



**FACTORS AFFECTING THE SELECTION OF A PARTICULAR PRODUCT: A
BEHAVIORAL STUDY ON CONSUMER GOODS TOOTHPASTE**

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KUS -06/20-220606

Manuscript received: July 22, 2006; Accepted: September 10, 2006

Abstract: The study aimed at identifying the factors that consumers consider valuable at the time of purchasing a particular convenience product: toothpaste in this case. Four core factors (health, social, individual, and economical) covering twelve variables have been analyzed to reveal the consumers' attitude that guides them towards purchase decision of a particular product. So, both the producers and the marketers should focus on properly measuring the core variables under the factors and emphasizing on incorporating these variables in product design to get favorable consumers' attitude.

Key words: Consumer, behavior, attitude, satisfaction, toothpaste

Introduction

Understanding of consumers' behavior is the core of all marketing activities. Consumers in general, except some loyal one, run on impulse showing instant difference in their saying and doing. They usually respond to variables that change their minds and their purchase decisions as well at the last moment, especially for consumer goods. Consumer behavior involves the purchasing, and other consumption related activities involved in the exchange process. The better the company knows its consumers' expectation and product preference, the more likely it becomes competent in winning the potential market and retaining the existing market. Procter and Gamble, the US giant in consumer product marketing believes: 'Our business is based on understanding the consumer and providing the kind of products that the consumer wants. We place enormous emphasis on our product development area and marketing area, and our people knowing the consumer' (Crain and Danzig, 1987). The proof of determining the consumer orientation in the marketing concept of the company depends on how factors like health, social, psychological, technological, economical etc satisfies the consumers. This is possible only when factor- mix is developed by including positive answers to the questions listed in the discussion. In the absence of actual experience with a product, consumers often evaluate the product on the basis of price, brand image, manufacturer's image, retail store image, or even the country of origin. Different consumers may like or dislike the same product or service for different reasons.

A consumer's buying behavior is influenced by psychological, social, personal and cultural

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DOI: <https://doi.org/10.53808/KUS.2006.7.2.0620-M>

factors. An individual's choices are determined by some major psychological factors; such as attitudes, motivation, perception, learning, and beliefs. Two types of attitudes possibly affect purchasing decisions. Firstly, there are personal attitudes- the preference evaluation of the buyer consideration just from an individual perspective. Secondly, the individual buyer may take into account the attitudes of those important to him or her, known as situational or social attitudes (Howard and Lyman, 1973). Inner directed people seem to prefer product features and personal benefits, whereas other directed people prefer features that ensure approval of social environment or social acceptance (Schiffman and Kanuk, 2005). A buyer's decisions are also fixated by personal factors like economic circumstances, occupation, personality, health etc. A product or brand's personality can either be 'functional' or 'symbolic' (Bhat and Reddy, 1998). Its common sense to conclude and supported by research evidence that any product or brand personality, as long as it is strong and favorable, will strengthen a brand (Haigood *et al.*, 1999, 2001; Menon and Sharma, 1999; Marshall and Grove, 2001). Fitness and health are becoming lifestyle choices for many consumers (Schiffman and Kanuk, 2005). Although there is no denying the 'fitness and healthy living' trend in American society, there is evidence that consumers find it difficult 'to be good, in terms of their personal health (Schiffman and Kanuk, 2005). The Wall Street Journal has reported that 100 million Americans sought health information over the Internet in the year 2000- up 30 million from the priory year (Landro, 2000). A study that asked Chinese consumers to categorize various products in terms of gender, found that they perceived coffee and toothpaste to be masculine products, whereas bath soap and shampoo were seen as feminine products (Milner *et al.*, 1995). In addition to personal and psychological factors a consumer choices is influenced by such social factors as references groups, family, and social role and status.

The marketers should consider the factors that develop customers' preference as well as brand loyalty towards a particular brand. In this study toothpaste has been taken as representative from convenience goods category to find out factors favored by consumers in selecting a particular product. The objectives of the study are to find out the core as well as functional attributes of toothpaste that help consumer decide on the product and identify to what extent consumers emphasize on factors related to health, economical, individual, social, etc.

