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AN INTEGRATED MODEL FOR PREDICTING BUYING BEHAVIOR OF YOUNG SMARTPHONES CONSUMERS

Archana Singh*, Ritu Srivastava*

Abstract: *The study has been conducted to explore, identify and develop a model for predicting buying behaviour of young Smartphones consumers. The earlier researches explicate the involvement of individual factors and environmental factors in the purchase decision of mobile handset. Smartphone consumers particularly youngsters are very selective in the purchase of the smartphones and their purchase is driven by factors like functionality, product positioning and psychological facets. The Smartphones industry has witnessed a fast technological development through its inception; it was always a challenge for the manufacturers to predict the future demand. The current research is conducted in two phases, in the first stage Exploratory factor analysis using Principal axis factoring and in second phase Confirmatory factor analysis using Structural equation modelling. The results of the study indicate that the most important parameters for predicting buying behaviour are Brand Name, Advanced Value Features and Physical Appearance.*

Keywords: *Buying Behaviour, Smartphones, Youth, Functionality, Psychological Facets, Product Positioning*

INTRODUCTION

[*]India's share in the number of mobile users globally is rising, with the country accounting for 11.61 per cent of the world's 6.8 billion users in the first quarter of 2014. According to Hong Kong based market research firm Counterpoint, the Indian mobile phone market is estimated to surpass that of Japan's by 2014 end, reaching the US$ 10 billion mark.[**] The Smartphone market has grown at a remarkable rate of 89 per cent year-on-year in 2013 in comparison to 2012. [***]Consumers are increasingly owning multiple devices, using the older devices for data back up or using separate devices for work and personal use. Consumer buying behavior in this rapidly growing market is governed by both hedonic and utilitarian aspects of product performance (Babin, Darden, & Griffin, 1994). Information processing before the purchase decision to evaluate the specific product attributes is also accompanied by the hedonic consumption aroused by multisensory images, fantasies, and emotions in consumers (Zsuzsa Deli-Gray et al., 2011). The study focuses on the determinants of choice in urban youth in the National Capital Region (NCR) for a high involvement product, that is, mobile handset.

* Global smartphone users to touch 1.75 bn in 2014: eMarketer, Business Standard, June 2014.

** Indian mobile phone market may pip Japan's by 2014 end: Report, Economic Times Daily, 25th November 25, 2014.

*** Unstoppable! Smartphone Surge in India Continues, Neilson India, January 2014.

Background: Determinants of Consumer Buying Behavior of Smartphone

According to Fishbe in Behavioral Intention Model, two dominant factors influence the consumers' purchasing intent towards a certain product firstly being the consumers' attitude based on the comprehensive cognition with the second factor being the habit of the reference group of the consumer (Fishbein et al., 1975). Smartphones were chosen for the context of the study owing to their high involvement nature and their very high rate of ownership telecommunication market, and their very high rate of ownership (Goode et al., 2005).

* Assistant Professor, Birla Institute of Management Technology (BIMTECH), Greater Noida, Uttar Pradesh, India. Email: archana.singh@bimtech.ac.in

** Assistant Professor, Birla Institute of Management Technology (BIMTECH), Greater Noida, Uttar Pradesh, India. Email: ritu.srivastava@bimtech.ac.in

