# "I JUST SWITCHED" - WHO IS SWITCHING FROM A LANDLINE PHONE HOUSEHOLD TO CELL PHONE-ONLY HOUSEHOLD? 

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#### Abstract

In recent years, there has been an increase in the proportion of U.S. households that use cell phones exclusively or extensively. This trend presents a challenge to consumer research panels such as The Gallup Panel that use random digit dialing (RDD) methodology to contact U.S. households at random by landline phone in order to represent the entire U.S. population with their research. Included in this trend is a growing percentage of Americans who are considering giving up their landline phone access at home and planning to use cell phones exclusively. In this article, we use data collected from The Gallup Panel to present various demographic and psychographic characteristics of Americans who have switched or are planning to change their primary phone line from a landline to a cell phone. The article concludes with recommendations for future research avenues.


Keywords: Cell phone-only households, Panel surveys.

## 1. INTRODUCTION

Over the past few years, the number of Americans with landline telephones has declined sharply. About one in eight households did not have a landline telephone in the first half of 2006, according to data the Centers for Disease Control collected in its National Health Interview Survey. Three years earlier it was about one in twenty. In a recent report from MediaMark Research Incorporated (MRI), the percentage of Americans in cell phone-only households now exceeds the percentage of people living in landline-only households. The MRI data show that $84.5 \%$ of people now

[^0]have landline phones in their households, while $86.2 \%$ now have at least one cell phone. The report states that this milestone is a consequence of two trends - a steepening decline since the year 2000 in the percentage of households with any landline phone, accompanied by a rapid rise in the number of households with at least one cell phone. Other studies such as Brick et al. (2006), Callegaro et al. (2007), and Kim and Lepkowski (2002) have also noted the growing trend toward being cell phoneonly households. Clearly, we are seeing a change in consumer sentiment among more and more Americans who think of their phone as something mobile, without a fixed location.

This cell phone-only trend introduces challenges not previously experienced for phone surveys, which could have ramifications on policy and market research. Studies have recognized the cell
phone-only segment of the population cannot be reached by most pollsters because cell phone numbers are not included in these groups' telephone sampling frames for political polls (Lavrakas (2004); Steeh (2004)). Much of the current studies in the survey research field have acknowledged use of cell phone-only samples specifically (Steeh et al., 2007) or as supplements to RDD of land lines in order to improve estimates overall (Tucker and Meekins (2007); Blumberg and Luke (2006)). These studies and few others (PEW (2006); Keeter (2006)) have consistently demonstrated a "cell phone-only" member profile that tends toward being younger, less affluent, less likely to be married or to own their home, and more liberal on many political questions. Given the current penetration rates of cell phone-only as well as the decline in landline penetration nationwide, it seems reasonable to assume that the cell phone-only members described in these earlier studies are now becoming more heterogeneous as a new group of former landline-only or landline and cell phone owners who switch from a landline phone to a cell phone, or have "cut the cord". Understanding the profile of these individuals adds to the literature in meaningful ways. First, measuring and documenting such heterogeneity will provide further justification for cell phone supplements to RDD sampling. Second, the documented heterogeneity will provide insights into the need for more sophisticated ${ }^{2}$ weighting adjustments for those surveys that utilize only RDD of landlines. Furthermore, it may provide additional insights into possible stratification or data collection methods within the cell phone-only frame. The current study is one small effort in that direction.

In this article, we examine the demographic composition of a group of members in The Gallup Panel who reported disconnecting or cancelling their landline phone and are now cell phone-only. Specifically, we examine this group's demographic composition, and explore some of these members' intrinsic behaviors related to cell phone usage, such as taking a phone call from a number they do not recognize. Consumer RDD panels such as The Gallup Panel have a unique edge over Internet opt-in panels in identifying and studying these people because the panel members recruited for the group had a confirmed landline phone at the time they were asked to join (i.e., they were recruited to the panel by a call to their landline phone). In the sections that follow, we briefly describe the survey that asked panel members about their household's various phone services. The survey was conducted in two distinct phases. In the first phase, the survey was sent to active

[^1]adult (ages 18 and above) Gallup Panel members assigned to receive Mail or Web surveys. In the second phase, a follow-up Web survey was sent to members who indicated in the phase one survey that they only use a cell phone for their household communication needs. In addition to the validation piece, the follow-up survey also asked questions about a variety of topics relating to their cell phone use. We briefly describe the follow-up survey and then examine the results from both surveys. Finally, we discuss the findings from both studies and conclude with recommendations for future research avenues.

## 2. PREVIOUS RESEARCH

In recent years, only few studies have studied the shift from wireline to wireless phone service in households, but mostly from a consumer-centric, marketing, social and business perspective. For instance, Zimmeramn (2006) investigates the strategies of wireless carriers (e.g. Cingular and AT\&T) to mitigate the extent of consumers' wireline to wireless substitution. Wei and Lo (2006) investigates the role of cell phone on social connectedness. Along the same lines, Geser (2004) investigates the impact of cell phones on the social relationships and social system. Irina (2007) looks into the switch from landline to being a cell phoneonly household as a result of residential mobility. On a different note, Aoki and Downes (2002) describes cell phone usage among the young population from a psychological perspective. Nemeth (2001) describes a possibility of the evolution of mobile commerce given the shift from landline to mobile phone usage. Becker (2004) indicates the advantages for marketing using a mobile channel. Clearly, a gap exists in the survey research literature in terms of exploring the switch from landline to cell phone-only in a panel study, considering various demographic and psychographic viewpoints. This study will attempt to fill some of this gap.

