Sayan Chakraborty. Mobile phone usage patterns amongst university students: A comparative study between India and USA. A Master's Paper for the M.S. in I.S degree. April, 2006. 53 pages. Advisor: Diane Kelly

Mobile phones are one of the most common information access devices with almost 31% of the global population having access. This exploratory study investigated usage patterns of, and attitude about, cell phones among university students in a mature market (United States) and a rapidly growing new market (India) by surveying students in each country. Key findings from the study include similarities in the usage of phones to communicate with others and in the perception of mobile phone usage in public settings, and differences in the use of text messaging and opinions regarding driving and mobile phone usage. Overall these results suggest students in India use mobile phones differently from their American counterparts. In a developing market like India, mobile phones may be the primary and only phone to which students have access.

Headings:

Information science / International aspects

Multiculturism

Surveys/Knowledge Management

India

United States

University students

MOBILE PHONE USAGE PATTERNS AMONGST UNIVERSITY STUDENTS: A COMPARATIVE STUDY BETWEEN INDIA AND USA

by
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Approved by

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Table of Contents

Introduction

Mobile phone technologies are now in the hands of almost 31% or 2 billion people (Motorola, 2006) of the 6.47 billion people on this planet ("Population Reference Bureau Statistics", 2006). The penetration of these technologies is increasing very rapidly with around 779 million ("Gartner Press Release", 2005) mobile phones sold every year and expected to reach over 1 billion units per year sold by 2009. These staggering numbers are indicator of the growth and reach of mobile phones.

Asia is the fastest-growing region, accounted for one of every four phones sold in 2005, a pace that is projected to increase to one of three by 2009 ("Gartner Press Release", 2005). The latest data from March 2006 indicates that India is the fastest growing mobile market in the world with over 5 million new users added per month bringing the total to over 90 million users ("Telecom Regulatory Authority of India press release", 2006). However this represents only about 8% of India's estimated total mid-2005 population ("Population Reference Bureau Statistics", 2006). The corresponding US data from December 2005 shows that there are 207 million mobile users in the US ("CTIA Semi-Annual Wireless Industry Survey", 2006).

This represents over 69.8% of the estimated total mid-2005 US population ("Population Reference Bureau Statistics", 2006).

The cultural background can influence the way technology is perceived, adopted and used. Despite the global nature of the adoption of mobile technologies, there are only a few studies which have investigated the cross-cultural aspects. The study hopes to address a variety of questions revolving around two general areas of interest as identified by Aoki and Downes (2002)- the intrinsic motivations for the adoption of mobile phones and the behavioral characteristics of their usage. Aoki and Downes (2002) studied these areas of interest in the context of college students in the US. This study will extend the previous research to include a cross-cultural comparison of university students in the United States and India. Knowing the intrinsic motivation for adopting technology may help in gaining a better understanding of why a technology is used a certain way by a particular group of people. The behavioral characteristics include usage data such as length of cell phone usage, typical time of cell phone use, average number of calls received/sent, typical location of cell phone use, use and number of text messages.

Mobile phones have an intrinsic social impact by the way the technologies emphasize portability and constant communication. The portable nature of this communication medium means that they are often used in public spaces. People

may be involved in mobile communication as either users or participants in a public space with other users. Some mobile phone users may embrace a resultant redefining of their personal space. While other users may consider mobile phone communication a privileged personal space and so share their mobile phone numbers only with their close friends and family. Cooper (2002) states, ''the use of the mobile in certain public spaces makes the relation of private and public slightly different'' (p. 22). This leads to questions about the attitudes regarding the usage of mobile phones in a public setting.

Mobile phones today go beyond just voice communication and provide a multitude of other features and services including text messaging (SMS), multimedia messaging (MMS), photo display and recording, video playback and recording, calendaring, etc. The paper will also seek out the usage patterns of mobile phones as an information access device with respect to these features.

The study hopes to address a variety of questions: What are the most common uses of mobile phones amongst the university students in a mature versus a developing market? What patterns can be found across cultures and demographics? Are there any cross-cultural differences in the perception of phone usage in public places? What is the prevalence of non-traditional or non-voice applications of mobile phones in the studied sample?

Literature Review

Mobile phones may be categorized as common communication medium for almost 31% of the global population uses them (Motorola, 2006). Townsend (2002) mentions that the diffusion of the mobile phone was among the fastest of any technology in history. Such a rapidly evolving and wide spread communication technology and medium has important social contexts and implications.

Aoki and Downes (2004) noted that mobile phone usage in social contexts has been a less studied area when compared to the research on the engineering and policy aspects of mobile technologies. McGuigan (2005) pointed out that it is quite difficult to find critical research which looks into the cultural value and social purpose of mobile phones. Only recently, research has been published on how people use mobile phones in their daily life. However, a majority of these studies have focused on studying populations within a relatively homogeneous culture. Weilenmann, A., & Larsson, C. (2001) conducted field studies of public use of mobile phones among teenagers in Sweden. Their study shed light on how the mobile phone has come to be used as a tool for local social interaction, rather than merely as a device for communication with dislocated others. Their observations pointed towards the collaborative nature of mobile phone use. The researchers examined how phones were shared and how their field data could be

of use when designing new mobile technology and services for the youth.

Katz (1997) explored the possible effects of wireless communication on people's lives. He identified several levels of effects of such a technology. The 'first-order effects' are direct effects that are immediately perceived by users, they include uncertainty reduction, personal security, and personal efficiency. The 'second-order effects' are indirect effects which represent the experiences or feelings that people have or may observe in others, they include tighter coupling of domestic production, information immediacy, and contactability. The 'third-order effects' are the least direct effects that are observed not by users of the technology but by outside observers who study the effects of the technology on the society in general, they include social interaction, social control, and innovative uses or unanticipated usage.

Mobile phones are redefining and blurring the line between public and private spaces. Cooper (2002) mentioned that people in public space may be unexpectedly exposed to one side of a two-party private interaction, which can be frustrating with speculations about the missing side of the interaction. Fortunati (2002) noted that mobile phones favored the progressive encroachment of intimacy in the public sphere.

Palen, Salzman and Youngs (2000) have looked into this issue and the perception of mobile phone usage in the public. They studied the behavior of

new mobile users over a period of six weeks after acquisition of phones. Using interviews and voice-mail, their study noted that patterns of mobile phone usage varied over time and there was significant deviation between the user-predicted usage to their actual usage. The researchers also studied how the perception of mobile phone usage in public contexts varied over the duration of the study. Initially, the perception was overwhelmingly negative. However, they noted that new users over a period of time became more accepting of the use of mobile phones in public places. Their study found people initially adopted cell phones for safety/security and business or job-related reasons instead of social reasons. However, nearly all subjects in their study reported the use of their cell phones for social interactions had grown over a period of time.

These interactions may not even be the traditional voice based interaction. Puro (2002) noted that Finland has one of highest mobile phone densities in the world, reaching over 90% of the people under 30 years of age. Taylor and Harper (2001) noted that young people use text messaging on mobile phones as forms of gifts to cement social relationships.

Aoki and Downes (2004) focused on the behavioral and psychological aspects of cell phone usage among college students. They tried to find the reasons behind why a technology is adopted in a particular way. They identified several attitudinal factors based on the exploratory study including, necessity in

modern times, cost efficiency when compared to landline phone, safety or security, and dependency. The study also endeavored to look at the motivational and behavioral characteristics of mobile phone usage. The authors tried to combine their results and the result of previous research to find the trends in usage by the youth, "why college students in the US use the cell phone, what they think of the technology, and how they use it" (p. 352). The motivational themes identified by the study include personal safety, financial incentive, information access, social interaction, parental contacts, time management/coordination, dependency, image, and privacy management. The results of the focus group interviews indicated five distinct user groups in terms of their attitudes toward their cell phone usage and in terms of the levels of integrating cell phones into their lives.

Aoki and Downes (2002) enumerate the groups as the cost-conscious group, safety/security conscious, dependent, sophisticated, and practical users. The cost-conscious users believe that a mobile phone helps them save money. The safety/security conscious users are cognizant of their own security and having a cell phone gives them a feeling of security. The dependent user is a person who is reliant on his/her phone and feels disconnected to the world without one. The sophisticated users have had their phones for the longest time and feel it is absolutely a necessity for functioning in the world. The practical

user believes a mobile phone gives cost saving, safety benefits, and time efficiency. This study serves as a valuable guideline on how questionnaires focusing on mobile phone use may be designed by using focus interviews.

