

Mobile Text Messaging Behavior among Youth in India: An Empirical study based on Theory of Reasoned Action

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ABSTRACT

This empirical study has investigated the Mobile Text Messaging Behavior among youth in India and the effect of text messaging Attitude, Subjective norms, Intention on Text Messaging Behavior based on Theory of Reasoned Action(TRA). The study was conducted on 329 young Mobile phone users for a period of 3 months. Structure Equation Model (SEM) is used as the main statistical procedure for data analysis. The results of the study confirmed that the TRA Model is viable in predicting the text messaging Behavior. The finding have revealed that attitude towards mobile text messaging is having significant positive effect on text messaging Intention and text messaging Behavior were as Subjective norms towards mobile text messaging has negative effect on text messaging Intention and no effect on text messaging Behavior which reveals that many people have no positive opinion to use text messaging in the society. This study has important implication for researchers to further explore text messaging Behavior based on TRA.

Keywords: Mobile Text Messaging, Attitude, Subject Norms, Intention, Behavior, Theory of Reasoned Action, Structure Equation Model

1. INTRODUCTION

Text Messaging refers to the exchange of brief written alpha-numeric message between fixed-line phones or mobile phones over a network. Mobile Text Messaging is exclusively sending text message between mobile phones. Mobile Text Messaging is also referred as SMS in India, Australia, Philippines, United Kingdom and most parts of Europe. Text Message was first used by Neil Papworth to send a Text Message "Merry Christmas" via the Vodafone network to Richard Jarvis phone in December 1992.

Today mobile text messaging is the most widely used mobile data service, with 74% of all mobile phone users worldwide are active users

of mobile text messaging. According to a research 2.3 trillion text messages are send in 2010. On average 27 text messages are send per day in Philippines which is the largest average Mobile text messaging in the world. According to Telecom Regulatory Authority of India (TRAI) an average Indian sends 29 Text Messages per month but receives 4 to 6 Text messages which are both personal and promotional oriented messages.

Text messaging is a substitute for voice calls in situations where voice communications is undesirable. Text message has many adverts over voice calls as in Text messaging the Textee (receiver of the message) is not restricted to sent a reply immediately to the Texter (sender of the message) but can send a message later at his/her

convenient time and place. Text messaging does not require real time attention and Conversations/ Messages can be stored and looked up later. Text messaging is significantly cheaper than voice call; various mobile service providers in India are offering 1000 to 2000 Short Message Services (SMS) for a minimum cost of 10 to 30 on different occasions.

Short messages are particularly very popular among youth urbanities In India. Indians use SMS for many purposes like receiving News alerts, Sports updates, Astrology, Jokes, Stock/Finance/ Business, Health tips, Jobs, Spiritual, Love tips/ Quotes and Vastu. Popular Text services used by young in India are Jokes (53%), Astrology (47%), News alerts (44%) and Jobs (43%). Males are generally more active users of SMS than Females; Males are more interested in getting sports updates were as Females are more interested in spiritual and astrology quotes.

Dr Scott Frank (2010) in his study found that teens of age between 13 to 18 years who are constantly text messaging more than 120 messages per day (called as hyper texters) are more likely to engage in risky Behavior. According to his findings presented to American public Health Association in Denver USA, Hyper texters are 40 per cent more likely to have smoked cigarettes, 43 per cent more likely to be binge drinkers; 41 per cent more likely to have used illegal drugs; 55 per cent more likely to have been in a physical fight and 90 per cent more likely to have had four or more sexual partners.

2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Davis (1989) used Technology Acceptance Model (TAM) to measure perceived usefulness, perceived ease to use and user acceptance of Information Technology. Yan et al. (2006) used TAM to measure user acceptance of SMS in

Hong Kong and China. They have found seven determinants of user intention to use SMS. Perceived usefulness, perceived ease to use, perceived enjoyment and perceived critical mass as the main direct determinant of user acceptance of SMS and visibility, subjective norm and perceived cost of effectiveness as indirect determinant on user acceptance of SMS. Baren et al. (2006) in their research "Beyond Technology acceptance: Understanding Consumer Practices" has pointed out that the term TAM need to be review as there is an inadequacy in concentration on simple acceptance of technology where technology is mixed with consumer community of practices.

