Factors Affecting Food Choice: An Empirical Study

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Abstract

Food and food related purchase are routine, there is low involvements for majority of products with emotion are observed among people. There are number of factors affecting food consumption, the present study tries to investigate the factors affecting food choice. To meet objectives of study cross sectional descriptive research design was employed. The responses were obtained by using structured questionnaire. The convenience sampling technique was used in present study and 200 respondents were surveyed. The collected data were analysed with descriptive statistics, factor analysis and cluster analysis. The study found that the important factor affecting food choices were Freshness, Price, Taste, Season, availability whereas least important factors were Advertisements and Neighbour influence. The exploratory factor analysis yielded four main factors affecting food choice namely "Product Attributes and Availability, Socio-Cultural Factors, Advertisements and Price".

Keywords: *Food, Food choice, Factors affecting food choice, Factor analysis, Food Consumption, Food Preference*

Introduction

Food is an important part of life and it is basic need of life. It is the source of energy to body and backbone of our daily routine. The food items has maximum share in the expenditure of Indians – 48.6 percent for rural and 38.6 percent in urban (NSSO 68th round). Even though food is basic need, the food buying behavior is complex (Alexandra Bargiota, 2013). There are various social, cultural, geographic, personal and psychological factors affecting on food choice (Marion Nestle et.al, 1998). People of different personality have different food preferences (Jaeger et.al, 1998 : Carmen Keller, 2015) which make consumer behavior towards food complex. After liberalization, privatization and globalization the Indian economy is in transforming phase. The increased income, rising standard of living, lifestyle, convenience are the factors which affects consumer behavior towards almost all products directly or indirectly. In this environment the present study focuses on the various factors affecting food choice.

Methodology

The present study aims to investigate factors affecting food choice. To fulfill the stated objective descriptive cross sectional research design was employed. To collect data from respondents

structured questionnaire was used. The questionnaire contains questions related to demographic profile of respondents such as gender, age, education, occupation etc. and the research questions related to food choices. To find out factors affecting food choices five point rating scale were used, where respondents were asked to rate attributes on five point where 5- Very Important,4 - Important, 3-Neutral , 4- Not Important, and 1 - Not Important At All. Total 200 respondents were surveyed from rural and urban area from Gujarat by applying convenience sampling technique.

Data Analysis

The collected data were tabulated and analyzed with help of computer software. The statistical tools employed for present study are frequencies, percentage and Exploratory Factor Analysis. Exploratory factor analysis using principal component analysis approach was used to determine the most important variables from the large number of variables in the set of data that affecting food choice.

Result and Discussion

The collected data were analysed with computer software the descriptive statistics, exploratory factor analysis and cluster analysis were used to analyse the collected data. The results were summarized in below tabular forms.

Demographic profile of respondents

Total 200 respondents were surveyed and out of that 74.5 percent were male whereas 25.5 percent were female. The 29.5 percent of respondents studied up to graduate level followed by 21.5 percent studied up to HSC/Diploma level where as 12.5 percent studied up to post graduation level. The 41.5 percent of respondents were service class (either private or government) followed by 21.5 percent engage with agriculture and allied activities and 20.5 percent were students. The 65 percent of respondents were married. In case of monthly income 63.5 percent respondents have less than 25000 Rs. Monthly income followed by 26.5 percent having monthly income between Rs.25000-Rs.50000. The 79 percent of respondents belongs to rural area whereas 21 percent were belongs to urban area.

Table-1: Factor affecting food choice

Parameters	1	2	3	4	5	Mean	S.d	Rank
Price	7.5	13.5	7.5	34	37.5	3.38	1.279	2
Freshness	12.5	10	6.5	21	50	3.86	1.442	1
Availability	7	9	15	40.5	28.5	3.74	1.169	5
Advertisements	7	25	31	24.5	12.5	3.1	1.127	10
Taste	16.5	9.5	3	23	48	3.77	1.527	3
Season	7	14.5	10.5	31	37	3.77	1.28	4
Status	8.5	17.5	29	28.5	16.5	3.27	1.181	8
Neighbor Influence	8	28	28	22	14	3.06	1.181	11
Occasion	7.5	22	20.5	33	17	3.3	1.203	7
Tradition	11	25	18	23	23	3.22	1.342	9
Festivals	7.5	15	11.5	31	35	3.71	1.29	6

The respondents were asked to rate factors affecting food choice on five point rating scale where 5- Very Important,   4- Important, 3-Neutral, 4- Not Important, and 1-Not Important At All, based on the responses the mean were calculate and ranks were given accordingly. The important factor affecting food choices were Freshness, Price, Taste, Season, availability whereas least important factors were Advertisements and Neighbor influence.