It is generally held belief that the perceived value is obtained through variety of product attributes which is demonstrated by its perceivable results (Gengler et al., 1999). The means-end chains theory supposes that consumers could have the logical knowledge structure in their memories because of the cognition to the product (Claeys et al., 1995). The evaluative parameters can include objective attributes, such as price and brand name, or subjective attributes, such as quality, comfort, and design (Grapentine, 1995; Myers & Shocker, 1981). Ling, Hwang, and Salvendy (2006) surveyed college students to identify their preference of their current mobile phone and found that the physical appearance, size, and menu organization of the mobile phones are the most determinant factors affecting the choice of mobile phones. According to Karjaluoto et al. (2005), the most influential product attributes affecting the choice amongst mobile phone brands are price, brand, interface and properties. Mack and Sharples (2009) showed that usability is the most important determinant of mobile choice; other attributes, particularly features, aesthetics, and cost also have an implication on the choice of mobile phone brand. Saif et al. (2012) selected four important factors, that is, price, size/shape, new technology features, and brand name and analyzed their impact on consumers' buying behavior. According to their result, consumer's value new technology features as the most important variable. Das (2012) conducted an empirical research based on survey method on factors influencing buying behavior of youth consumers towards mobile handsets in coastal districts of Odisha located in India and found that their choice is determined by the brand of the handset, smart appearance, advanced value added features, pleasurability, and usability. Pakol et al. (2010) attempted to investigate consumer purchasing motives in the cellular phone markets and the results indicated that price and properties were the most influential factors affecting the purchase. Malasi (2012) examined the influence of product attributes on mobile phone preferences among undergraduate university students in Kenya. Various aspects of product and brand attributes were considered, such as color themes, and visible name labels. The study done by Mesay Sata (2013) used multiple regression analysis to test the effects of six independent variables (price, social influence, durability, brand name, product feature, and after sales service) on the decision to buy a mobile phone device and found all of them significant. The leading factor in the results was price, followed by product features and durability. The study conducted by Sanshan and Yongjian (2010) observed that the psychological factors influencing college students' purchase of mobile phone in west China include social attribute, reliability, coherence, and novelty. The study by Goode et al. (2005) shows that the positive experience of product quality is the most important contributor to the feelings of satisfaction with one's mobile phone, and negative experience of product quality is the most important contributor to dissatisfaction.

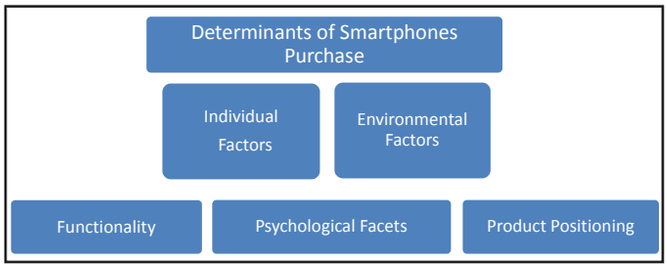

Fig. 1: Conceptual Theoretical Framework

Consumer buying behavior is influenced by two major factors. These factors are individual and environmental (Blackwell, Miniard, & Engel, 2006). The major categories of individual factors affecting consumer behavior are demographics, consumer knowledge, perception, learning, motivation, personality, beliefs, attitudes, and life styles. Environmental factors such as culture, household and social class represent the items outside of the individual that affect the individual consumer's decision making process. The theoretical framework of the study proposes three factors which influence the consumer's purchase decision of the Smartphones. Product features mapped with customer needs provide an optimal configuration of the offering (Wang, 2013) which is expressed as "functionality" in the model. The second factor is termed as "product positioning" which is based on the underlying relationship between product features, varied customer base and the numerous options available in the market (Cha, Kim, & Lee, 2009). The third factor influencing the purchase decision has been termed as "psychological facets" as consumers have social identities and they are affected by the external social environment.

RESEARCH OBJECTIVE AND PROPOSED HYPOTHESIS

The research has been conducted in two stages: Exploratory and Confirmatory.

Objective of the exploratory stage is to identify determinants of the purchase decision of the Smartphones by young consumers and to explore the construct (latent variables) as perceived by them.

Determinants as acknowledged in the exploratory research are used to investigate the functionality, product positioning and psychological facets through confirmatory research.

HYPOTESIS: There is no significant difference between the hypothesized population covariance matrix and the observed covariance matrix in the proposed model for predicting buying behavior of young smartphones consumers.

RESEARCH METHODOLOGY AND DESIGN

The objective of this research is to recognize various factors which influence customers at the time of purchase of a Smartphone. Market studies on Smartphones revealed various driving factors responsible for increase or decrease of sales growth of different brands of Smartphones. The significance of these factors is different for each individual and is based on physical, psychographic, as well as demographic factors of the customers. Subramanyam and Venkateswarlu (2012), as well as product attribute and brand image of the commodity (Malasi, 2012).