The Theory of Reasoned Action (TRA) model is proposed by Fishbein and Ajzen (1975) attitude paradigm from psychology which provides a framework to study attitudes toward behaviors. According to the theory, the most important determinant of a person's behavior is behavior intent. The individual's intention to perform a behavior is a combination of attitude toward performing the behavior and subjective norm. The individual's attitude toward the behavior includes; Behavioral belief, evaluations of behavioral outcome, subjective norm, normative beliefs, and the motivation to comply.

If a person perceives that the outcome from performing a behavior is positive, she/he will have a positive attitude forward performing that behavior. The opposite can also be stated if the behavior is thought to be negative. If relevant others see performing the behavior as positive and the individual is motivated to meet the exceptions of relevant others, then a positive subjective norm is expected. If relevant others see the behavior as negative and the individual wants to meet the expectations of these "others", then the experience is likely to be a negative subjective norm for the individual. Attitudes and

subjective norm are measured on scales (as an example the Likert Scale) using phrases or terms such as like/unlike, good/bad, and agree/disagree. The intent to perform a behavior depends upon the product of the measures of attitude and subjective norm. A positive product indicates behavioral intent Glanz et al (1997).

TRA works most successfully when applied to behaviors that are under a person's volitional control. If behaviors are not fully under volitional control, even though a person may be highly motivated by her own attitudes and subjective norm, she may not actually perform the behavior due to intervening environmental conditions.

The following hypothesis are formulated to study the Text Messaging Behavior among youth based on TRA Model

Hypothesis1 (H1): Attitude towards text messaging will have a significant positive effect on text messaging Intention.

Hypothesis (H2): Subjective norms towards text messaging will have a significant positive effect on text messaging intention.

Hypothesis (H3): Attitude towards text messaging will have a significant positive effect on text messaging Behavior.

Hypothesis (H4): Subjective norms towards text messaging will have a significant positive effect on text messaging Behavior.

Hypothesis (H5): Text Messaging Intention will have a significant positive effect on text messaging Behavior.

Hypothesis (H6): Attitude towards text messaging will have a significant positive correlation with Subjective norms towards text messaging.

3. RESEARCH METHODOLOGY

Structural equation modeling is used as the main statistical technique and data was collected

through questionnaire survey. The questions in the survey are self created. 5 point likert scale was used (1 strongly disagree, 2 disagree, 3 neither agree or disagree, 4 agree and 5 strongly agree) to measure affects of consumer Attitude, Subjective Norm, Intention and Consumer Behavior towards Mobile Text Messaging. The research questions consisted of 18 questions. The first 2 questions are related to demographic variables age and gender. The remaining 16 questions are related to investigate mobile user's attitude, subjective norm, Intention and Behavior towards Mobile Text Messaging. The questionnaire was pretested on 35 respondents to test its consistence and reliability of questions to its research objective.

3.1 SAMPLING AND DATA COLLECTION

A total of 350 questionnaire forms were distributed to students at Auroras' PG College Moosarambagh Hyderabad these students are from different parts of the Andhra Pradesh with age group between 20 to 25 years among them 59 percent are males and 41 percent are females. All the respondents are mobile phone users for at least one year and selected based on convenience sampling method. Respondents are clearly explained about the objective and purpose of the research article before distribution of the article. A total of 329 questionnaires were analyzed for the research as other 21 questionnaires were incomplete.

3.2 DATA ANALYSIS

The data analysis was conducted in a three-stage process. First, reliability tests were performed. Upon satisfactory results, confirmatory factor analysis (CFA) with SPSS Statistics 17.0 was used to analysis the convergent, concurrent and discriminant validity

of the model. Once the model was validated, SPSS Amos 18.0 was used to test the overall fit of the structural equation model and to estimate the relationships between the independent variables and the dependent variable so as to accept or reject the hypothesis.

