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Full Length Research Paper

Psychographic measure of service quality of fastfood chain in Davao city

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Consumer behavior and consumer preference are two different but related areas in marketing. This study was conducted to develop a construct of service quality in the fastfood chains. Demographic characteristics of the respondents were interacted to simulate effects on the perceived quality of service. A total of 417 respondents participated in the study. Most of the respondents were in their teens or early 20's, of these, most were female students. An exploratory factor analysis revealed six components explaining service quality. These were physical setup and prompt service, cheerfulness of the service crew; food selection and food display; staff knowledge of the product and the prices of it; and finally, the accessibility to the place. Further, ordinal regression indicated no statistical characterization of the respondents according to age, sex (male or female), and occupation (working or student) to indicate particular preference of services offered by an establishment. This suggests that preferences of food chain are influenced by the fastfood's crews attending with promptness; affordability of the food and its variety; and that the establishment is readily accessible to the eating public.

Key words: Service quality, factor analysis, ordinal regression.

INTRODUCTION

Meeting the needs of the customer remains the primary objective of the firm in order to stay in the business. Some business executives ensure that meeting the customer satisfaction is not on its minimum, but even ensure to make them delighted. (Intellicare, 2011).

The objective to meet customer's satisfaction is embedded in a company's vision-mission. This is translated into the narrow activities of the business, in the intra-corporation human relations, and in the direct interaction of the company to its customers. Some firms even venture into calling personally their customers to determine whether the right products were delivered, whether the service staffs were courteous and grateful during the visit of the costumer. This is evident in the service infrastructure for cars of Jagdish Khattar in India (Bhandari, 2009).

Service quality is defined as what the customer gets from what the customer is willing to pay for as compared to what the sellers place on the product (Aykac, 2009) citing Ducker (1991). This means that the costumer is making a comparison between what the costumer expects to receive with what the customer is receiving in actual. Therefore, a satisfied customer means that the service is considered as quality service.

This study employed exploratory factor (EFA) analysis to show customer satisfaction as appraisal of the service quality of fast food establishments in Davao City. EFA is a statistical tool to determine the factor structure that was not theoretically established (Cudeck, 2000). These factors were then evaluated using ordinal logistic regression to determine the probability of measure of choosing the high or low scale thresholds of the customer. The coefficient value will indicate how the characteristic of the respondents influences the service satisfaction on the component of service quality of the fast food chains.

METHODS

In this study, the data gathering, the sample technique, the exploratory factor analysis and the subsequent ordinal regression estimation were discussed.

Data

The study employed a 31-question survey tool administered to 417 respondents. The study employed a convenience sampling given that it is assumed that almost everybody ate in a fast food chain. The survey tool is a 5-point Likert-type scale with scale 5 indicating very high level of service satisfaction on the services of the fast food chain, while 1 is the lowest.

Factor analysis

The exploratory factor analysis (EFA) was used to determine a construct on the service quality. The study employed the principal component analysis (PCA) method so as to summarize information of several variables into smaller weighted composites. In order to address the matrices that will describe the data, an Orthogonal Rotation Method was used. This method restricts the factor to be uncorrelated.

After obtaining the constructs that describe the service satisfaction which is an appraisal of the service quality of the establishment, the characteristics of the respondents were evaluated to establish relationship with the scale choice threshold obtained from the EFA. The ordinal regression method was the appropriate tool as it is a model approach of the logistic regression family with a dependent variable using scale value.

The dependent variable in the study will be the ranked-scale choices of the components that explain service satisfaction. It is important to obtain coefficient values that will indicate the likelihood of choice on a specific scale.

The ordinary logit fall short of this requirement, thus it is necessary to extend into the single weight vector of a regularized logistic regression (RLR) with the minimization objective given by Rennie (2005) as:

$$J_{RlR} = \sum_{i=1}^{n} \log(1+\exp(-y_i \bullet \vec{x}_i^T \vec{w})) + \frac{\lambda}{2}\vec{\omega}^T\vec{\omega})$$

Where $\{\vec{x}_1,...,\vec{x}_n\}, x_i \in \Re^d$, are the covariates and $\{y_1,...,y_n\}, y_i \in \{+1,-1\}$, are the scale choice threshold labels. The approach can be extended to multiple ordinal labels of a single weight vector of the segment in the real line of l sections. Rennie (2005) employed $l-1$ thresholds, where the $\{\theta_1,...,\theta_{l-1}\}$ represent the segment. The θ_0 and θ_1 denote $-\infty$ and $+\infty$ in that order and the label $k \in \{1,...,l\}$ corresponding to the segment (θ_{k-1}, θ_k).