In the selection of an apt research technique, the potential to quantify the information to be examined has a vital role to play (cf. Merriam, 1994). First an intensive exploratory research was conducted through review of literature, which provides a theoretical basis to understand the factors which impact the buying behavior of youth for the purchase of Smartphones. The exploratory study helped us in confining only the important facets related to the research problem. Based on past researches and review of literature, we developed a research agenda to structure the conceptual framework of the study. The customers were enquired about the determinants of their Smartphones purchase decision, which includes Advanced value features, Accessories, Aesthetics, After sales services, Brand name, Celebrity endorsement, Core technical features, Cost, Durability, Interface, Experience of product quality, Packaging, Menu organization, New technology, Peer reference group, Physical appearance, Price discounts, and Simplicity/Ease in use. With these items we would try to fit a model which can best analyze the perception of youth for Smartphones.

To acquire information from our target population, the research instrument which we use is a structured questionnaire with 18 questions comprising of all the important aspects (factors) accountable for consumer behavior in the selection of a Smartphone.

The questions have been framed on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree", the respondent has to specify a degree of agreement or disagreement for each determinant delineated.

The sample frame for the research was the academic institutions of (National Capital Region) India. Study has been carried out by interviewing 240 youths pursuing graduation or post- graduation, and the sampling was done through simple random sampling. On the collected data, exploratory factor analysis (EFA) has been conducted to categorize these items in relevant components based on consumer perception about Smartphones. Principal Axis Factoring method is utilized to uncover the underlying structure, extract the factors and build a parsimonious model to examine dimensionality or consistency in the components. To refine the factor extracted, factors with lower values in anti-image matrix and communalities were dropped until the KMO value was found suitable for further analysis. The degree of homogeneity or internal consistency is tested through Cronbach's Alpha. EFA is used to examine construct validity and construct equivalence. Two seminal texts in assessment research methods, 'Methods and data analysis for cross-cultural research' (Van de Vijver & Leung, 1997) and 'Psychometric theory' (Nunnally & Bernstein, 1994), also advocate the use of EFA. Varimax rotation is the method of choice among researchers and test developers within the field of personality assessment (Laher, 2010). Varimax rotation is an orthogonal rotation technique aimed at maximizing the sum of variances of squared loadings in the columns of the factor matrix. The data analysis was done on the Statistical Software Packages for Social Sciences (SPSS) Version 24.0 and AMOS.

DATA ANALYSIS AND FINDINGS

The primary data is collected from 240 students pursuing graduation or post-graduation. The age group of the respondents is found to be range from 17 to 25 years. Amongst the respondents 134 (55.83 %) are males and the rest 106 (44.17%) are females.

Analysis of primary data is conducted after conducting reliability analysis of 18 questions in the survey. Reliability analysis permits to study the properties of measurement scales and the items that compose the scales. With internal consistency we can check the degree of homogeneity among the instrument items and if they load on the same underlying construct. The replies to a reliable survey will differ not because of multiple interpretations or the questions were ambiguous, but the replies will vary because there was a difference in opinion of the respondents.

Mathematically, reliability is defined as the proportion of the variability in the responses of the survey that is the result of the differences in the respondents.

Internal consistency of data has been checked through Cronbach alpha (α).

$$\alpha = \frac{k.c}{v+(k-1)c}$$

where, k is the number of items or test;

v is the average variance of each item (component); and

c is the covariance between the components across the current samples of respondents.

To refine the factor extracted, factors with lower values in anti-image matrix and communalities were dropped until the

KMO value was found suitable for further analysis.

Following standards are used to substantiate the latent (underlying) factors,

1. Eigen value greater than 1;
2. the steep slope in scree plot;
3. on each factor at least three items should load; and
4. to classify each factor.