The global nature of mobile technologies makes the cross-cultural study of the behavioral characteristics of mobile phone usage a topic of current interest. Venkatesh (1995) noted that consumer behaviors are primarily socio-cultural phenomena that must, therefore, be discussed in socio-cultural terms. He emphasized cross-cultural studies should include at least two different cultures as part of the same field study, although it is possible to conduct a comparative study using a single cultural setting and make comparisons with other cultures using textual information rather than field data. He also explained that cross-cultural studies may incorporate cross-national comparisons which studies variables that are objective measures that need no cross-cultural translation.

Studies in the realm of mobile phone technologies are only recently starting to appear. Issac, Nickerson, and Tarasewich (2004) studied cell phone usage in social settings in two developed countries – United States and France. Their research focused on the cell phones used in social settings, the perception of the acceptable use of mobile phones in social settings. They studied whether the use and attitudes related to the use of cell phones vary by country. Their survey indicated significant differences between users in United States and

France when it came to using phones in public streets or while driving an automobile. French users had a significantly negative view of using mobile phones while driving, this may be attributed to the fact that it is illegal in France to drive and talk on a phone simultaneously. Variances were also observed in the use of and attitudes toward the use of mobile phones for both voice calls and text messaging. French users were more likely to use text messaging in all the scenarios studied except while driving. The researchers explained that, some of the differences may be attributed to cultural and legal differences between these countries, other factors such as age or the length of time that someone has used a cell phone may be important.

Carlson, Kahn, and Rowe (1999) studied the organizational behavior aspect by observing the impact of mobile phones on decision making in sales forces within organizations in United States and France. They compared the differences in sales force behavior. Correlations were conducted to determine whether the country, length of time the technology has been used, or their interactions were the major effect. Their study showed that new technology adoption was responsible for a shortening of decision making time in both countries. On the other hand, differences in standardization, formalization and decision making time were identified. The results of the study indicated that cultural differences between countries accounted for most of the differences.

Hofvenschiold (2003) studied the affect of cultural background and occupational status on the way people interact and perceive technology. She surveyed university students and young professionals from Germany and the United Kingdom to study the attitude to and use of cell phones. Differences in attitudes were measurable when emotional and motivational aspects of mobile phone use were explored.

Castells, Mireia, Qiu, and Sey (2004) produced a detailed compilation of existing research evidence of the social aspects of wireless communication technologies including mobile phones. They indicated cultural differences in communication style preferences had an impact on the adoption rates of wireless technologies. The researchers intended to elicit general patterns for the social differentiation of wireless diffusion in different societies of Europe, America, and the Asia Pacific regions. They cite numerous studies indicating that text messaging is more prevalent among the youth across countries. Other findings include the high incidence of phone-borrowing in parts of Europe; impact on trip planning in travelers and mobile workers; popularity of mobile Internet in Japan; mobile phone as extension of personal identity in Japan; and usage of phones for communication and as status symbols by migrant workers in China. Castells, Mireia, Qiu, and Sey (2004) extensively looked into the rise of the mobile youth in a cross-cultural perspective. Their stated hypothesis was that "there is a youth

culture that finds in mobile communication an adequate form of expression and reinforcement." They indicate that much of the research into this youth culture has focused on Europe. The researchers cite evidence for the emergence of collective identity resulting from peer-grouping based on networked sociability. They examine evidence in the United States where owning a mobile phone for a teenager has become a rite of passage. This compilation brings up a wide variety of unique culture attributes for each of the countries or regions studied. However, there is little by the way of direct cross-cultural comparison for specific demographic segments.

The literature review shows that the usage of mobile phone technology has a significant societal influence. The ubiquitous and always-connected nature of the technology is shaping attitudinal changes regarding public and private space of mobile phone users. The importance of this area and the study of the behavioral characteristics involved are being just realized. However relatively few studies are available which look at this issue from a cross-cultural perspective, especially the youth segment of the mobile phone user market. Most of the previous studies were conducted in European countries and the United States. A cross-cultural study between users in India and United States will enable a comparative perspective into a mature and developing market.

Importance of study

This study investigated motivations of usage, common usage scenarios and the attitude towards mobile phones in public settings among university students in a mature market (United States) and a rapidly growing new market (India). The author believes that the study will contribute valuable learnings about the field of mobile communication to the broader academic knowledge-base. This research may serve as useful input to telecommunication companies, researchers (information science, social communication, etc) and media futurists. This study may help information architects in designing interfaces to meet the unique needs of the particular market.

The advantages of this study are that this will contribute previously unavailable data to the field. To the best of the author's knowledge, no study has compared the mobile phone usage between a developed mature market and a rapidly developing market. This study is easy to replicate and scale up, to retrieve similar data from other regions of the world.

Method

This research is indented to be a questionnaire-based exploratory study to investigate the cross-cultural usage patterns of mobile phones. The study collected basic demographic, motivational and behavioral characteristics from the respondents. Motivational questions in the questionnaire were based on findings of focus group interviews conducted by Aoki and Downes (2004). The behavioral questions were based on the sections suggested in the report of Bautsch et al., (2001). The three behavioral sections defined were usage, safety issues, public perception of mobile phones and socially acceptable usage guidelines or etiquette. Additional questions were based on other relevant research. Shared use was incorporated based on the study of phone borrowing by Castells, Mireia, Qiu, and Sey (2004). The cross-cultural perspectives of text messaging and phone usage while driving were based on the study of French and American users by Issac, Nickerson, and Tarasewich (2004). The complete survey questionnaire can be viewed in Appendix A.

Participants for the study included students at universities in the United States and India. Only university students above the age of 18 years from India and the United States were included in the study. Responses were accepted regardless of full-time or part-time, undergraduate or graduate student status. Subjects were presumed to have basic knowledge of the English language. This

was a reasonable assumption since English is the medium of instruction at universities in both countries. Basic reading, writing and web browsing skills were the only pre-requisites for participating in the study.

An ideal sampling frame could draw on the student rosters at universities. However, student rosters are not available publicly. Keeping in mind this constraint, non-probability based convenience sampling was used. Thus, the sampling frame comprised of student volunteers from at least one university each in India and United States. In both the cases the recruitment was initially started using the author's acquaintances and progressively more respondents were added using snow-balling technique. Acquaintances were encouraged to forward the request to their friends. Request to participate in the survey were mailed out on open student mailing lists or internet groups for US and Indian students (see Appendix B). The survey was closed after receiving a total of 102 responses. 50 responses each were received from India and the United States, however 2 respondents did not mention their countries and their responses were omitted from the study.

Survey

The survey had an introduction giving a brief overview of the proposed study, contact details and the Institutional Review Board's approval number (Study #: 05-0956). This was followed by an explanation of the process of filling

out the survey and the statement that the respondent may choose to end the survey at any time and no data would be collected. The respondents could then continue to the survey questions on confirming that they had read the instructions and terms. No personally identifiable data was collected. No compensation for responding to the survey was offered.

The survey had both closed and open ended questions. It collected demographic information like age, gender and education level. Then the survey moved on to collect usage and behavioral characteristics such as, individual use or shared use phone, and time of use. Respondents were also asked to rank their predominant usage of the phone. The options included the following: staying in touch with friends, staying in touch with family, discuss schoolwork, office-related work (if working part-time), retrieve sports scores and news, check email, listen to music, watch video, calendaring and appointments, clock and alarm, and any other use. Etiquette issues and the perception of talking on the phone in public places were also collected. The survey questionnaire was pre-tested with 2 university students each in the United States and India. The study did not incorporate any follow-up procedure after administering the questionnaire. Estimated time required to fill out the study questionnaire was 10 minutes.

Results

The survey received a total of 102 responses over a two-week period. 50 responses each were received from India and the United States, however an additional 2 respondents did not mention their countries (refer to table 1). As the study attempts to do a cross-cultural analysis, the responses with undisclosed countries have been dropped from the data analysis. Therefore, the total number of analyzed responses is 100.

Table 1: Location

Location of university		
Answer	**Count**	**Percentage**
No answer	2	1.96%
India	50	49.02%
United States	50	49.02%
Other	0	0%

Demographic Information

The study used non-random convenience sampling therefore the respondents are not representative of their populations. The 100 total respondents included 57 men and 43 women. The majority (76%) of the respondents from India were male whereas most of the respondents (62%) from the United States were female. The average American respondent was 28.68 years old and the average Indian respondent was 23.7 years old. The respondents from the United States had a greater range of ages with a standard deviation of 7.17 compared the standard deviation of 2.27 among the Indian respondents.

Detailed demographic distribution of gender, age and education levels are shown below (Table 2 to Table 3 and Figure 1)

Table 2: Gender

Gender		
Country	**Male (percent)**	**Female (percent)**
India	38 (76%)	12 (24%)
United States	19 (38%)	31 (62%)
Total (Percent)	57 (57%)	43 (43%)

Table 3: Age

Age			
Statistic	**India**	**USA**	**Total**
Average	23.7	28.68	26.19
Standard Deviation	2.27	7.17	5.87
Minimum	19	22	19
Maximum	28	59	59

The frequency and cross-tab table of education level of the respondents shows that all the respondents from the United States barring one were graduate students. The respondents from India show a more varied education level. The majority of respondents (94% in India and 88% in US) indicated that they own the phones they use (refer to figure 2).