In this study, segments refer to the degree of service satisfaction of the costumers of fast food chain.

Fixed margin formulation for ordinal classification

The $h(z) := \log(1+\exp(z))$, of the minimization objective for the immediate threshold version of ordinal logistic regression in the format of:

$$J_{\mathrm{Im}\,m} = \sum_{i=1}^{n} h(\theta_{y_{i-1}} - \vec{x}_i^T\vec{\omega})) + \frac{\lambda}{2}\vec{\omega}^T\vec{\omega},$$ where the

$h(\theta_0 - \vec{x}_i^T\vec{\omega}) = h(\vec{x}_i^T\vec{\omega} - \theta_l) = 0 \forall i, \vec{\omega}$.

Note that the h is defined so that scale choice thresholds appear oriented as on the real number line with respect to the covariates of the study.

All-threshold and immediate threshold formulation

In comparing the approach for the threshold formulation, that is using the immediate threshold or the all-threshold formulation, it was determined that the all-threshold is preferred than the former.

The immediate–threshold formulation lacks the ability to guarantee the ordering of the threshold. While thoughtfully defined, the optimal parameter setting indicates a category such that it is necessary to have some $i < j$ ordering of the vector so that the $\theta_1 > \theta_j$ thresholds hold true.

On the other hand, the all-threshold approach imposes penalties to ensure order, $\theta_1 \le \theta_2 \le ... \le \theta_{l-1}$. This implies that the formulation ensures a category of order for the scale choices. This means that the Scale choice 1 is lower than Scale choice 2 and that Scale choice 2 is lower than 3, and so on.

Then the functions $h(z)$ and $g(z)$ are defined as $h(z) := \log(1+\exp(z))$. The minimization objective using the all-threshold formulation is given as:

$$J_{All} = \sum_{i=1}^{n}\left[\sum_{k=1}^{y_i-1} h(\theta_k - \vec{x}_i^T\vec{\omega} + \sum_{k=y_i}^{l-1} h(\vec{x}_i^T\omega - \theta_k\right] + \frac{\lambda}{2}\vec{\omega}^T\vec{\omega}$$

Then, taking the partial derivative with respect to each weight of the vector

$$\frac{\partial J_{All}}{\partial \omega_j} = \sum_{i=1}^{n}\left[\sum_{k=y_i}^{l=1} x_{ij} g(\vec{x}_i^T\vec{\omega} - \theta_k) - \sum_{k=1}^{y_i-1} x_{ij} g(\theta_k - \vec{x}_i^T\vec{\omega})\right] + \lambda\omega_j$$

Ordinal model

The ordinal logistic model is given as $\ln(\theta_j = \alpha_j - \beta X)$ where the j goes from 1 to the number of the categories minus 1.

A negative sign of the predictor variable determines that the larger coefficients indicate an association of the larger scores. While a positive coefficient value of a dichotomous factor means that the higher scores are more likely for the first category. Also, a negative coefficient tells that the lower scores are more likely.

On the other hand, a continuous variable with a positive coefficient tells that as the values of the variable increase, the likelihood of larger scores also increases. This would mean that an association with higher scores would result to smaller cumulative probabilities for lower scores, since lower scores for the scale choice are less likely to occur. Each logit has its own α term but the coefficients β_s are the same. The effect of the independent variable is the

Table 1. Profile of respondents.