Table 1: Reliability statistics

Cronbach's Alpha	No. of Items
0.709	18

Table 2: Reliability statistics

Cronbach's Alpha	No. of Items
0.802	13

This section presents the findings of this study.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	**0.83**
Bartlett's Test of Sphericity	
Approx. Chi-Square	5934.113
df	78
Sig.	0.000

Table 1 represents reliability statistics, the internal consistency of the whole questionnaire is 0.709, higher than 0.7. The 18 items measuring perception of youth customers for smartphones are analyzed using the Principal Axis Factoring method. The initial factor solution did not reveal a simple structure of underlying customer perceptions. Therefore, items with low loading and cross loading (viz., Accessories, After sales services, Experience of product quality, Packaging, and Simplicity/Ease in use) were deleted from the scale. The factor analysis was performed on the remaining 12 items. Table 2 represents the Cronbach alpha for the 13 items, and the alpha value was found to be better than the one calculated for 18 items. Table 3 represents KMO and Bartlett's test of sphericity. The KMO test and Bartlett test show that the KMO index is 0.830>0.5; therefore the samples are fit for factor analysis.

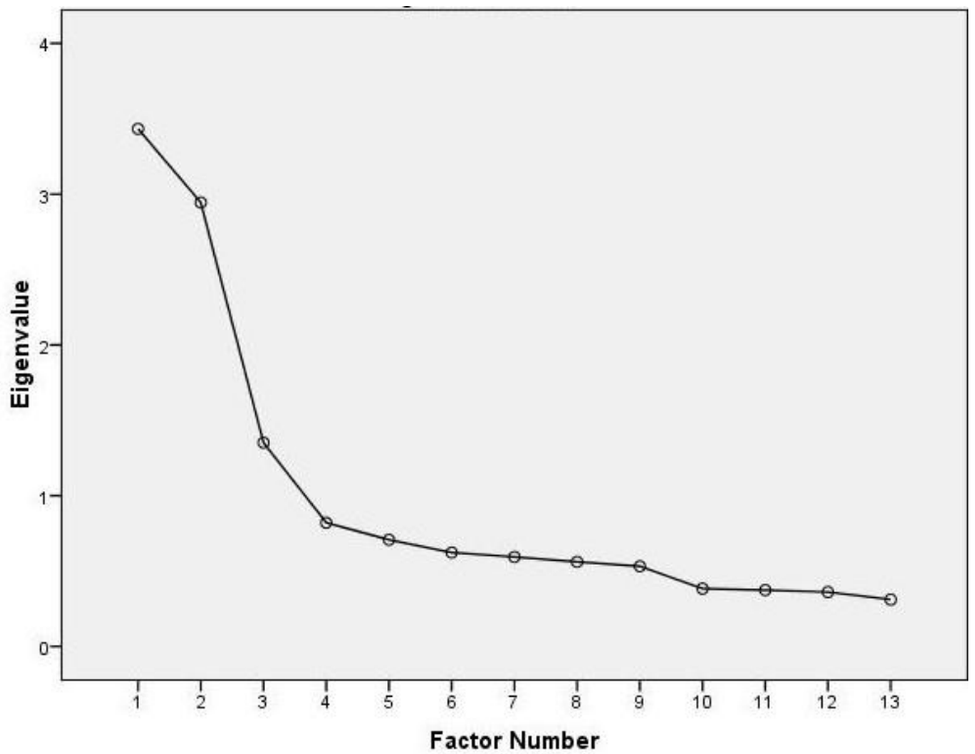

Fig. 2: Scree Plot

Table 4: Rotated Factor Matrix[a]

		Factor		
Component		**1**	**2**	**3**
1	Cost	0.790		
2	Core technical features	0.786		
3	Interface	0.778		
4	Menu organization	0.769		
5	Durability	0.650		
6	Advanced value features		0.773	
7	Physical appearance		0.772	
8	Aesthetics		0.597	
9	Peer reference group		0.472	
10	Brand name			0.692
11	New Technology			0.564
12	Price discounts			0.523
13	Celebrity endorsement			0.482
	Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.			
	a. Rotation converged in 5 iterations.			