3.3 RELIABILITY TESTS:

The reliability of 16 items in the questionnaire is tested with Cronbach's alpha (Cronbach, 1951). Cronbach alpha reliability coefficient is 0.896 which is exceeding the suggested level of 0.70. It suggests that the questionnaire is having reliability and can be used for further analysis.

3.4 CONFIRMATORY FACTOR ANALYSIS:

The Kaiser-Meyer-Okin (KMO) and Bartlett's Test is used to test suitability of data for factor analysis. KMO value was 0.871

exceeding the recommended value of 0.60 while Bartlett's Test of sphericity reached statistical significance (Approx. chi-square 1145.048, df 120 and Sig 0.00) which signifies the data is good for conducting factor analysis.

The 16 items were subjected to principal component analysis (PCA) with varimax rotation to test the suitability of data for factor analysis. The PCA revealed the presence of 4 components with Eigen values the exceeding 1, explaining 32.038, 22.160, 19.684 and 7.737 total percentage of variance is 81.619. These components correspond to four constructs in the TRA structural model - Attitude, Subjective Norm, Intention and Behavior towards Mobile Text Messaging. All factors loading of each item are above 0.50. The results of the principal component analysis can be viewed in table 1.

Table 1: Descriptive statistics for the questions in the survey and Factors Analysis

Item No	Component	Mean	S.D	Factor Loads	Eigen Value	% variance
Attitude towards Mobile Text Messaging						
A1	I like Mobile Text Messaging	3.81	0.998	0.765	5.126	32.038
A2	Generally, I find Text Messaging is good	3.88	0.862	0.669		
A3	Using Mobile Text Messaging is enjoyable	3.50	1.155	0.771		
A4	Overall, Mobile Text Messaging is very Important	3.41	1.115	0.612		
Subjective Norms towards Mobile Text Messaging						
S1	If I use Mobile Text Messaging most of the people will consider me to be modern	2.78	1.153	0.714	1.946	22.160
S2	Most of my friends think I should use Mobile Text Messaging for quick communication	3.65	1.118	0.672		
S3	If I use Mobile Text Messaging most of the people will consider as educated person	2.96	1.129	0.754		
S4	If I use Mobile Text Messaging most of the people who are important to me will regard it as useful.	3.58	0.982	0.661		

Mobile Text Messaging Intention						
I1	My general intention to use Mobile Text Messaging is good	3.99	0.979	0.763	1.549	19.684
I2	I intend, the task of sending Mobile Text Messaging is very simple and easy	3.95	0.970	0.900		
I3	I intend to use Mobile Text Messaging in my personal life	3.64	0.970	0.564		
I4	Overall, I intend Mobile Text Messaging is important in my daily life	3.76	1.083	0.816		
Mobile Text Messaging Behavior						
B1	I will think about using Mobile Text Messaging	3.21	1.103	0.803	1.238	7.737
B2	I will use Mobile Text Messaging in the future	3.66	1.064	0.743		
B3	I will recommend others to use Mobile Text Messaging	3.54	1.041	0.615		
B4	I will use Mobile Text Messaging because they are more convenient for communication	3.87	1.100	0.687		
Total % of variance		81.619				

3.5 STRUCTURE EQUATION MODEL

SPSS Amos 18 software is used to perform confirmatory factor analysis using Structural Equation Model (SEM). Total number of variables in the model is 38, number of observed variables 16, number of unobserved variables 22. The data has no missing values. The model is over-identified, a preferable situation for SEM.

According to the univariate and multivariate normality tests the data is not normally distributed. After the data was normalized, the Maximum likelihood (ML) estimation method is used. ML attempts to maximize the likelihood that obtained values of the criterion variable will be correctly predicted.