Figure 1: Educational Level

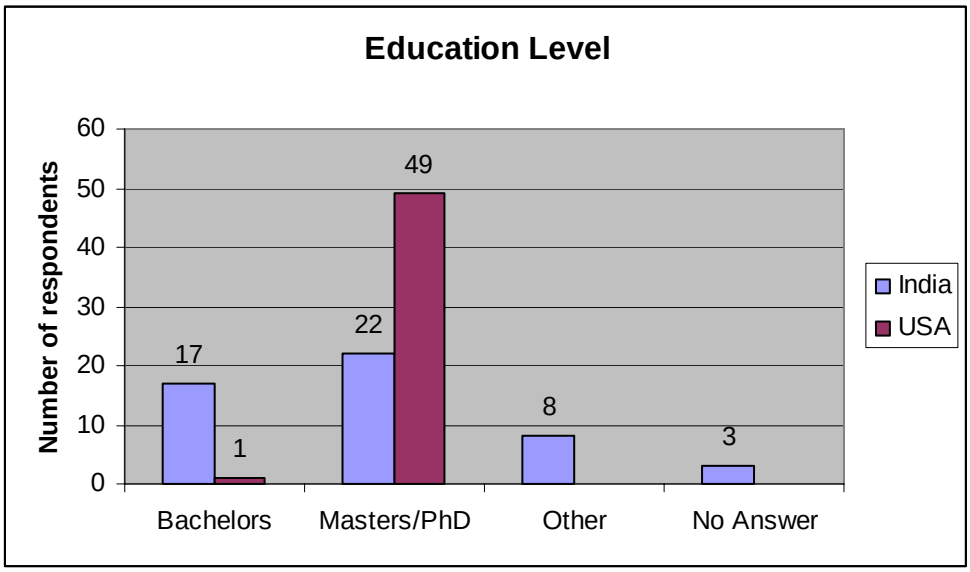
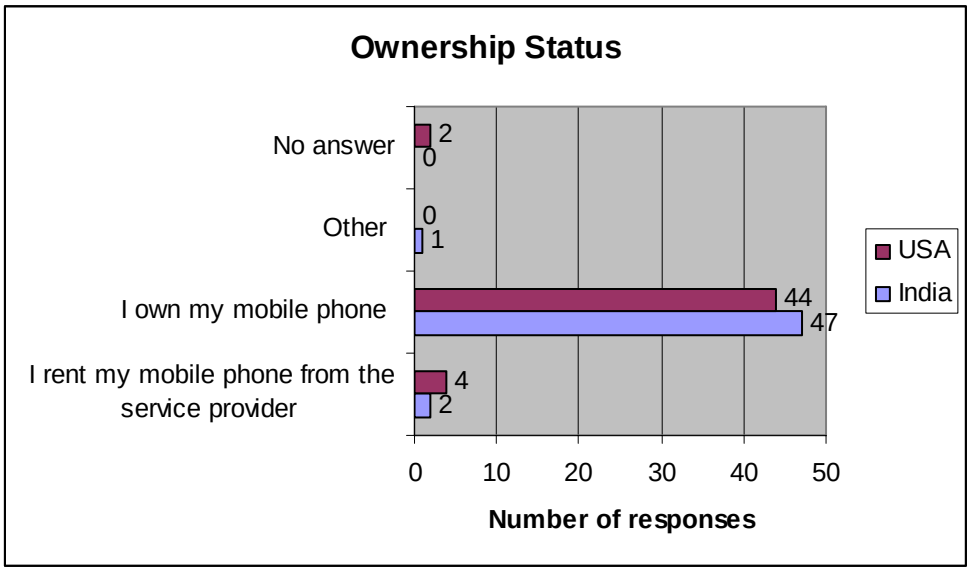


Figure 2: Ownership status



Usage of phones

Most of the respondents indicated that they do not share their phones with anyone (see table 3). A few interesting qualitative responses were received for the shared usage of phones, all the respondents who share their phone

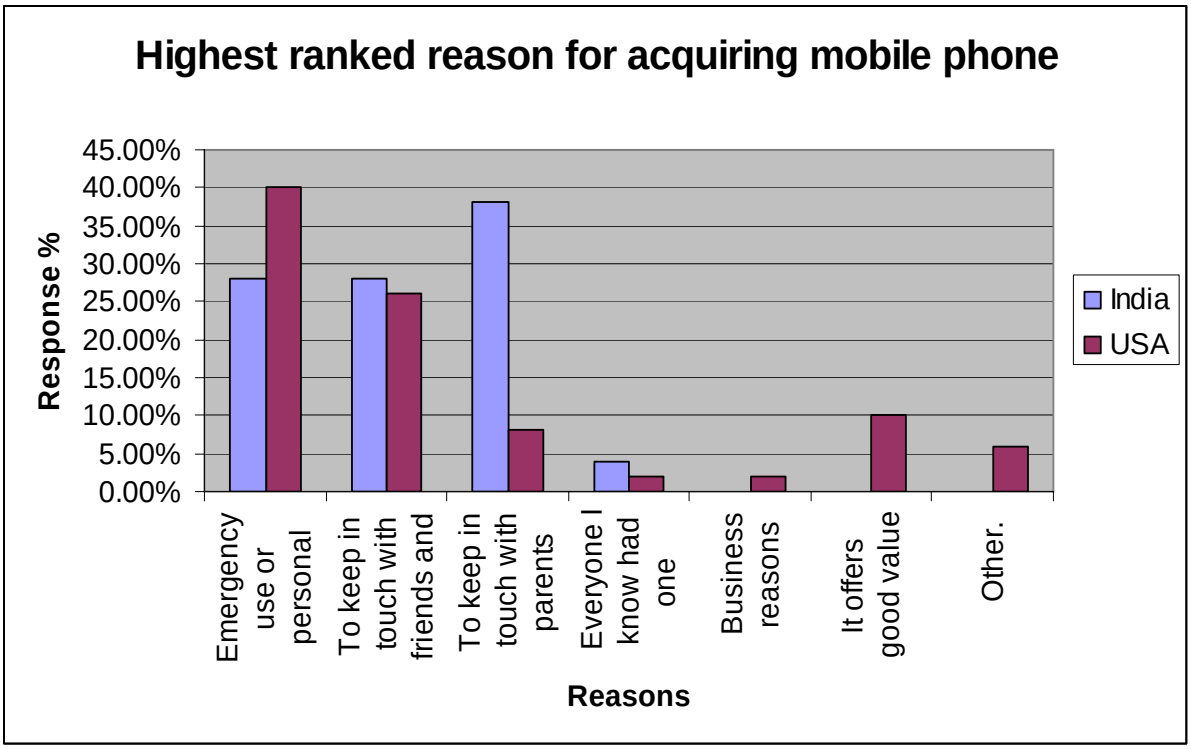
revealed that they share it with only close family members.

Table 3: Shared use of phone

Shared usage			
Response	**India (percent)**	**USA (percent)**	**Total (percent)**
I do not share my mobile phone with anyone.	45 (90%)	46 (92%)	91 (91%)
I share my mobile phone.	4 (8%)	2 (4%)	6 (6%)
No answer	1 (2%)	2(4%)	3(3%)
Total	50 (100%)	50 (100%)	100 (100%)

When respondents were asked about the reason for acquiring mobile phones, most of the responses indicated the need to use to stay in touch with family and friends, and the need to use in case of emergency or personal safety. Twenty five percent of students in India indicated use in emergency as the most important reason for acquiring a mobile phone compared to 40% students in the United States. An interesting result was, 38% of Indian students choose 'staying in touch with parents' as the highest ranked reason for acquiring a mobile phone compared with only 8% of American students (refer to figure 3). Six respondents from the United States gave reasons other than the ones specified the highest rank, including free long distance (2 responses), easy/cheaper to stay in touch with close family members (3 responses), and take pictures (1 response).

Figure 3: Highest ranked reason for acquiring a mobile phone



Respondents were also asked to mention how long they have been using phones. Most respondents had extensive experience with more than 80% reporting using a phone for more than 1 year (see table 4).