In addition, the Bartlett test of sphericity statistic is 5934.113, and the significance level is 0.0000, which indicates that the correlative matrix of the mother-group has a common factor, so it is fit for the factor analysis. Fig. 2, presenting the Scree plot, also supports the number of factors extracted, as there is a steep breakdown from the third factor onwards. Table 4 represents the rotated factor matrix. From this table we can study the items which are clubbing together on one factor. The items which have a high loading on Factor 1 are Cost, Core technical features, Interface, Menu organization, and Durability. Thus, Factor 1 can be referred as the Functionality associated with the Smartphones. On Factor 2, items which have high loading are advanced value features, Physical appearance, Aesthetics, and Peer reference group. Factor 2 is associated with the Psychological facets a customer expects in a Smartphones. On Factor 3, Brand name, New technology, Price discounts, and Celebrity endorsement are highly loading and these all items are associated with the Product positioning of the company.

Table 5: Factor Score Coefficient Matrix

	Factor		
	1	**2**	**3**
Interface	0.247	0.029	–0.003
Core technical features	0.245	0.002	–0.009
Cost	0.256	–0.008	0.015
Durability	0.141	–0.011	0.000
Menu organization	0.255	0.011	0.009
Price discounts	0.002	–0.026	0.228
Aesthetics	–0.010	0.188	0.011
Advanced value features	0.028	0.414	–0.028
Celebrity endorsement	0.004	–0.032	0.196
Physical appearance	0.018	0.405	–0.099
Brand name	–0.003	–0.088	0.441
Peer reference group	–0.002	0.114	0.031
New Technology	–0.005	–0.010	0.268
Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.			

From Table 5, that indicates the Factor Score Coefficient Matrix, we can formulate the models for the three extracted factors. The confirmation factors are:

- Functionality = 0.247; Interface; +0.245 Core technical features; +0.256 Cost; +0.141 Durability; +0.255 Menu organization.
- Psychological Facets = 0.188 Aesthetics; +0.414 Advanced value features; +0 .405 Physical appearance; +0.114 Peer reference group.
- Product Positioning = 0.228 Price discounts; +0.196 Celebrity endorsement; +0.441 Brand name; + 0.268 New Technology.

Table 6: CFA Model Fit Parameters

Evaluation Criteria	Good Fit	Proposed Model	Goodness of Fit
$\chi 2$		108.134	
Df		51	
$\chi 2$ / Df	$0 \leq \chi 2 \leq 2$	2.300	Acceptable
RMSEA	$0 \leq$ RMSEA ≤ 0.06	0.075	Acceptable
SRMR	$0 \leq$ SRMR ≤ 0.08	0.021	Accept
NFI	$0.95 \leq$ NFI ≤ 1.00	0.803	Acceptable
NNFI(TLI)	$0.95 \leq$ NNFI ≤ 1.00	0.925	Acceptable
CFI	$0.90 \leq$ CFI ≤ 1.00	0.942	Accept
GFI	$0.90 \leq$ GFI ≤ 1.00	0.923	Accept
AGFI	$0.90 \leq$ AGFI ≤ 1.00	0.932	Accept