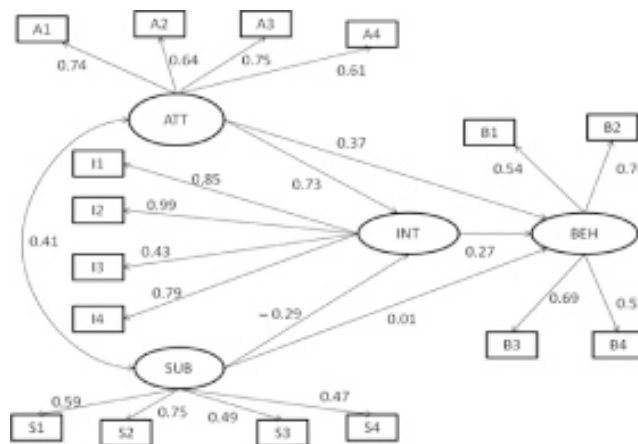


Figure 1: Mobile Text Messaging based on Theory of Reasoned Action Model

3.6 MODEL FIT

Based on Structure Equation Model using SPSS Amos 18 it is found that Chi-square(CMIN) = 97.228, Degree of freedom(DF) = 82 and probability level is about 0.120 which is evidence against the null hypothesis is not significant at the 0.05 level. CMIN/DF is called as the minimum discrepancy which is 1.186 Wheaton et al (1977) suggested that if the minimum discrepancy is less than 5 the model is reasonable fit.

3.7 BASELINE COMPARISONS

The following value are found in our study for each parameter to test model fit

Table-2

Parameter value for model fit in Amos

Name of the Parameter	Value
Goodness of Fit Index (GFI)	0.956
Adjusted Goodness of Fit Index (AGFI)	0.917
Normed Fit Index (NFI)	0.918
Comparative Fit Index (CFI)	0.986
Tucker-Lewis Index(TLI)	0.976
Incremental Fit Index(IFI)	0.986
Relative Fit Index(RFI)	0.980
Root Mean Square Error of Approximation (RMSEA)	0.031

Based on various studies conducted by Bentler and Bonett (1980), Jöreskog, and Sörbom (1984), Bollen's(1989) and Bentler (1990) it was suggested that if the Index value is greater than 0.9 and if RMSEA value is less than 0.05 it indicates model is fit and accepted.

4. FINDINGS

Table-3
Standardized Estimations

			Estimate
intention	<---	subjective_norm	-.292
intention	<---	attitude	.735
Behavior	<---	intention	.267
Behavior	<---	attitude	.366
Behavior	<---	subjective_norm	.014
A1	<---	attitude	.744
A2	<---	attitude	.643
A3	<---	attitude	.754
A4	<---	attitude	.614
S1	<---	subjective_norm	.590
S2	<---	subjective_norm	.754
S3	<---	subjective_norm	.493
S4	<---	subjective_norm	.468
I1	<---	intention	.854
I2	<---	intention	.990
I3	<---	intention	.430
I4	<---	intention	.786
B1	<---	Behavior	.535
B2	<---	Behavior	.764
B3	<---	Behavior	.686
B4	<---	Behavior	.532

Hypothesis1 (H1): Attitude towards text messaging has a significant positive effect on text messaging Intention it is 0.73, Hypothesis one is accepted

Hypothesis2 (H2): Subjective norms towards text messaging is not significant and has negative effect on text messaging intention which is -0.29 and Hypothesis two is not accepted.

Hypothesis 3 (H3): Attitude towards text messaging has a significant positive effect on text

messaging Behavior which is 0.37, Hypothesis three is accepted.

Hypothesis 4 (H4): Subjective norms towards text messaging are not significant and have a very weak positive effect on text messaging Behavior which is 0.01, Hypothesis four is not accepted

Hypothesis 5 (H5): Text Messaging Intention has a significant positive effect on text messaging Behavior which is 0.27, Hypothesis five is accepted.

Hypothesis 6 (H6): Attitude towards text messaging has a significant positive correlation with Subjective norms towards text messaging it is 0.41, Hypothesis six is accepted.

5. DISCUSSION

The Attitude towards Mobile Text Messaging has a positive and very strong effect on Text Messaging Intention and positive strong effect on Text Messaging Behavior. As youth has general tendency to chat and keep in touch with each other's they do frequent SMS with friends. In India many service providers are now giving huge amount of SMS at a very cost per month, since it has lot of advantages than voice call youth frequently hang up with text messaging that is the reason they have positive attitude towards Intention and Behavior of text messaging in India. Indians spending most of their time with mobile phones and they find it is very important device in daily life, apart from talking they have perceived many other benefit from mobile phone text messaging which made this attitude strong for good intention to use mobile phone text messaging and Behavior to adopt it. The research has clearly revealed this fact of high positive effect on Intention and Behavior of text messaging.