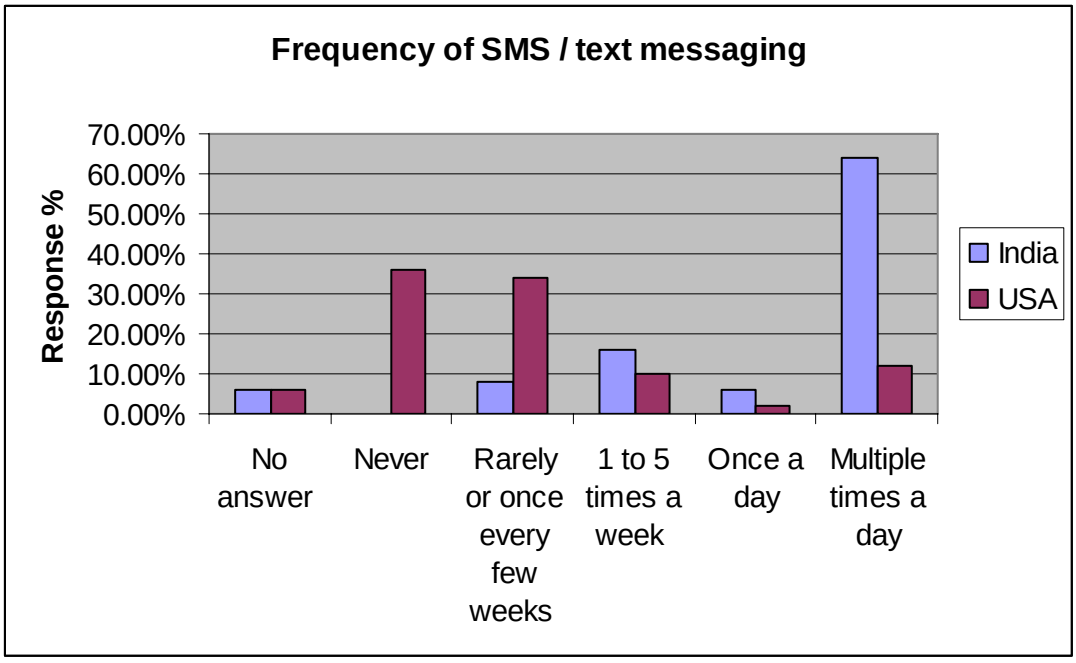
Table 4: Duration of usage / experience

Duration of usage / experience	India	USA
Less than 1 month	6%	0%
More than 1 month but less than 3 months	0%	0%
More than 3 months but less than 6 months	0%	0%
More than 6 months but less than 1 year	6%	8%
More than 1 year	84%	86%
No answer	4%	6%

The study asked about non-voice related uses especially text messaging. Results are displayed in Figure 4. Respondents from India show a greater use of

text messaging than their counterparts in the United States (refer table 16). 32 respondents (64% of respondents from India) reported using SMS service multiple times a time compared to a corresponding 12% (6 respondents) from the United States. 36% of US respondents reported never using text messaging, compared to none from India.

Figure 4: Frequency of SMS / text messaging



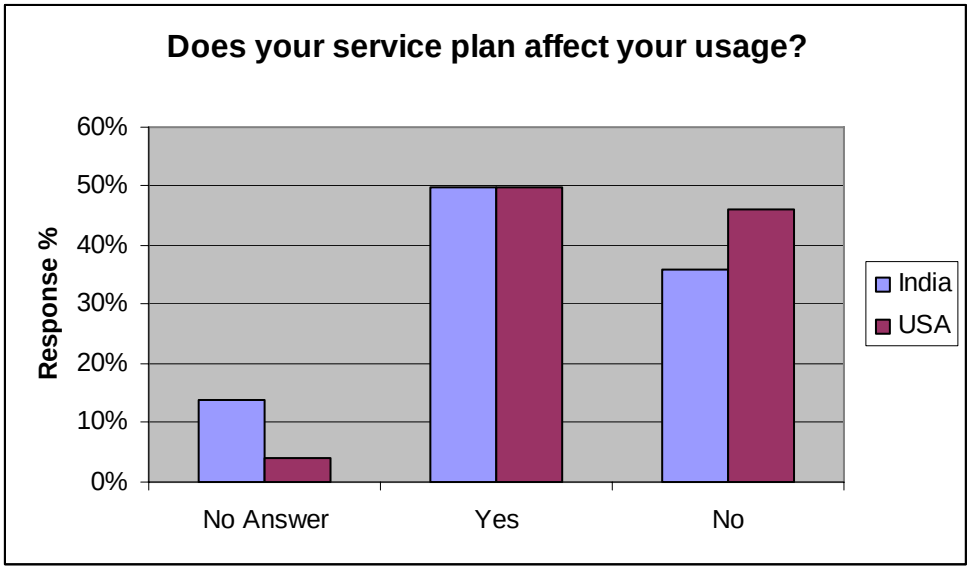
The survey also attempted to elicit the most common usage scenarios for the phones among the respondents. Staying in touch with friends or family were the highest ranked common usage scenarios across both the countries (see Table 5).

Table 5: Highest ranked usage scenario

What are your common mobile phone usage scenarios?	India	USA
staying in touch with friends	38%	46%
staying in touch with family	48%	40%
Discuss schoolwork	4%	2%
office-related work (if working)	2%	0%
web-browsing	2%	0%
calendaring and appointments	0%	2%
clock and alarm	0%	6%

When respondents were asked whether the mobile service provider's service plan affected the usage, respondents from both countries had similar affirmative responses (see Figure 5).

Figure 5: Does service plan affect usage?



Some interesting responses were received for ranking scenarios where respondents would keep their phones in mute or vibration mode (refer to table 6). A large percentage of respondents (70% from India and 66% from the United States) keep their phones in mute / vibrate mode while attending classes, similar

figures (70% from India and 60% from the United States) were disclosed for a movie or concert scenario. Some respondents noted that they keep their phones in mute / vibrate mode while in a meeting.

Table 6: Scenarios where phone is kept mute / vibration mode

Scenarios when phone is in mute or vibration mode		
Scenario	**India**	**USA**
While in class	70%	66%
While at work	46%	54%
At a movie or a concert	70%	60%
While driving	16%	4%
While sleeping	18%	8%
Other	16%	22%
Phone is never in mute or vibration mode	6%	6%
Total	100%	100%

Another question asked respondents to choose scenarios where they would turn off their phones (refer to table 7). 68% of respondents from India said that they never turn off their phones in contrast to 38% of US respondents (refer to table 7). None of the responses from India indicated that they would turn off their phones at a movie or a concert while 36% of US responses said they would turn it off in such a scenario. The comments indicated that respondents turn off their phones while traveling in an airplane.

Table 7: Scenarios when phone is turned off

Scenarios when phone is turned off		
	India	**USA**
My phone is never switched off	68%	38%
While in class	10%	30%
While at work	0%	18%
At a movie or a concert	0%	36%
While driving	0%	2%
While sleeping	8%	20%
Other	12%	20%
Total	100%	100%

Respondents from both India and the United States indicated that they use phones more in the evening than any other time of the day (76% and 86% respectively) (see table 8). The least used time of the day was morning with only 44% and 48% responses from India and the United States.

Table 8: Commonly reported time of use

What time of day do you usually use your mobile phone?	India	USA
Morning	44%	48%
Afternoon	58%	56%
Evening	76%	86%
Late night	62%	50%

Most respondents across countries, 76% of Indians and 68% of Americans indicated that their mobile phones were their primary phones (refer to table 9).

Table 9: Mobile phone as primary phone

Is your mobile phone your primary phone?	India	USA
Yes	76%	68%
No	16%	28%
No answer	8%	4%
Other	0%	0%

Similarly most respondents (72% Indian and 76% American) indicated satisfaction with their service provider (refer to table 10).

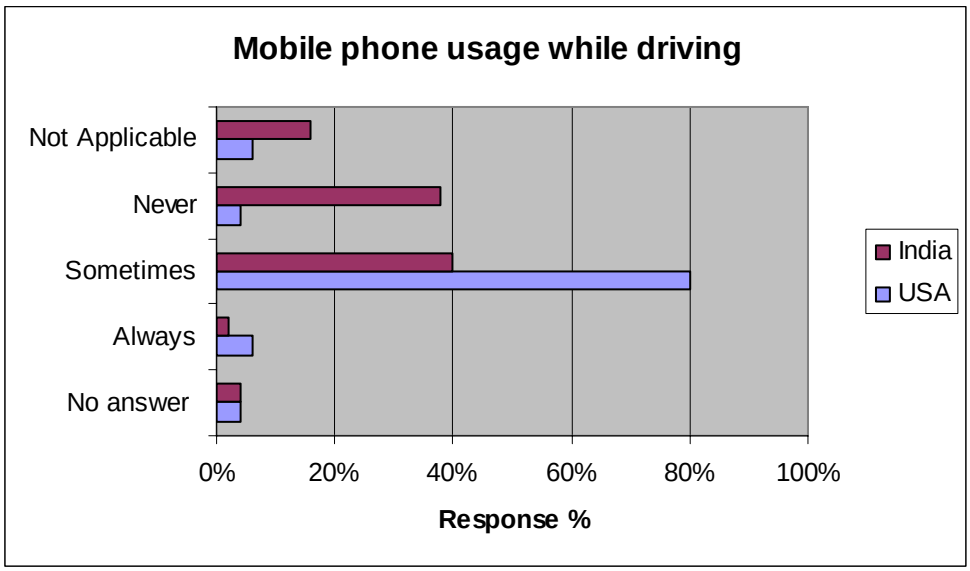
Table 10: Satisfaction with service provider

Are you happy with your service provider?	India	USA
Yes	72%	76%
No	18%	16%
No answer	6%	4%
Don't know / Other	4%	4%

Safety issues

Eighty percent of respondents from the United States indicated that they use mobile phones sometimes while driving whereas only 40% of respondents from India report the same (see figure 6). 40% of respondents from India report that they never use mobile phones while driving compared to 40% of respondents from the United States.