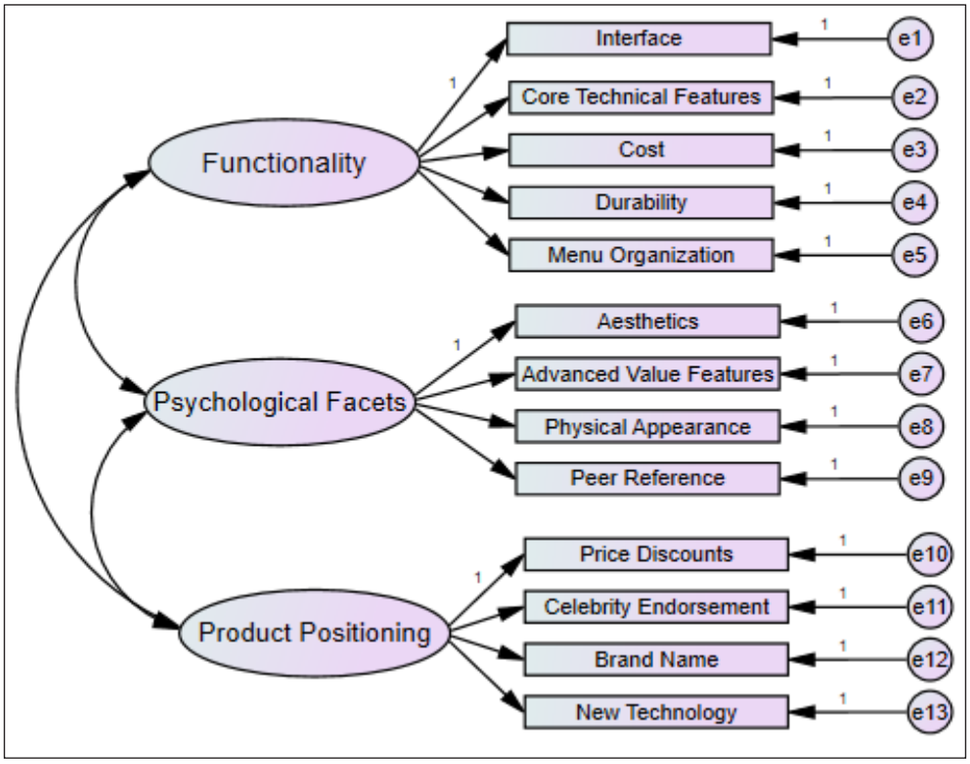

Fig. 3: CFA Model with Three Construct and Thirteen Manifest Variable

For hypothesis testing, confirmatory factor analysis was performed on the extracted model, to test the reliability of the conceptualized model. Table 6 represent CFA model fit parameters with the acceptable value of indices for the proposed model; the index value of Chi Square/Df, Root Mean Square Error of Approximation, Standardized Root Mean Square Residual, Normed Fit Index and Non Normed Fit Index is found to be acceptable as the indices calculated are very close to the range defined for good fit of the model. Standardized Root Mean Square Residual, Comparative Fit Index, Goodness of Fit Index and Adjusted GFI indicate good fit of the hypothesized model. Fig. 3 exhibits the theoretical

model, with three construct and thirteen manifest variables, hence establishing the integrated model for predicting buying behavior of young smartphones consumers.

DISCUSSION

In today's competitive environment, it is essential to recognize how potential customers will respond to a utilitarian or hedonic aspect of a product. High involvement products such as smartphones especially for the youth segment pose a major challenge for the firms in devising product related strategies for influencing purchase decision. The extant research has established that the purchase decision of the customers of smartphones is based on cognitive, physical and functionality facets along with price and technology advancement. Such research studies help companies to understand the loopholes in the product experience and to identify the opportunities that are not currently met.

The conceptual framework of the study is established by the empirical research presented in the paper. Both individual and environmental factors contributes towards the youth's decision making for purchase of smartphone. Individual factors influencing purchase are measured in terms of functionality and psychological facets of the product and the product positioning is associated with the environmental facet. The functionality facet is a composite sum of interface, core technical features, cost, durability and menu organization, psychological facets is made up of aesthetics, advanced value features, physical appearance and peer reference group while product positioning is influenced by price discounts, celebrity endorsement, brand name and new technology.

CONCLUSION

Smartphones are just not mobile handset but these are personal computers with operating system and broadband cellular networks. The gadget has witnessed a very fast pace technological advancement since its inception. On the other hand the consumer of Smartphones assess the product not only on its utility or functionality but also on psychological facets and product positioning. Babin et al. (1994) have found that both hedonism and utilitarianism are significant determinants of the buying process. Baganzi et al. (2017) have also found in their study on the smartphone choice amongst students that brand is the most important attribute influencing consumer preference. The integrated model proposed in the study for predicting buying behaviour of young smartphone consumers establishes advanced value features, physical appearance and brand name as the most important predictors. Durability along with aesthetics, reference by peer groups and endorsements by celebrities has less impact on the decision making. This study provides constructive inferences for smartphone companies targeting the youth segment.

REFERENCES

Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or fun: Measuring hedonic and utilitarian shopping values. *Journal of Consumer Research*, *20*, 644–656.