Age	Frequency	Percent
Ages 14-19	143	34.3
Ages 20-25	228	54.7
Ages 26-30	29	7.0
Ages 31 and above	16	3.8
Missing	1	0.2
Total	417	100.0
Sex		
Male	202	48.4
Female	215	51.6
Total	417	100.0
Occupation		
Student	248	59.5
Working	168	40.3
Missing	1	0.2
Total	417	100.0

same for different logit functions. In this case, the α_j terms are known taking the threshold values, which values depend on the values of the independent variable for a particular case. Note however α_{j_s} is like the intercept in a linear regression with their usefulness on the calculations of the predicted values.
The empirical of model of the study is therefore:

$$\ln(service\_qual = \alpha_j - \beta_1 X_{age_i, sex_i, occupation_i})$$

Where age, sex an occupation take categorical values.

FINDINGS

Presented in this findigs are Measure of Sampling Adequacy, the Test of Sphericity using Bartlett's test, the Factor Component and the Parametric Analyses.

Profile of respondents

Most of the respondents were young adults, 228 (54.7%) ages 20 to 25 years old. While teenagers follow in tow, with 143 (34.3%) ages 14 to19 years old. There were 29 (7%) were in their late 20's and a marginal 16(3.8%) ages 31 and above. Of these, 215(51.6%) were females and 202 (48.4%) were males (Table 1).

However, of these respondents, more than half, 248 (59.6 percent) were still students and 168 (40.3) were already working. Thus, descriptively, the fastfood goers were commonly females in their teens or early 20's, and were still students.

Measure of sampling adequacy and test of sphericity

The measure of sampling adequacy (MSA) is determined using Kaiser-Meyer-Olkin (KMO) statistics. It predicts whether data were likely to factor well based on the correlation and partial correlation. Its values ranges from 0 to 1 where a value of 0 indicates diffusion in the pattern of correlation in which would render factor analysis useless (Field, 2005).

A KMO near 1 signifies a pattern for correlations that are relatively compact which will provide reliable factors. In general, a KMO coefficient must be greater than 0.50. Literatures indicate that KMO values between 0.5 to 0.7 were mediocre; values between 0.7 to 0.8 were considered good; and values between 0.8 to 0.9 were great; while values above 0.93 were deemed superb, with the latter suggestive of strong confidence that factor analysis fit for the data.

The factors are compact enough to yield unique factor analysis of the customer satisfaction of the servive quality of the fastfood chain (KMO = 0.960) (Table 2).

The Bartlett's test also determined the identity matrix. If the correlation matrix is an identity, then there will be no relationships among the factors to be analyzed because the correlation coefficients are equal to zero. Therefore, if the Bartlett's test is significant ($p<0.05$), then a relationship of the factors can be obtained from the data. The test indicated that correlation matrix is not an identity (chi square = 7633.22). This would confirm that the factors show association to explain the service quality satisfaction.

The six factor loadings (Table 3) describe the customer satisfaction of the services of the fast food chains. These

Table 2. KMO and Bartlett's test.

Test	Values
Kaiser-Meyer-Olkin measure of sampling adequacy	0.96
Bartlett's test of sphericity (chi-square)	7633.222*

Significant at 0.05 α.

Table 3. Factor loading of the service satisfaction of fast food chain customers in Davao city.

Indicators	Service quality in terms of ensuring effective physical appearance	Service quality in terms of ambiance, merchandise	Service quality in terms of staff services, food, promotions	Service quality in terms of price, access, and business hours	Service quality in terms of availability of crew	Over-all dining experience
Service staff was available in a timely manner.			0.522			
The promotional activities are persuading			0.678			
Staff was friendly and cheerful throughout.			0.745			
Staff showed knowledge of the products/services.			0.599			
Advertisements of the establishments are entertaining			0.644			
The food is the best for its price				0.592		
Easy access going to the food establishment				0.641		
Waiting for the service crew is just long enough					0.555	

Table 3. Contd.

Stores are conveniently located			0.692		
Store hours are convenient for shopping needs.			0.687		
Store atmosphere and decor are appealing.		0.557			
A good selection of food was present.		0.578			
Store has the lowest prices in the area				0.77	
The ambiance is good		0.59			
Merchandise displays are attractive		0.672			
Advertisement of the establishment is good		0.686			
The whole crew is concern of the satisfaction of the clients	0.517				
Customer satisfaction is evidently given importance	0.66				
Customers feel that service crew strive to satisfy customer needs	0.67				
The reputation of the company is good	0.617				
The place is clean and appropriate for dining	0.736				
The service is prompt and efficient	0.716				
Excellent service selection menu	0.742				
The service quality was excellent	0.702				
A server was there to take our order quickly	0.632				
There is a variety of food to choose from	0.611				
Considering everything, our dining experience was a good value					0.766

Table 4. Model fitting information.