Figure 6: Mobile phone usage while driving



The questionnaire asked respondents about making and receiving calls while driving. Seventy-two percent of US respondents replied that they sometimes make and receive calls while driving compared to 46% of Indian respondents (refer to figure 7). Thirty-two percent of Indian respondents and only 10% of US respondents said that they never make and receive calls while driving.

Forty six percent of respondents from the United States said that they sometimes feel safe while driving and using a mobile phone compared to only 20% of Indian respondents (refer to figure 8). 44% and 32% of Indian and US respondents indicated that they never feel safe while driving and using a mobile phone.

Figure 7: Make and receive calls while driving

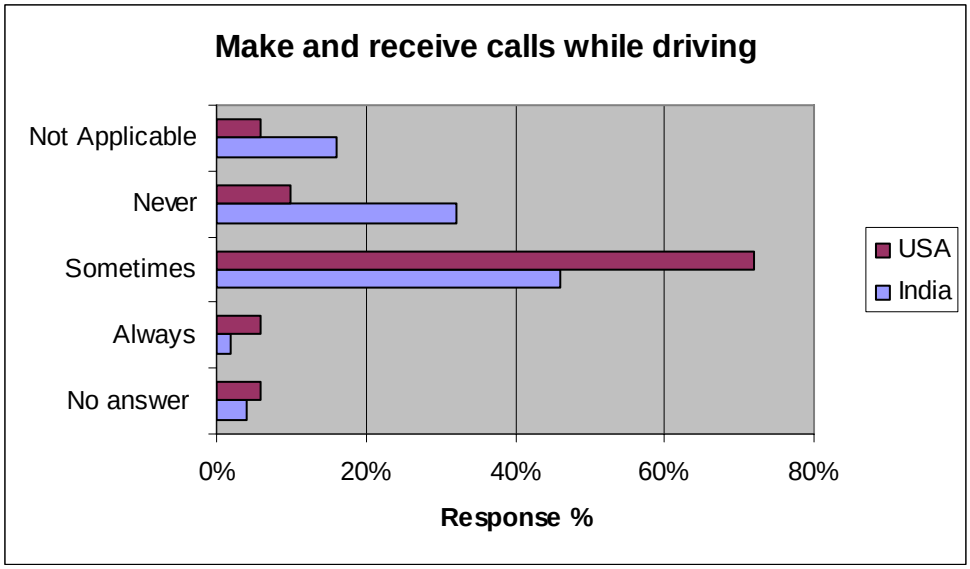
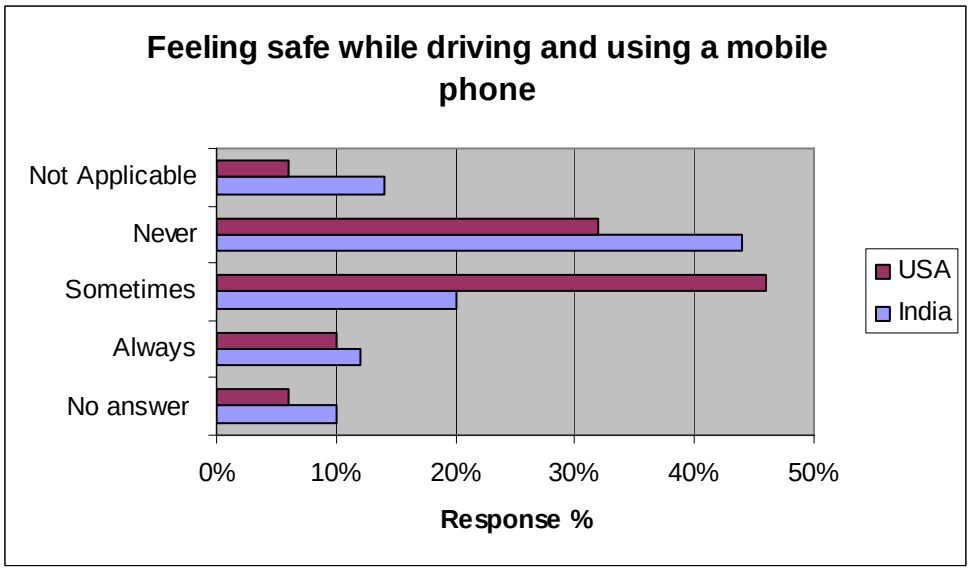


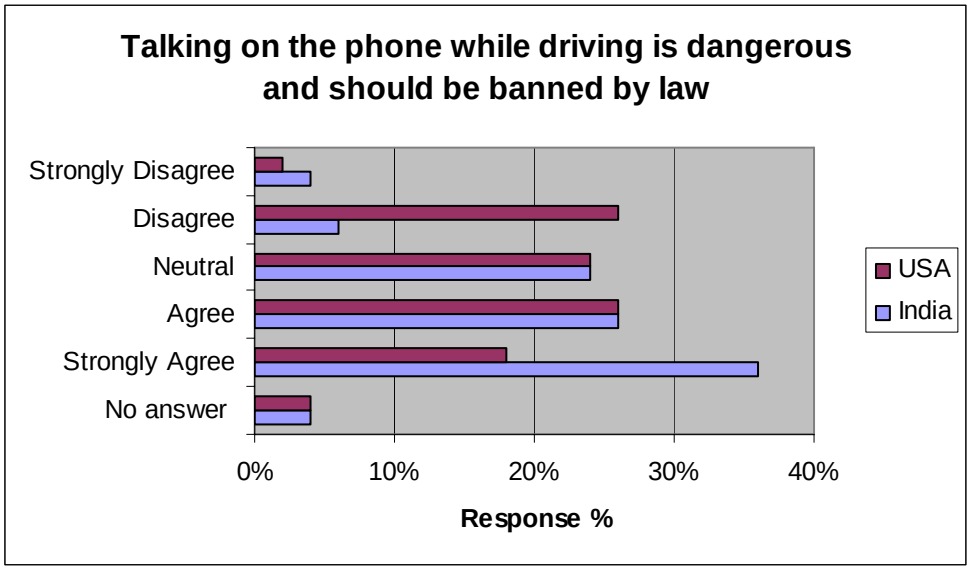
Figure 8: Feeling safe while driving and using a mobile phone



Respondents were asked to give their opinion on two statements regarding talking on the phone while driving (see figure 9). Thirty-six percent of Indian respondents compared to only 18% of US respondents strongly agreed that talking on the phone while driving is dangerous and should be banned by law. 26% percent of the US respondents

disagreed with the statement compared to 6% of the respondents from India.

Figure 9: Talking on phone while driving is dangerous and should be banned by law

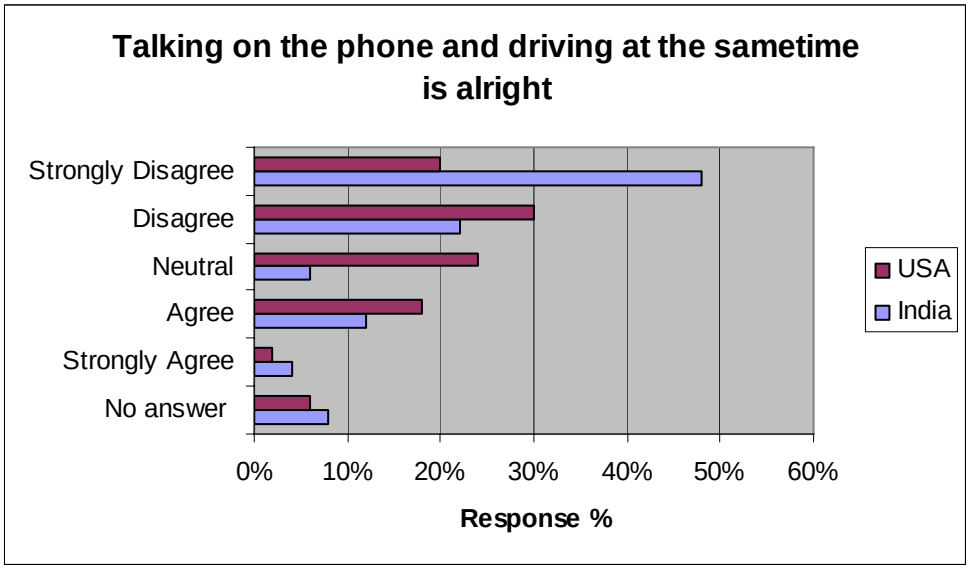


Respondents were asked to share their opinions of the statement, 'talking on the phone and driving at the same time is alright.' 48% of respondents from India strongly disagreed with the statement compared with only 20% of respondents from the United States (see figure 10). 24% of US respondents were neutral to the statement whereas only 6% of Indian respondents had a neutral opinion.

