when the persistence class is low-moderate. This is the Value with the strongest influence on the membership probability. On the other hand, high preference for *family* provides a positive effect on the probability of membership. High preference for both *friendship* and *self-realization* increase the probability, *study/job* has a very small effect, while *self-respect* has a negative influence on the probability. This index can be considered as a behavioral loyalty index, since it describes the subject's history of owned mobile phone brand.

Considering purchase persistency (index $A2$), the analysis proves that *family* increases the membership probability of a low-moderate class of persistency, and *love* effect is almost null. High preference for *friendship* and *self-respect* has a moderate positive influence, for *study/job* is almost null, while a moderate negative effect can be attributed to *self-realization*.

With indexes $A1$ and $A2$ we analyzed a behavioral concept of loyalty based on repeated purchases. As a second step we deepened the analysis by an attitudinal perspective defining loyalty indexes LY. The two indexes LY are provided by the loyalty items in the questionnaire. We obtained two partitions of the sample, considering respectively the strongest and the weakest class of loyalty whenever a case of parity turned out.

With latent class analysis we focused on the link between the three altruistic Values already used in the logistic regression and the loyalty indexes. We chose to consider uniquely those Values because, accordingly to the previous analysis, they seem to have the greater influence on the probability of membership. Unlike the regression technique, some a priori assumptions about the number of classes were in order. We decided to consider a sample partition in three potential classes of loyalty: low, moderate, and high. This way, we intended to modify the rigidity of Oliver classification and spread the concept of loyalty into something similar to a continuum space.

The analysis provided the high loyalty class as the largest (61.18%), then the moderate loyalty class in the middle (33.91%) and the low loyalty class as the smallest (4.91%). Considering uniquely three Value categories we could describe the results keeping alternatively fixed two variables on the sample average and making the third to vary. This way we had the following results about the probability of membership of low and high loyalty classes. *Friendship*: in the high loyalty class the probability increases together with the preference for the Value; the opposite happens in the low loyalty class. *Love*: in the high loyalty class the probability steeply increases moving from rank 8 to rank 6, and then smoothes until top position; the low loyalty class is peculiar, since we could observe an increasing of the probability from rank 8 to rank 6 (where there is a maximum), and then a decreasing. *Family*: in the high loyalty class the more the Value is preferred the higher is the probability of membership; the opposite can be observed in the low loyalty class. Even if *friendship* and *family* exhibit similar qualitative results (they are all monotone curves), some quantitative considerations are in order. When considering friendship the probability of membership varies respectively in the range (0.33, 0.71) (high loyalty class) and (0.29, 0.66) (low loyalty class), while when considering family, the probability varies respectively in the range (0.5, 0.67) (high loyalty class) and (0.35, 0.5) (low loyalty class).

The moderate loyalty class is characterized by a negligible increasing trend of the probability of membership for both *friendship* and *family*, but when considering *love*, it is constantly close to probability one moving from rank 12 to rank 8, then it falls down to zero from rank 8 to 6, where it constantly remains up to top rank of preference.

The results obtained with the logistic regression model, focusing on the relationship between the altruistic Values and the behavioral loyalty indexes, provided opposite outcomes. In fact, while the probability of belonging to a low-moderate persistency class increases together with an increasing of the preference of *family* and *friendship*, with the latent class analysis, that considers attitudinal loyalty indexes, we observe the opposite effect. The segment size in the a priori partition obtained with behavioral indexes $A1$ and $A2$ increases moving from cognitive to action loyalty, that is, the larger class consists of people who exhibit a weak loyalty behavior (68.89% for index $A1$) and the smaller is the high loyalty individuals (5.56% for index $A1$); while there a posteriori partition obtained with attitudinal index LY proves that high loyalty class is the larger (61.18%) and the moderate loyalty class is the smaller (4.91%).

After considering summary variables, we performed partial correlation analysis inserting these variables into a structural model measurement. We note in Table 2 that the best correlations are between the Class and the other two variables suggesting an important role of the market segmentation models.

5.1 Managerial Implications

This work, even if exploratory, may provide interesting suggestions to managerial practice: firstly, because it focuses on Value categories well known in the Psychological literature, and which proved to be helpful to understand consumers' behavior; secondly, because it analyzes the link between loyalty and system of Values concepts. Furthermore, it takes into account consumers' behavioral and attitudinal aspects together with the most preferred Value categories, accordingly to the classification provided by the sample considered. We performed a priori segmentation technique (logistic regression model) through the definition of indexes, and analyzed the sample by means of a posteriori classes of loyalty (LCA).

The exploratory analysis we performed can hardly be generalized, due to the small size and heterogeneity of the sample. However, interesting implications may come from the adaptation of Values proposed by Rokeach, in order to analyze how they affect the probability of membership to classes of loyalty which can be spread in a continuum from no loyalty to high loyalty. Our choice of considering three classes of loyalty may result to be reductive. Naif segmentations are based on the definition of indexes that might be improved by the management at will. These indexes are defined accordingly to the questionnaire items, therefore the questionnaire too, might be improved in order to better understand consumers' behavioral and attitudinal purchase. Furthermore, we considered only six Values in the logistic regression model and three in the latent class analysis: we are aware that this is reductive, however it has to be set in an exploratory background.

A lively management might order a research based on the original 18 Rokeach categories. This way, the separation between altruistic and egoistic Values might lead to more interesting results about the effect on the probability of membership to new classes of loyalty. Since one of the management goals is consumers' loyalty, system of Values together with loyalty measurement, and statistical techniques which allows for analyzing the link of these two constructs are, in our opinion, significative aspects deserving managerial consideration. A strategic analysis might involve dynamics shifting of consumers from low towards high loyalty classes: what is the effect of the Values on the stay in a class? what is their effect on the leaving and on the return? what is their influence of the consumers' shifting from a moderate to a high loyalty class? and also to a low loyalty class (less pleasant to the management, but certainly not less interesting)? For all these reasons the dynamics aspect in the analysis of the link between system of Values and loyalty has not to be neglected.

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