Factor Analysis

Factor analysis attempts to identify underlying variables, or factors, that explain the pattern of correlations within a set of observed variables. Factor analysis is often used in data reduction to identify a small number of factors that explain most of the variance observed in a much larger number of manifest variables.

Factor analysis was carried out by using 'Principal Component Analysis method' on all the responses to 11 attributes for food. To check appropriate data for factor analysis two tests have been conducted. (I) Bartlett's test of sphericity and (II) Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy.

 The results showed the approximate Chi-Square value of 1356.173 at 55 degree of freedom under the Bartlett's Test of Sphericity, which is significant at the 0.05 levels. The null hypothesis (that the variables are uncorrelated in the population, or the correlation matrix is an identity matrix) is, therefore, rejected. The alternate hypothesis that the variables in the population are correlated is accepted. Generally, the values of 'KMO measure of sampling adequacy', falls in-between 0.5 to 1.0, which indicate factor analysis is appropriate. Values below 0.5 indicate inappropriateness of the analysis and near to 1 is more appropriate. For the present study the Kaiser-Meyer-Olkin Measure of Sampling Adequacy value obtained is 0.872.

Table -2: **KMO and Bartlett's Test**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	1356.173
	Df	55
	Sig.	.000

Further analysis, therefore was carried out. In the final results shown in below table, total four factors were extracted. The results also show that these four factors account for 80.103 percent of the total variance.

Table -3: Total Variance Explained

Com pone nt	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Varian ce	Cumula tive %	Total	% of Varian ce	Cumulati ve %	Total	% of Varianc e	Cumula tive %
1	5.280	48.000	48.000	5.280	48.000	48.000	4.137	37.611	37.611
2	1.843	16.755	64.754	1.843	16.755	64.754	2.489	22.631	60.242
3	1.054	9.577	74.332	1.054	9.577	74.332	1.179	10.720	70.962
4	.635	5.772	80.103	.635	5.772	80.103	1.006	9.142	80.103
5	.549	4.987	85.091						
6	.478	4.346	89.437						
7	.315	2.862	92.299						
8	.265	2.408	94.706						
9	.244	2.217	96.923						
10	.210	1.906	98.829						
11	.129	1.171	100.000						
Extraction Method: Principal Component Analysis.									

An important output from factor analysis is the factor matrix, also called the *factor pattern matrix*. The factor matrix contains the coefficients used to express the standardized variables in terms of the factors. A coefficient with a large absolute variable indicates that the factor and the variable are closely related. To draw interpretation of factors, it is necessary to identify the variables that have large loadings on the same factor. It was decided to consider factor loading of 0.40 as a cut off point for a statement to be associated with a factor. When 'factor matrix' of the above four factors was referred to, and a cut off value of loading of 0.4 was considered; five attributes were associated with factor '1', four attributes with factor 2 , one attributes with factor 3 and one attributes with factor 4.

Although, the initial or un-rotated factor matrix indicates the relationship between the factors and individual variables, and because the factors are correlated with many variables, the interpretation becomes difficult. Therefore, it is transformed into a simpler one through rotation. Again, many methods are available for rotation. Most commonly used method for rotation is the 'varimax' procedure. Here 'varimax' used to get the factor matrix and factor loadings.

Table- 4 Rotated component matrix

<table>
<thead>
<tr><th colspan="5">Rotated Component Matrix^a</th></tr>
<tr><th></th><th colspan="4">Component</th></tr>
<tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th></tr>
</thead>
<tbody>
<tr><td>Freshness</td><td>.929</td><td></td><td></td><td></td></tr>
<tr><td>Taste</td><td>.874</td><td></td><td></td><td></td></tr>
<tr><td>Availability</td><td>.845</td><td></td><td></td><td></td></tr>
<tr><td>Season</td><td>.818</td><td></td><td></td><td></td></tr>
<tr><td>Festivals</td><td>.745</td><td>.431</td><td></td><td></td></tr>
<tr><td>Neighbour influence</td><td></td><td>.780</td><td></td><td></td></tr>
<tr><td>Traditions</td><td>.425</td><td>.758</td><td></td><td></td></tr>
<tr><td>Status</td><td></td><td>.723</td><td></td><td></td></tr>
<tr><td>Occasion</td><td>.466</td><td>.703</td><td></td><td></td></tr>
<tr><td>Advertisements</td><td></td><td></td><td>.885</td><td></td></tr>
<tr><td>Price</td><td></td><td></td><td></td><td>.908</td></tr>
<tr><td colspan="5">Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.</td></tr>
<tr><td colspan="5">a. Rotation converged in 7 iterations.</td></tr>
</tbody>
</table>

The exploratory factor analysis extracted four factors namely *Product Attributes and Availability*, *Socio-Cultural Factors*, *Advertisements* and *Price*.