Respondents were requested to give their own subject comments and opinion regarding using a mobile phone while driving. 71 of the 74 total comments received mentioned that they think it is either best avoided or it is not safe or it may be distracting. Two respondents suggested the use of a hands-free mobile phone. There were some interesting views among the 71 comments, one respondent said he/she prefers not to use the phone after dark or in curvy roads.

Another person remarked, "earlier old people or new drivers were a problem on the road but now they have been replaced by a person using a mobile phone." Some respondents said that it is just too dangerous and only emergency calls should be allowed.

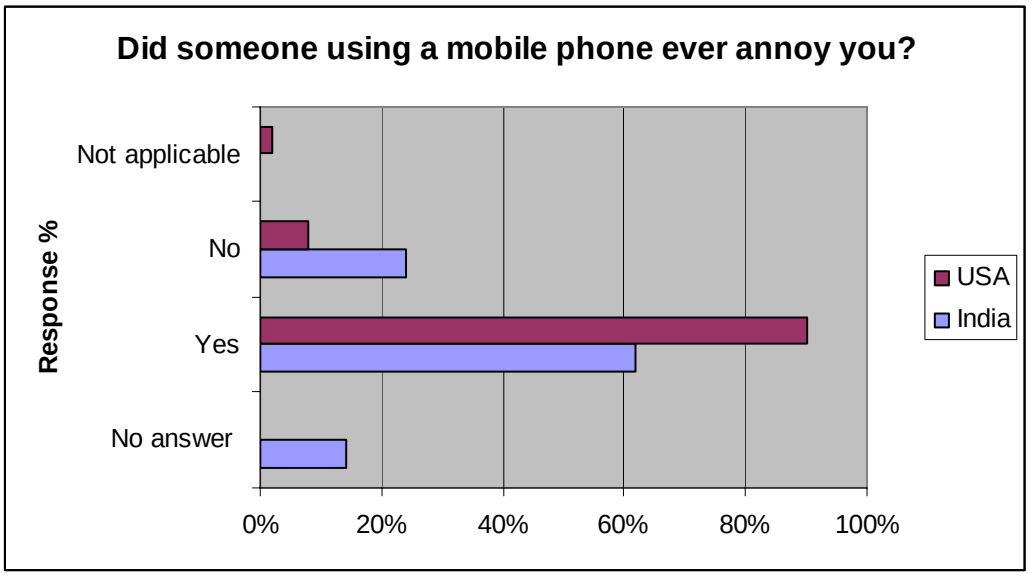
Figure 10: Talking on the phone and driving at the same time is alright



Public and social perception

Respondents were asked if they were ever annoyed by someone using a mobile phone. Ninety percent of the US respondents and 62% of Indian respondents replied in the affirmative (refer to figure 11). 24% of respondents from India and 8% of US respondents said they were never annoyed by a person using a mobile phone.

Figure 11: Did someone using a mobile phone ever annoy you?



Respondents were asked their level of agreement or disagreement to the statement that talking on phones in public places should be banned by law. Forty six percent and forty two percent of US and Indian respondents strong disagreed (see figure 12). If strongly disagree and disagree categories are combined then 68% of respondents from India and 80% of US respondents disagree to the statement.

Thirty two percent of Indian respondents and 24% of US respondents strongly agreed to only allowing discreet or quiet talking on phones in public places (refer to figure 13). A further 32% each of respondents from both countries agreed to the statement.

Figure 12: Talking on phones in public places should be banned by law

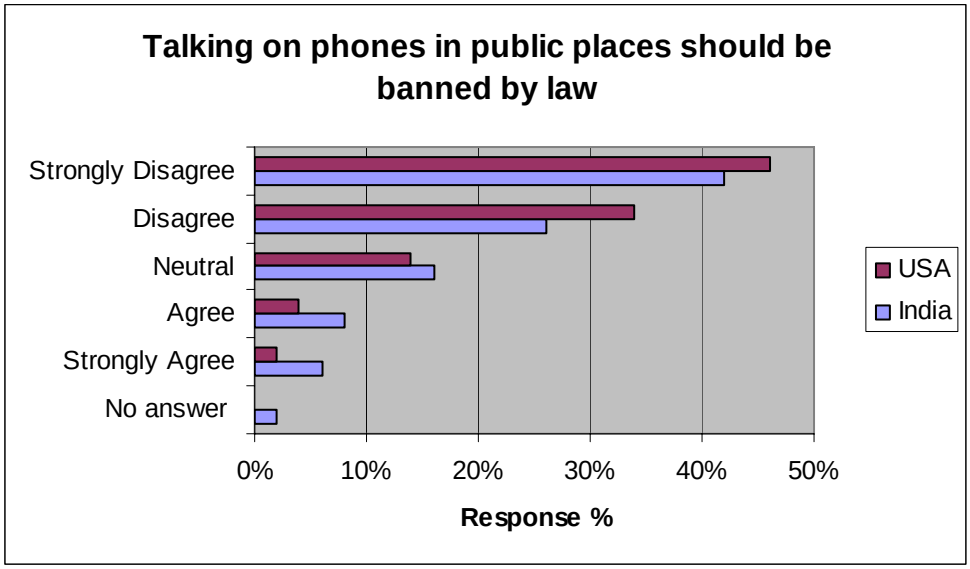
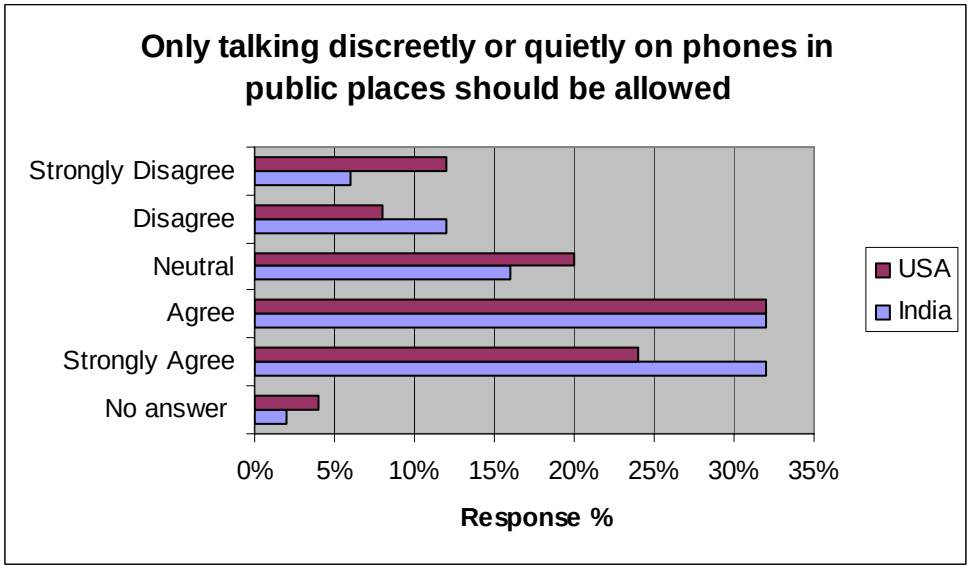
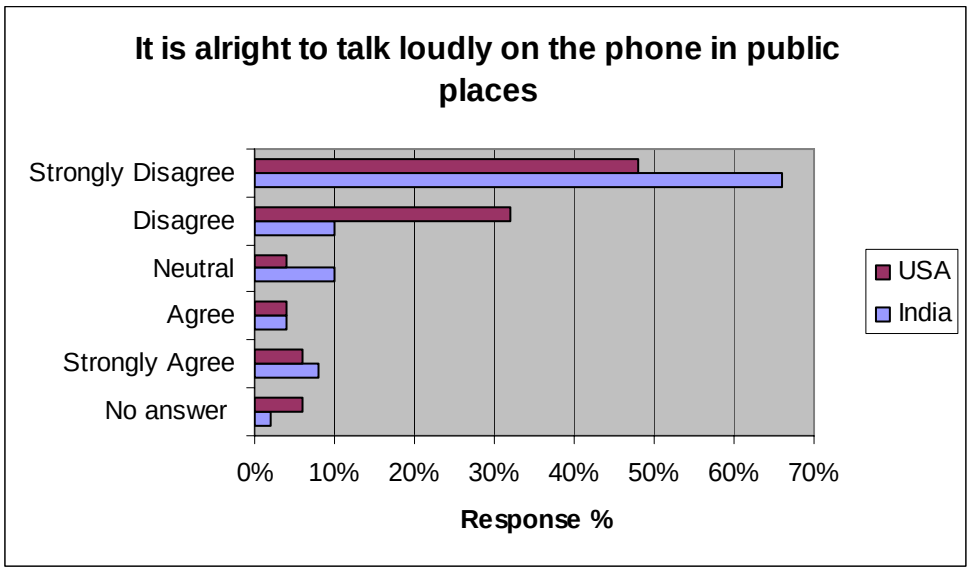