Materials and Methods

The study is descriptive in nature and mainly based on first hand information. One hundred respondents from 100 households have been interviewed using a Five Point Likert Scale. Khulna City has been divided into four zones, such as, Khalishpur, Daulatpur and its adjacent area (zone one), Sonadanga, New market, and its adjacent area (zone two), Tutpara, Miapara, Dakbangla, and its adjacent area (zone three) and Nirala, Moilapota, Khulna University, and its adjacent area (zone four) for the research purpose. Twenty five respondents from each zone have been selected by using cluster sampling technique.

Results

The data have been analyzed through factor analysis technique where the following 12 variables have been considered -

V1:	Shiny teeth	V2:	Strengthen gum
V3:	Freshen breath	V4:	Prevent teeth decay
V5:	Economy	V6:	Mouthwash
V7:	Germ check	V8:	Prevent teeth plaque
V9:	Mint	V10:	Fluoride
V11:	Cardamom	V12:	Gel

Factor analysis formula is - $X_i = A_{i1} F_1 + A_{i2} F_2 + \dots + A_{im} F_m + V_i U_i$

Where, X_i = i th standardized variable; A_{ij} = Standardized multiple regression coefficient of variable i on Common factor j ; F = Common factor; V_i = Standardized regression coefficient of variable i on unique factor I ; U_i = The Unique factor for variable I ; m = number of common factors.

The common factors themselves can be expressed as linear combinations of the observed variables.

$$F_i = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \dots + W_{ik}X_k$$

Where, F_i = estimate of i th factors; W_i = weight or factor score coefficient; K = number of variables (Malhotra, 2002).

The results of analysis are provided in Table 2. The approximate chi-square statistic is 473.403 with 66 degree of freedom at the 0.05 level of significance. The value of the KMO statistic (0.694) is also large, ($p > 0.5$). Table 2 shows the appropriateness of factor analysis and also suggests further investigation using principle components analysis method.

From Table 3 under 'communalities', in 'Initial' column it can be seen that the communality for each variable, V1 to V12, is 1.0 as unities were inserted in the diagonal of the correlation matrix.

The Table 4 the eigenvalue for a factor indicates the total variance attributed to that factor. The total variance accounted for by all the twelve variables is 12.00, which is equal to the number of variables. Factor 1 account for a variance of 3.172, which is (3.172/12) or 26.436% of the total variance, likewise, the second factor accounts for (1.766/12) or 14.714% of the total variance, and first two factors jointly account for 41.150% of the total variance. Only factors with eigenvalues greater than 1.0 are retained; the other factors are excluded. An eigenvalue represents the amount of variance associated with the factors. It is recommended that the factors extracted should account for at least 60% of the variance.

In Table 5, it is observed that the eigenvalue greater than 1.0 (default option) results in five factors being extracted. The cumulative percentage of variance testimony the first five factors to be accounted for 69.479% of the variance.

The second column under 'Communalities' in Table 3 shows that the variables under 'Extraction' are different from those under 'Initial' because all of the variances associated with the variables are not explained unless all the factors are retained. The 'Extraction Sum of Squared Loading' presents the variances associated with the factors that have been retained. These are the same as those under 'Initial eigenvalues'.

A coefficient with a large absolute value indicates that the factor and the variable are closely related. In Table 6, factor 1 is somewhat correlated with five out of twelve variables (absolute value of factor loading greater than 0.3). Whereas three variables correlated with factor 1 in the unrotated matrix, only V10, V11 and V12 correlated with factor 1 after rotation. Variables V2, and V4 are correlated with factor 2. For factor 3, variables V3, V6 and V7 are correlated. While V8 and V9 are correlated with factor 4; and finally V1 and V5 are with factor 5.

In the rotated factor matrix of Table 8, factor 1 has high coefficients for variables V10 (fluoride), V11 (cardamom) and V12 (gel). Therefore, these factors may be labeled as individual benefit factors. Factor 2 is highly related with variables V2 (strong gums), and V4 (prevention of teeth decay). Thus factor 2 may be labeled as health benefit factor. Factor 3 has high coefficients for variables V3 (freshens breath), V6 (mouthwash), and V7 (germ check). This factor may be labeled a social and health benefit factor. Factor 4 is connected with variables V8 (prevention of teeth plaque), V9 (mint). This factor may also be labeled as health and individual benefit factor. Factor 5 is related with variables V1 (shiny teeth) and V5 (economy). These factors may be labeled as social and economical benefit factor. It could be summarized that the consumers appear to seek some major kinds of benefits from toothpaste: health, social, economical and individual benefits.