Subjective Norm is having negative effect on intention and no effect on text messaging Behavior

because in the society parents does not like their children to hang up with mobile phone always sending SMS and chatting with friends. Dr Scott Frank (2010) research has revealed that hyper text messaging may lead to hyper activities like drugs, smoking, sex, drinking etc so many people does not have positive intention on text messaging and there is no relation between Subjective Norm text messaging and text messaging Behavior.

Text Messaging Intention has a positive effect on Text Messaging Behavior according to Fishbein and Ajzen (1975) Intention is influenced by attitude and subjective norm which determines the effect of intention on Behavior. In this study it was found that Attitude has a correlation of 0.41 which is not very significant this suggests that Attitude and Subject norms are independent from each other.

6. CONCLUSION

This study used the Theory of Reasoned Action model to predict young mobile phone users Text Messaging Behavior in India. Despite of huge growth in mobile subscribers and mobile service providers in India, little research has investigated Text Messaging Behavior in India. The findings of this study contribute to a better understanding of the relationship between Attitude, Subjective Norms, Intention and the Text Messaging Behavior in India among youth. In particular, the finding in this research can help practitioners understand that Attitude has more positive effect on Intention than Subject norm for text messaging were as Subjective norms has negative effect on Intention to use text messaging. Subjective norms have no effect on Behavior. The result of this study suggests that practitioners and academics should focus their efforts on this relationship in TRA model for better understanding the text messaging Behavior of youth in India.

REFERENCES

1. Fishbein, M.& Ajzen,I.(1975). Belief, attitude, intention and behaviour: An Introduction to theory and research. Reading, MA: Addison-Wesley.
2. Ajzen,I.& Fishbein, M. (1997). Attitude-behavior relations: a theoretical analysis and review of empirical research. *Psychological Bulletin*, 84, 888-918.
3. Ajzen, I.& Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs: Prentice-Hall, Inc.
4. Baren, S., Patterson, A., & Harris, K. (2006): Beyond technology acceptance: understanding Consumer practice. *International Journal of Service Industry Management*. Vol. 17 No.2, 2006. Pp.111-135. Emerald Group Publishing Limited.
5. Browne, M. W., and R. Cudeck. (1989). Single sample cross-validation indices for covariance Structures. *Multivariate Behavioral Research*, 24: 445–455.
6. Bentler, P. M., and D. G. Bonett. (1980). Significance tests and goodness of fit in the analysis of Covariance structures. *Psychological Bulletin*, 88: 588–606.
7. Bollen, K. A. (1986).Sample size and Bentler and Bonett’s non-normed fit index. *Psychometrika*, 51: 375–377.
8. Bang, H. K., Ellinger, A., Hadjimarcou, J., & Traichal, P. (2000). Consumer concern, Knowledge, belief, and attitude toward renewable energy: An application of the Reasoned action theory. *Psychology & Marketing*, 17, 449-468.
9. Browne, M., & Cudeck, R. (1993). *Testing structural equation models*. Newbury Park: Sage Publications.
10. Cronbach L.J. (1951). Coefficient Alpha and the Internal Structure of tests. *Psychometrika* 16: 297 – 334.
11. Davis, F.D. (1989): Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Quarterly*; Sep 1989; 13, 3; ABI/INFORM Global pg. 319
12. Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. (1989): User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management of Science*; Aug 1989; 35, 8; ABI/INFORM Global pg.984
13. Davis, R. & Yung, D. (2005): Understanding the Interactivity between Television and Mobile Commerce. *Communications of ACM* July 2005/Vol.48, No. 7
14. Fitzmaurice, J. (2005). Incorporating consumers' motivations into the theory of reasoned Action. *Psychology & Marketing*, 22(11), 911-929.
15. Glanz, K., Lewis, M., & Rimer, B. K. (Eds.) (1997). *Health behavior and health education: Theory, research, and practice*. San Francisco: Jossey-Bass.
16. Gupta, S., & Kim, H. W. (2007). Developing the commitment to virtual community: the Balanced effects of cognition and affect. *Information Resources Management Journal*, 20(1), 28-45.
17. Health Jackal. (2010). Text messaging for teens can lead to risky behavior. Available from <http://www.healthjackal.com/health/2010/11/10/text-messaging-for-teens-can-lead-to-risky-behavior/>. Accessed on 02 Dec 2010.
18. Ilie, V., Van Slyke, C., Green, G., & Lou, H. (2005). Gender difference in perception and Use of communication technologies: A