The first factor termed as Product Attributes due to the high loading to the attributes like Freshness, Taste, Availability, Season and Festivals which explain 37.611 % of total variance. The second factor termed as *Socio-Cultural Factors* due to high loading of the attributes like Neighbour influence, Traditions, Status and Occasion which explains 22.631 % of total variance. The third factor termed as *Advertisements* due to high loading to the attribute advertisement which explain 10.720 % of total variance. The fourth factor labeled as price due to high loading to the attribute advertisement which explain 9.142 % of total variance. Thus all four factors explain 80.103 % of total variance.

The findings of the study are in line with H.Kavitha, (2011) who found that "intrinsic factor (sensory appeal, price and health) are much influential than extrinsic factors such as convenience, familiarity and mood for food preference". Gupta, (2009) "five most important parameters affecting food purchase are cleanliness, free from pesticide, freshness, good for health and clean place for sale" The study also support findings of Y.Prabhavathi, (2014)

Custer analysis

Custer analysis is a class of techniques used to classify objects or cases into relatively homogeneous groups called clusters. (Malhotra,2005). Using cluster analysis a customer "type" can represent a homogeneous market segment. Identifying their particular needs in that market allows products to be designed with greater precision and direct appeal within segment.

K-means cluster analysis was performed on the factor scores generated by exploratory factor analysis on factors affecting food choice. Further characteristics of each cluster were studied in detail. ANOVA table, number of cases in each cluster and Final cluster solutions were the necessary details that were generated in the said analysis and presented below.

Table-5: Initial Cluster centers

Initial Cluster Centers			
	Cluster		
	1	2	3
REGR factor score 1	1.36626	1.17049	-1.02061
REGR factor score 2	-2.83128	.35267	.68941
REGR factor score 3	1.54705	.36360	-2.90462
REGR factor score 4	.68453	-3.09333	1.07445

Clusters that are being extracted should be different from each other and the purpose of F test is to maximize the difference among cases in different clusters. In other words, one cluster should be different in terms of responses given by respondents from other clusters. In the ANOVA table above all the p-values are significant and can be said that cluster means are not equal.

Table-6 : ANOVA table for cluster analysis

ANOVA						
	Cluster		Error			
	Mean Square	Df	Mean Square	Df	F	Sig.
REGR factor score 1	8.458	2	.924	197	9.151	.000
REGR factor score 2	16.020	2	.848	197	18.903	.000
REGR factor score 3	33.503	2	.670	197	50.003	.000
REGR factor score 4	69.928	2	.300	197	232.920	.000

Table-7: Number of cases in each cluster

Number of Cases in each Cluster			Percentage
Cluster	1	81.000	20.5%
	2	50.000	25 %
	3	69.000	34.5 %
Valid		200.000	100
Missing		0.000	

Table above indicates total number of respondents in each cluster. It can be seen from the above table that maximum 35.50 % respondents' falls to Cluster No. 3, followed by 25 % respondents belong to Cluster No. 2 and 20.5% respondents belong to Cluster No. 1.

Table-8 Final Cluster Center

Final Cluster Centers			
	Cluster		
	1	2	3
REGR factor score 1	.28005	-.45962	.00430
REGR factor score 2	-.38755	-.10289	.52950
REGR factor score 3	.63746	-.06574	-.70068
REGR factor score 4	.45344	-1.44762	.51670

Table above shows final cluster centres and the cluster summary. Numbers within the table shows factor scores between Factors affecting food choice and corresponding clusters. Number within the table indicates loading of factor on each cluster. Cluster was allocated to a particular factor in which there was highest amount of loading. Cluster 1 consist respondents focuses on advertisements and price, the cluster 2 consists respondents who were highly price sensitive and product attribute and availability. The cluster 3 consist of the respondents focuses on socio-cultural factors and price.

Conclusion

Being an important need, food plays a significant role in one's life. The present study tries to investigate the factors affecting food choice. The study found that the important factor affecting food choices were freshness, price, taste, season, availability whereas least important factors were advertisements and neighbor influence. The exploratory factor analysis was also carried out to find out underlying factors and found that factors namely Product Attributes and Availability, Socio-Cultural Factors, Advertisements and Price explain 80.103 percent of total variance. The cluster analysis yielded three clusters one cluster consist respondents focuses on advertisements and price, while another cluster consist respondents who were highly price sensitive and product attribute and availability. The other cluster consist of the respondents focuses on socio-cultural factors and price.

Future Research

The present research focuses on broad factors affecting food choice. The further research can be carried out on how factors affecting food items vary for specific food change. There is difference in the lifestyle between rural and urban area and how the various factors play role in food choice among rural and urban. The further study can be carried out on the areas like impact of urbanization, lifestyle on food choice by various specific categories of food items.

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