In Table 8, variables V10, V11, and V12 have high loading on factor 1 and all are fairly close in magnitude, although V11 has relatively the highest loading and therefore be a likely preference for cardamom. Therefore, V11 would be selected as surrogate variable under factor 1 since it has the highest factor loading. But the choice of a surrogate variable for factor 2 is not straightforward because variables V2 and V4 both have comparable high loading. While prior knowledge suggests that prevention of teeth decay is the most important health benefit sought from toothpaste, the researchers have select V4. Variables V3, V6, and V7 have high loading on factor 3 and among the three variables V3 has the highest loading. So freshens breath would be selected as the surrogate variable for factor 3. In factor 4, V8 (prevention of teeth plaque), has the highest loading and in factor 5, V5 (economy), has the highest loading.

Table 1. Identified factors with variables regarding toothpaste.

Factors	Variables	Surrogate Variables
Factor 1 (Individual factors)	V10, V11, V12 (Fluoride, cardamom, gel)	V11 (Cardamom)
Factor 2 (Health factors)	V2, V4 (Strong gum, prevention of teeth decay)	V4 (Prevention of teeth decay)
Factor 3 (Social and health factors)	V3, V6, V7 (Freshen breath, mouthwash, germ check)	V3 (Freshen breath)
Factor 4 (Health and individual factors)	V8, V9 (Prevention of teeth plaque, mint)	V8 (Prevention of teeth plaque)
Factor 5 (Social and economical factors)	V1, V5 (Shiny teeth, economy)	V5 (Economy)

A basic assumption underlying factor analysis is that the observed correlation among different set of variables can be attributed to common factors. The difference between the observed correlations and the reproduced correlations can be examined to determine model fit. These differences called residuals. If there are many large residuals, the factor model does not provide a good fit to data and the model should be reconsidered. In Table 9, only 34 non-redundant residuals are with absolute values > 0.05 , indicating an acceptable model fit.

Discussion

The study suggests that Factor 1 is the individual benefit factor composed of three variables: Fluoride, Cardamom, and Gel. Among these three variables ‘cardamom’ has taken the top priority in the consumers’ mind. So, marketers should consider ‘cardamom’ as individual benefit factor. While, Factor 2 is the health benefit factor consisting of two variables: strong gum and prevention of teeth decay. Between these two variables ‘prevention of teeth decay’ gets the main concern. Similarly, Factor 3 is the social and health benefit factor, which includes: freshen breath, mouthwash, and germ check where ‘freshen breath’ is the dominant social variable to the consumers. Concomitantly, Factor 4 is the health and individual benefit factor made-up of two variables: prevention of teeth plaque and mint. Between these two variables ‘prevention of teeth plaque’ is more important to consumers. Factor 5 is social and economical benefit factor, which formulates with two variables: shiny teeth, and economy. Between these two ‘economy’ is the most essential variable.

Conclusion

Consumer behavior (attitude) is quite difficult to measure because countless factors such as social, cultural, individual, economical as well as psychological are involved in purchasing/selecting a product. Thus, it seems to be complicated for the marketers as well as producers to determine some specific variables under the social, cultural, individual, economical, and health factors in introducing a product. It would be difficult to gain a positive response from the consumers if the marketers or the producers include so many variables at the time of developing a product. When the marketers want to make a favorable business deal, they have to select some specific attributes and benefits sequentially in their offerings which the mass consumers consider valuable.

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Appendices: Results of Principal Components Analysis (PCA)

Table 2. KMO and Bartlett's test.

Kaiser-Meyer-Olkin measure of sampling adequacy	0.694	
Bartlett's test of sphericity	Chi-square	473.403
	df	66
	Significance	.000

Table 3. Communalities.

Variable	Initial	Extraction
V1	1.000	0.695
V2	1.000	0.678
V3	1.000	0.668
V4	1.000	0.741
V5	1.000	0.667
V6	1.000	0.331
V7	1.000	0.486
V8	1.000	0.781
V9	1.000	0.541
V10	1.000	0.920
V11	1.000	0.931
V12	1.000	0.900

Extraction method: PCA.