Figure 13: Only talking discreetly or quietly on phones in public places should be allowed



Sixty six percent of respondents from India and 44% of respondents from the United States strongly disagreed to the statement that it is alright to talk loudly on the phone in public places (see figure 14). 32% of US respondents and 10% of Indian respondents disagreed with the statement.

Figure 14: It is alright to talk loudly on the phone in public places

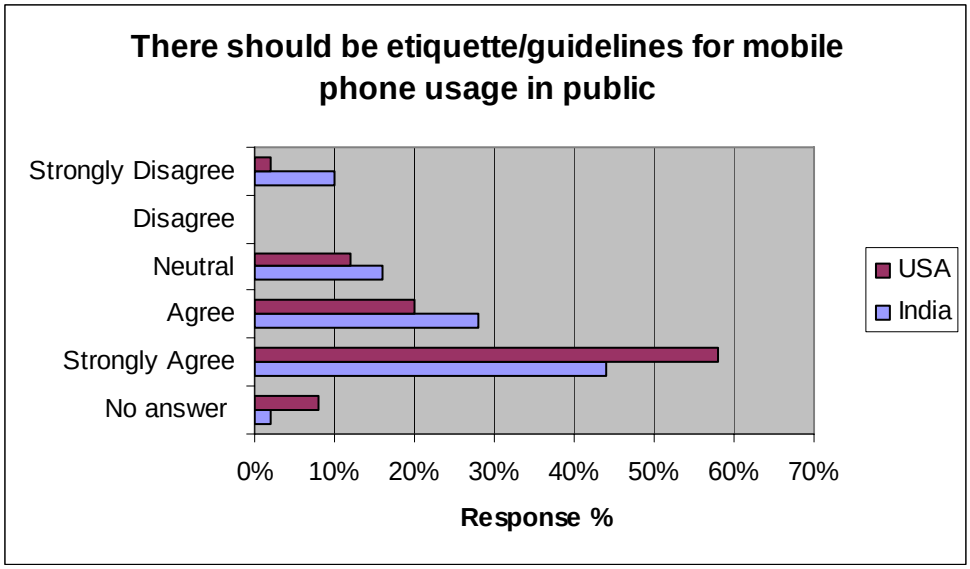


Fifty eight and 44% of the US and Indian respondents indicated strong agreement for having guidelines for mobile phone usage in public (refer to figure 15).

Respondents were also given an opportunity to state their own opinion and comments regarding using mobile phones on public places. 56 of the 59 comments received said that one can be quiet or discreet while using a phone; however, it is best avoided in places like a movie theater or a concert hall or a quiet restaurant. There were some unusual and interesting comments as well, one respondent said that the Japanese idea of having small rooms for cell phone users to go into to use the phone was appealing, the comment however did not elaborate further on the location and who actually builds these rooms. Another respondent commented that using a phone in a public place contradicts the

whole notion of privacy.

Figure 15: There should be etiquette/guidelines for mobile phone usage in public



Some of the general comments received regarding mobile phones talked about how quickly they have become common place in India and has made landlines obsolete. A respondent commented that mobile phones encourage the 'gift of the gab.' Another respondent raised the much discussed and unresolved issue of the health effects of mobile phones.

Discussion

The study collected demographic and general data apart from data related to usage, safety, and public and social perception. There are indications that there are several aspects of mobile phone usage which are similar in both countries. Staying in touch with friends / family is the highest ranked usage scenario in both countries. Palen, Salzman, and Youngs (2000), while studying new users of mobile phones found that the social use of mobile phones especially with friends and family increases over time. Another similarity across countries is that most respondents indicated that they own their own phones and when it comes to sharing phones, most respondents do not share their phones. Only a few respondents said that they share it with close family members, this is consistent with similar findings on phone borrowing by Castells, Mireia, Qiu and Sey (2004). The usage scenarios and sharing data both seem to show that phones are used to communicate and share with friends and family. A large percentage of respondents from both countries said that their mobile phones were their primary phones. This may point towards mobile phones being used by university students as either their first phone or to replace existing landline phones.

Most respondents across both the countries expressed satisfaction with their mobile service providers. The experience with mobile phones was

consistent across both the countries, more than 80% of the respondents from both countries have more than 12 months of experience using mobile phones. Evening is the most common time for using mobile phones in both United States and India. Around 70% and 60% of the respondents from India and the United States, said that they keep their phones in mute or vibration mode while in class or at a movie or a concert. There was general agreement between respondents from both countries that talking on the phone in public should not be banned. At the same time both agreed that only talking discreetly and quietly should be allowed. At the same time talking loudly on the phone in public is not seen positively by either students in either countries (the aggregate of disagree and strongly disagree is 76% for India and the United States respectively) this is similar to the findings of Palen, Salzman, and Youngs (2000). This indicates that talking on the phone in public is socially acceptable amongst university students as long as it is not loud and disturbing to others. This is also evinced in the strong support in favor of etiquette/guidelines for mobile phone usage in public.

However, there are a few areas in which there are substantial differences. The use of text messaging is more prevalent among the Indian respondents with 64% of them reporting using it multiple times a day compared to the corresponding 12% of US participants. Issac, Nikerson and Tarasewich (2004) found differences while studying French and American mobile phone users and

attribute it to the relative newness of text messaging in United States.

The survey also reported that a large number of Indian respondents keep their phones always turned on. In addition, no respondent from India indicated that he/she would turn off a phone while in a movie or concert. It may indicate that the participants from India want to be always available to communicate. It is also interesting to note that even though communicating with family and friends was the highest ranked reason for acquiring a phone, a large number of Indian respondents specifically chose keeping in touch with parents as a reason. Some of these differences can be attributed to the fact that most of the undergraduate level participants were Indian. In the author's opinion, undergraduate students are more dependent on parents, family, and friends than graduate students.

When respondents were asked about their mobile phone usage while driving, there was marked difference in opinion. More US respondents indicated that they sometimes use the phone or talk on the phone than respondents from India. Moreover 32% of respondents from India indicated they never use a phone while driving compared to 10% of US respondents. Issac, Nikerson and Tarasewich (2004) reported similar results when they studied mobile phone users in France and the United States.

Limitations of study

The shortcoming of this study is that there is a potential for a sampling

bias due to the convenience sampling method. All except one of the respondents from the United States were graduate students. The sample populations were not representative. There may be some bias also due to responses being limited to subjects with access to the Internet. This is mitigated by the fact that the entire sample population has some Internet access in their universities. The study does not take into account the bias introduced by external factors like local legal regulations, for example, using a mobile phone while driving is illegal in India and many parts of the United States. The questionnaire has elicited responses regarding driving and phone usage but not whether respondents actually own or drive a vehicle. The sample population of students from the United States comprising of graduate students usually own or drive an automobile. The sample population of students from India, having a large number of undergraduate students, are unlikely to have an automobile or drive often.

Some of the usage scenarios listed are dependent on the services available and/or subscribed from the local mobile phone service provider. These services may not be available in all regions and countries surveyed. Some of the scenarios describe services which may not be available in all mobile phones.

The reliability of this study and questionnaire is difficult to judge since the context, usage and adoption of mobile phones are rapidly changing. So the same set of questions may result in different answers if it administered in some other

context. Nonetheless, the results of the usage scenarios, text messaging, and mobile phone usage while driving are consistent with previous studies. There is a chance that participants in the survey may not be fully honest in answering the questions and their responses may not be representative of their actual behavior.