- diffusion of innovation approach. *Information Resources Management Journal*, 18(3), 13-31.
19. Jöreskog, K. G., and D. Sörbom. (1984). *LISREL-VI user's guide*. 3rd ed. Mooresville, IN: Scientific Software.
 20. Kwok, S. H., & Gao, S. (2005/2006). Attitude towards knowledge sharing behavior. *The Journal of Computer Information Systems*, 46(2), 45-51.
 21. Nysveen, H., Pedersen, P.E., & Thorbjørnsen, H. (2005): Intentions to Use Mobile Services: Antecedents and Cross-Service Comparisons. *Academy of Marketing Science. Journal*; Summer 2005; 33, 3; ABI/INFORM Global.
 22. Njite, D., & Parsa, H. (2005). Structural equation modeling of factors that influence Consumer internet purchase intentions of services. *Journal of Services Research*, 24(6), 43-59.
 23. Pak, H. S. (2000). Relationships among attitudes and subjective norms: testing the Theory of reasoned action across cultures. *Communication Studies*, 51(2), 162-175.
 24. Scott Muska (2011). New Research: Texting, Social Networking can lead to risky behavior by teens. Available on <http://www.altoonamirror.com/page/blogs.detail/display/4932/New-research--texting--social-networking-can-lead-to-risky-behavior-by-teens.html>. Accessed on Jan 2011.
 25. Sinha, (2009). Mobile Market Report – SMS Usage in Urban India . Available from <Http://www.pluggd.in/india-mobile-market-report-sms-as-a-vas-service-297/>, Accessed on 02 Dec 2010.
 26. Song, J., & Kim, Y. J. (2006). Social influence process in the acceptance of a virtual Community service. *Information Systems Front*, 8, 241-152.
 27. Traci Pedersen (2010). Hyper-Texting Associated with Health risk for teens. Available on <http://psychcentral.com/news/2010/11/09/hyper-texting-associated-with-health-risks-for-teens/20729.html>. Accessed on Dec 2010.
 28. Tarkiainen, A., & Sundqvist, S. (2005). Subjective norms, attitudes and intentions of Finnish consumers in buying organic food. *British Food Journal* , 107(11), 808-822.
 29. Venkatesh, V., & Morris, M. (2000). Why don't we ever stop to ask directions? Gender, Social influence, and their role in technology, acceptance model. *MIS Quarterly* , 24(1), 115-139.
 30. Wang, C.-C., Hsu, Y., & Fang, W. (2005). Acceptance of technology with network Externalities: an empirical study. *Journal of Information Technology Theory and Application*, 6(4), 15-28.
 31. Wheaton, B. (1987). Assessment of fit in over identified models with latent variables. *Sociological Methods and Research*, 16: 118–154.
 32. Wu, J., & Liu, D. (2007). The effects of trust and enjoyment on intention to play online Games. *Journal of Electronic Commerce Research*, 8(2), 128-140.
 33. Xu, Y., & Paulins, V. A. (2005). College students' attitudes toward shopping online for Apparel products: Exploring a rural versus urban campus. *Journal of Fashion Marking and Management*, 9(4), 420-433.
 34. Yan, X., Gong, M., & Thong, J.Y.L. (2006): Two tales of one service: user acceptance of Short message service (SMS) in Hong Kong and China. Vol.8, NO. 1 2006, pp. 16-28, Emerald Group Publishing Limited.