Baganzi, R., Shin, G. C., & Wu, S. (2017). Using choice-based conjoint analysis to determine smartphone choice-a student's perspective. *Journal of Information Technology Applications & Management*, *24*(4), 93–115.

Blackwell, R. D., Miniard, P. W., & Engel, J. F. (2006). *Consumer behavior* (10th ed.). Boston: Thomson South-Western.

Cha, J. E., Kim, S., & Lee, Y. (2009). Application of multidimensional scaling for marketing mix modification: A case study on mobile phone category. *Expert Systems with Applications*, *36*, 4884–4890.

Claeys, C., Swinnen, A., & Vanden, A. P. (1995). Consumers' means-end chains for "think" and "feel" products. *International Journal of Research in Marketing*, *12*(3), 13–208.

Das, D. (2012). An empirical study of factors influencing buying behaviour of youth consumers towards mobile handsets: A case study in coastal districts of Odisha. *Asian Journal of Research in Business Economics and Management*, *2*(4), 68–82.

Fishbein, M., & Ajzen, I. (1975). *Beliefs, attitude, intention, and behavior: An introduction to theory and research* (pp. 288–381). Reading, MA: Addison-Wesley.

Gengler, C. E., Mulvey, M. S., & Oglethorge, J. E. (1999). A means-end analysis of mother's infant feeding choices. *Journal of Public Policy & Marketing*, *18*(2), 172–188.

Goode, M. M., Davies, F., Moutinho, L., & Jamal, A. (2005). Determining customer satisfaction from mobile phones: A neural network approach. *Journal of Marketing Management*, *21*(7–8), 755–778.

Grapentine, T. (1995, Summer). Dimensions of an attribute. *Marketing Research*, *7*(3), 18–27.

Karjaluoto, H., Karvonen, J., Kesti, M., Koivumäki, T., Manninen, M., ... Salo, J. (2005). Factors affecting consumer choice of mobile phones: Two studies from Finland. *Journal of Euromarketing*, *14*(3), 59–82.

Ling, H. W., & Salvendy, G. (2006). Diversified users' satisfaction with advanced mobile phone features. *Universal Access in the Information Society*, *5*(2), 239–249.

Mack, & Sharples, S. (2009). The importance of usability in product choice: A mobile phone case study. *Ergonomics*, *52*(12), 1514–1528.

Malasi, J. M. (2012). Influence of product attributes on mobile phone preference among university students: A case of undergraduate students. *International Journal of Academic Research in Economics and Management Sciences*, *1*(6), 10–16.

Mesay, S. (2013). Factors affecting consumer buying behavior of mobile phone devices. *Mediterranean Journal of Social Sciences*, *4*(12).

Myers, J. H., & Shocker, A. D. (1981). The nature of product related attributes. *Research in Marketing*, *5*, 211–236.

Pakola, J., Pietila, M., Svento, R., & Karjaluoto, H. (2010). *An investigation of consumer behavior in mobile phone markets in Finland*. In Submission to the 32nd EMAC Conference, Track: New Technologies and E-Marketing.

Saif, N., Razzaq, N., Amad, M., & Gul, S. (2012). Factors affecting consumers' choice of mobile phone selection in Pakistan. *European Journal of Business and Management*, *4*(12), 16–26.

Sanshan, L., & Yongjian, L. (2010). An exploration of the psychological factors influencing college students' consumption of mobile phone in West China. *International Journal of Business and Management*, *5*(9).

Subramanyam, D., & Venkateswarlu, M. (2012). Factors influencing buyer behaviour of mobile phone buyers in Kadapa district. *Indian Journal of Research*, *11*(1).

Wang, C. H. (2013). Incorporating customer satisfaction into the decision making process of product configuration: A fuzzy kano perspective. *International Journal of Production Research*, *51*(22), 6651–6662.

Zsuzsa Deli-Gray et al. (2011). Hedonic and functional shopping values and everyday product purchases: Findings from the Indian study. *International Journal of Business and Information Technology*, *4*(1).