Conclusion

Mobile phones are increasingly one of the most popular information access devices. They have an extensive and continuing effect on how people communicate among themselves and how people conduct their day to day lives. This study gives an insight into the similarities and the differences in the usage of mobile phones across two very different countries. There were marked similarities with the usage of phones to communicate with others and there were similarities in the perception of mobile phone usage in public settings. Many participants felt the need for etiquette or guidelines for mobile phone usage in public settings. Overall these results suggest that the similar patterns were result of the mobile phones being used as a basic voice-based communication device. The differences which were observed all used additional features in the phones or were a result of the phones being used in different environments (like in a car or theatre). Thus, the use of text messaging and the opinion regarding driving and mobile phone use were found to be different.

This exploratory research may be useful as a preliminary background for others to extend and study further. Suggested future research could be scale the study to a larger more representative sampling across the two countries. This serve as a basis for similar comparative studies between the mobile phone oriented digital lifestyle based countries (Japan and South Korea), traditional

developed countries (United States and some countries in Western Europe), and the rapidly growing countries (India, China and Brazil).

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Appendix A

Mobile Phone Usage Survey

Survey

0: Please state the location of your university

Please choose **only one** of the following:

- ☐ India
- ☐ United States
- ☐ Other

1: Please state your gender

Please choose **only one** of the following:

- ☐ Female
- ☐ Male

2: Please state your age in years

Please write your answer here:

3: Please state your educational level

Please choose **only one** of the following:

- ☐ Currently in bachelors or undergraduate degree program
- ☐ Currently in masters or PhD degree program
- ☐ Other

4: Do you use a mobile phone?

If you have answered 'No' please proceed directly to Q18.

Please choose **only one** of the following:

- ☐ Yes
- ☐ No (please proceed directly to Q18)

5: Please state the ownership status of your mobile phone

Please choose **only one** of the following:

- ☐ I rent my mobile phone from the service provider
- ☐ I own my mobile phone
- ☐ Other

6: Do you share your mobile phone?

Please choose **only one** of the following:

- ☐ I do not share my mobile phone with anyone.
- ☐ I share my mobile phone. (Please state relationship below)

Make a comment on your choice here:

7A: Why did you acquire or start using a mobile phone? Rank one or more items that apply.

Please number each box in order of preference from 1 to 9

To use in case of emergency or personal safety

Everyone I know had one

To keep in touch with friends and other social contacts

To keep in touch with parents

For business reasons

For information access (phone numbers, internet, email, sports scores, etc)

It offers good value

Privacy management (I use it to stay in touch with close friends and/or family; others call me on my landline)

Other. Please specify below

7B: If you chose 'Other' as one of your responses to Q7A. Please elaborate below.

Please write your answer here:

7C: If you chose 'privacy management' as one of your responses to Q7A. Please mark all that apply and/or comment below.

Please choose all that apply and provide a comment:

- ☐ I use my mobile phone to stay in touch with my family

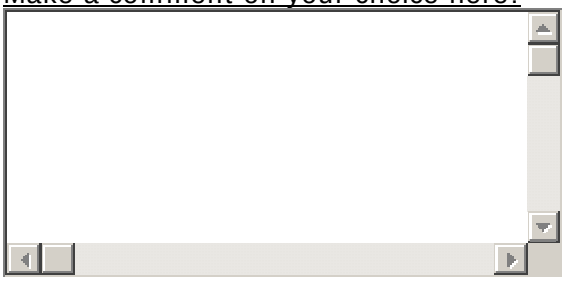
- ☐ I use my mobile phone to stay in touch with my friends
- ☐ I direct some people to call my mobile phone
- ☐ Other. (Please specify)

8: How long have you been using a mobile phone?

Please choose **only one** of the following:

- ☐ Less than 1 month
- ☐ More than 1 month but less than 3 months
- ☐ More than 3 months but less than 6 months
- ☐ More than 6 months but less than 1 year
- ☐ More than 1 year (specify years in comment area)

Make a comment on your choice here:



9: How often do you use text messaging or SMS service?

Please choose **only one** of the following:

- ☐ Never
- ☐ Rarely or once every few weeks
- ☐ 1 to 5 times a week
- ☐ Once a day
- ☐ Multiple times a day

10: What are your common mobile phone usage scenarios? Select and rank one or more items

Please number each box in order of preference from 1 to 16

staying in touch with friends

staying in touch with family

discuss schoolwork

office-related work (if working)

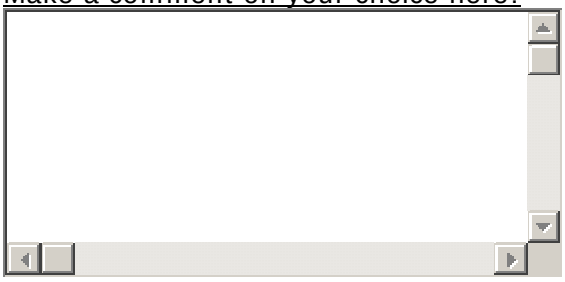
retrieve sports scores and news
check email
web-browsing
listen to music or radio
watch video
calendaring and appointments
clock and alarm
participate in contests
purchase tickets (movies, concerts, sports, etc)
banking
shopping or mobile commerce or paying bills
Other

11: Does your current service plan affect your usage? Please use the comment area to elaborate your answer.

Please choose **only one** of the following:

- ☐ Yes
- ☐ No

Make a comment on your choice here:



12: When is your mobile phone likely to be in mute or vibration mode? Mark one or more scenarios as appropriate.

Please choose **all** that apply:

- ☐ my phone is never in mute or vibration mode
- ☐ while in class
- ☐ while at work
- ☐ at a movie or a concert
- ☐ while driving
- ☐ while sleeping
- ☐ other (specify in comment area)

Other:

13: When is your mobile phone turned off? Mark one or more scenarios as appropriate.

Please choose **all** that apply:

- ☐ my phone is never switched off
- ☐ while in class
- ☐ while at work
- ☐ at a movie or a concert
- ☐ while driving
- ☐ while sleeping
- ☐ other (specify in comment area)

Other: _____

14: What time of day do you usually use your mobile phone?

Please choose all that apply and provide a comment:

- ☐ Morning _____
- ☐ Afternoon _____
- ☐ Evening _____
- ☐ Late night _____

15: Is your mobile phone your primary phone?

Please choose **only one** of the following:

- ☐ Yes
- ☐ No
- ☐ Other _____

16: Are you happy with your service provider?

Please choose **only one** of the following:

- ☐ Yes
- ☐ No
- ☐ Don't know / Other

Make a comment on your choice here:

_____

17: Mobile phones and driving. Please respond according to your typical usage scenario.

	Always	Sometimes	Never	Not Applicable
Do you use the mobile phone while driving?	☐	☐	☐	☐
Do you make and receive calls while driving?	☐	☐	☐	☐
Do you feel safe while driving and using a mobile phone?	☐	☐	☐	☐

Please choose the appropriate response for each item:

18: To what extent do you agree with the following comments (1=Strongly Agree, 5=Strongly Disagree)

Please choose the appropriate response for each item:

Talking on the phone while driving is dangerous and should be banned by law.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Talking on the phone and driving at the same is alright.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

19: Please state your opinion and/or experiences about using mobile phones while driving.

Please write your answer here:

20: Did someone using a mobile phone ever annoy you? Please explain your choice in the comments area.

Please choose **only one** of the following:

☐ Yes

☐ No

☐ Not applicable

Make a comment on your choice here:

21: Please rate your opinion of talking on mobile phones in public places

such as museums, movie theaters or restaurants: (1=Strongly Agree, 5=Strongly Disagree)

Please choose the appropriate response for each item:

Talking on phones in public places should be banned by law.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Only talking discreetly or quietly on phones in public places should be allowed.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
It is alright to talk loudly on the phone in public places.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
There should be an etiquette/guideline for mobile phone usage in public.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

22: Please state your opinion and/or experiences about using mobile phones in public places.

Please write your answer here:

23: Is there anything else you would like to share with me about mobile phones?

Please write your answer here:

Submit Your Survey.

Thank you for completing this survey.

Appendix B

Subject: Request to participate in student research survey on mobile phone usage.

Hello student,

I am a Master of Science in Information Science student at the School of Information & Library Science at the University of North Carolina at Chapel Hill. I would like to invite you to participate in a survey to collect data for my master's paper to investigate the motivation
and usage patterns of mobile phones among university students in India and United States. The survey questionnaire only requires 10 minutes of your time, and can be done online through the Internet. The survey is completely voluntary.

The survey is anonymous and no information that might personally identify you will be collected during the survey.

The following link will take you to the consent and information page of the survey. You may refuse to join, or you may withdraw your consent to be in study at any time.

http://www.unc.edu/~sayanc/mobile_phone_survey/

Please feel free to contact me if you have any queries.

Thanks,

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