Model	-2 Log likelihood	Chi-square	Significance
Intercept only	105.700	5.474	0.361
Final	100.226		

Table 5. Goodness-of-fit.

Statistic	Chi-square	df	Significance
Pearson	24.67	23	0.37
Deviance	27.95	23	0.22

Table 6. Pseudo R-square

Model	Values
Cox and snell	0.013
Nagelkerke	0.015
McFadden	0.007

include service quality by effective physical appearance; service quality in terms of ambiance and merchandise; service quality in terms of staff services, food and promotions; service quality by price, access and business hours, service quality by crew's readiness; service by quality of dining experience.

Parametric estimation using ordinal regression

The scale choice must be tested for parallel lines. The test for parallel lines showed no statistical difference (chi-square = 5.474, df = 5, p = 0.36) (Table 4).

In fitting a logit model, it is assumed that the relationships between the independent variables and the logits are the same for all logits. The aim is not to reject the null hypothesis that is the lines are parallel and assume that logits are true for all logits, otherwise the link function is incorrect for the data. Now, given that the test is not significant (p value = 0.36) there occurred relationships between the independent variables and the logits and that are the same for all logits for the whole system of equation.

Also, in fitting a model in ordinal regression, it is assumed that the observed and expected cell counts are similar, and that the value of each statistic must be small, while it is a must that the result of the test would yield a large significance value.

Therefore, if the significance level for the goodness-of-fit value is small, then the hypothesis that the model fits is rejected. As indicated in Table 5, the goodness-of-fit measures have large observed significance level (Pearson chi square = 24.67, df = 23, p = 0.37), hence the model fits.

The R^2 in an ordinal regression is not as important as those in statistic regression, since the interpretations are not directly related with the relationship of the dependent variable and the predictor variables. It is expected that the pseudo R^2s are small, as in this estimate, the pseudo R^2s are small (Cox and Snell = 0.013, Nagelkerke = 0.015, McFadden = 0.007) (Table 6).

The parametric estimation of the service quality scale using ordinal logistic regression using the maximum likelihood estimation obtaining the coefficients of the variables indicated that the statistically parallel scale choices were the customer perception that the services tendered by the fast food chain were of moderate and better service quality (Table 7).

The test also indicated no statistical significance for the chosen characteristics of the customers to influence the response measure that a customer considers a moderate quality service or better service quality as tendered by the fastfood chain. This leads suggest that the customer's personal characteristics do not signify effect on the total satisfaction on the services of the establishment.

Conclusion

Six components were found to stimulate the customers' satisfaction on the service quality of a food establishment. These are effective physical appearance; quality of merchandise; staff, food and promotions of it; price, access and business hours of the establishment; crew's promptness; dining experience. Of these components, four conforms to established service quality

Table 7. Parameter estimates.

Indicators		Estimate	Standard error	Wald	Significance
Threshold	Moderate quality of service	-1.96	0.503	15.171	0
	Better service quality	0.665	0.489	1.85	0.174
Location	Male	0.095	0.191	0.246	0.62
	Female	0[a]	.	.	.
	Student	-0.267	0.209	1.632	0.201
	Working	0[a]	.	.	.
	Ages 14-20	0.391	0.531	0.542	0.462
	Ages 21-25	0.617	0.514	1.444	0.229
	Ages 26-30	-0.012	0.604	0	0.985

measure. These four includes product knowledge of the staff, crew's promptness, product quality (quality of merchandise), and the product price. Yet, the customers also consider the physical appearance and the total dining experience in evaluating the service quality.

What is surprising is that the satisfaction of the customer on the services afforded by the fast food establishment does not vary between males or females, neither on age nor to a student or to that of a working individual.

Thus, in addition to the established components on service quality measurement (Zeithaml et al., 1990), the total dining experience and the physical appearance are two constructs that cut across impressions of a person's age, physical orientation or ability to buy of the customer.

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