Table 4. Total variance explained (Extraction method: PCA.).

Factor	Initial eigenvalues		
	Given values	% Variance	Cumulative %
1	3.172	26.436	26.436
2	1.766	14.714	41.150
3	1.328	11.070	52.220
4	1.063	8.861	61.082
5	1.008	8.397	69.479
6	0.972	8.100	77.579
7	0.760	6.335	83.914
8	0.692	5.771	89.685
9	0.632	5.265	94.950
10	0.442	3.685	98.635
11	0.113	0.940	99.575
12	5.098E-02	0.425	100.000

Table 5. Total variance explained.

Factor	Extraction sums of squared loadings		
	Eigenvalues	% of Variance	Cumulative %
1	3.172	26.436	26.436
2	1.766	14.714	41.150
3	1.328	11.070	52.220
4	1.063	8.861	61.082
5	1.008	8.397	69.479

Table 6. Factor matrix.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V1	0.123	0.315	-0.612	-0.318	-0.323
V2	0.260	0.649	-0.235	-0.199	0.306
V3	0.124	-9.392E-03	0.652	-0.359	-0.313
V4	4.222E-02	0.782	-1.901E-03	0.184	0.307
V5	0.309	-0.390	-9.396E-04	0.321	0.563
V6	-0.172	0.314	0.345	-0.187	0.221
V7	0.233	0.268	0.567	-0.123	0.152
V8	0.183	0.528	0.163	0.510	-0.427
V9	0.458	3.520E-02	6.210E-02	0.529	-0.214
V10	0.949	-0.135	-2.859E-02	1.596E-03	-6.727E-03
V11	-0.952	0.116	3.357E-03	9.983E-02	1.011E-02
V12	-0.917	1.474E-03	4.853E-02	0.237	-7.502E-03

Extraction method: PCA. A 5 components extracted.

Table 7. Total variance explained.

Factor	Rotation sums of squared loadings		
	Given values	% of Variance	Cumulative %
1	3.043	25.359	25.359
2	1.552	12.937	38.296
3	1.317	10.973	49.269
4	1.245	10.371	59.640
5	1.181	9.839	69.479

Table 8. Rotated factor matrix.

Var.	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V1	0.197	0.209	-0.345	-6.442E-02	0.700
V2	0.222	0.766	-5.598E-03	-6.587E-02	0.193
V3	0.125	-0.269	0.742	2.377E-02	0.169
V4	-0.106	0.809	8.181E-02	0.262	-1.184E-02
V5	0.293	4.811E-03	-0.217	-8.929E-02	-0.725
V6	-0.208	0.302	0.425	-0.118	-4.021E-02
V7	0.154	0.229	0.617	7.945E-02	-0.149
V8	-1.720E-02	0.191	0.107	0.839	0.170
V9	0.326	-5.682E-02	-9.370E-02	0.630	-0.163
V10	0.937	-1.541E-02	-5.284E-03	0.168	-0.113
V11	-0.955	4.731E-03	-5.882E-02	-0.104	6.102E-02
V12	-0.937	-0.105	-8.969E-02	-1.416E-02	-5.761E-02

Extraction method: PCA. Rotation method: Varimax with Kaiser normalization. A rotation converged in 10 iterations.

Table 9. Factor score coefficient matrix.

Var.	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
V1	0.116	0.063	-0.249	-0.088	0.593
V2	0.082	0.505	-0.026	-0.179	0.076
V3	0.054	-0.245	0.585	-0.009	0.218
V4	-0.083	0.526	0.013	0.135	-0.131
V5	0.068	0.121	-0.185	-0.093	-0.632
V6	-0.069	0.215	0.321	-0.144	-0.077
V7	0.029	0.141	0.455	-0.015	-0.137
V8	-0.095	-0.001	0.026	0.702	0.120
V9	0.033	-0.097	-0.116	0.526	-0.124
V10	0.301	-0.033	-0.020	0.042	-0.042
V11	-0.318	0.028	-0.034	0.021	-0.006
V12	-0.327	-0.041	-0.063	0.114	-0.096

Extraction method: PCA. Rotation method: Varimax with Kaiser Normalization.