## 3. PHASE ONE STUDY

### 3.1 Survey Design

The data for the phase one study, which asked panel members about their household's various phone services, were collected in a survey conducted by The Gallup Panel ${ }^{3}$ in the summer of

[^2]2007. The survey was entitled "Education Survey," and was sent to a random sample of 60,694 active adult (ages 18 and above) Gallup Panel members assigned to receive Mail or Web surveys. Table 1 shows the distribution of the total number of responses received across both Mail and Web versions of the survey.

Table 1. Total number of responses received across Mail and Web survey versions

| Survey Versions | $n$ assigned | $n$ completed | $\%$ |
| :--- | :--- | :--- | :--- |
| Mail survey | 31,872 | 21,220 | 66.57 |
| Web survey | 28,822 | 21,836 | 75.76 |
| Total | 60,694 | 43,056 | 70.93 |

The purpose of the phase one survey was to explore panel members' attitudes, opinions, and beliefs about several pressing issues about primary, secondary, and postsecondary education. In the last section of this survey, panel members were asked questions ${ }^{4}$ about their household's different phone services, including one that asked whether they or someone in their household have disconnected or cancelled the landline phone in the past 12 months. Figure 1 shows a illustrated view of this particular question.

Fig. 1. Illustration of question on different phone services in the household

Please indicate whether or not you currently have any of the following phone services in your household.


The multiple-selection nature of this question enabled panel members to report more than one type of phone service (i.e., landline phone, cell phone, and broadband phone) in their household. As a result, the data from this question could lead to 8 possible ${ }^{5}$ ways of answering this question. Table 7 in page 7 shows these different ways of
either through the mail or online (in addition to telephone surveys).
4 Please refer to the Appendix section for the actual questions asked in the survey.
5 Note that we are not considering a "No" response in combination with missing mainly for classification reasons. For instance, a "No" response to landline service and missing values for cell phone and broadband is deemed as a unclassifiable response. In other words, we only considered responses which have either a "Yes" or "No" response for all three phone services. As mentioned later in the
answering this question. In the table, " Y " indicates a "Yes" response and "N" indicates a "No" response to this question. For example, the third row in the table represents those panel members who gave a "NYN" response to this question, indicating that they only have a cell phone service in their household. These members were later sent a follow-up survey to confirm their selection and also answered questions about a variety of topics relating to their cell phone use.

### 3.2 Results from the phase one study

Figure 2 shows the distribution of responses received to the household phone services question. As it is evident from the figure, while $92.4 \%$ of panel members report having a landline phone service in their household, $87.8 \%$ report having a cellular phone service in their household. What also stands out in this analysis is the growing use of broadband phones. Nearly two out of ten panel members reported that they use broadband phone service in their household. Of particular interest for us in this study was the group of members who reported they only have a cell phone service in their household. For this, we analyzed the above top-line percentages further to compute weighted proportions of members who reported having one or more phone services in their household. The results of the analysis ${ }^{6}$ are shown in Table 2.

Fig. 2. Incidence of landline, cell phone, and broadband phone services in household


From Table 2, we can see that the incidence ${ }^{7}$ of landline-only, cell phone-only, and broadband-

[^3]Table 2. Distribution of responses received to household phone services question

| Response pattern |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| L | C | B | weighted $\%$ | un-weighted <br> $n$ |
| Y | Y | Y | $12.5 \%$ | 5,307 |
| Y | N | N | $13.6 \%$ | 5,424 |
| N | Y | N | $\mathbf{4 . 3 \%}$ | $\mathbf{9 1 1}$ |
| N | N | Y | $0.3 \%$ | 101 |
| Y | Y | N | $65.1 \%$ | 29,370 |
| Y | N | Y | $0.8 \%$ | 309 |
| N | Y | Y | $3.5 \%$ | 1,278 |
| N | N | N | $0.3 \%$ | 55 |
| Note: |  | L: Landline; C: Cell phone; B: Broadband; Y: "Yes"; N: "No" |  |  |

only among members who were initially recruited to the panel by a call to their landline phone is $13.6 \%, 4.3 \%$, and $0.3 \%$ respectively. Note that each row in this table represents a mutuallyexclusive group of response pattern.
The numbers in Table 2 are also presented in an illustration, as shown in Figure 3. Looking at this figure, we noticed that the cell phone-only group identified in the panel could be a result of migration of members from any or combinations of landline associated groups (i.e., segments A, $B$, and $D$ in the illustration), the reason being the members of the cell phone-only group had a landline (either in conjunction with or without other phone services) sometime back when they were recruited to the panel. Just like the saying goes "birds of same feather flock together", we wondered if new members (i.e., those who became cell phone-only in the past few months) in the cell phone-only group are similar to those who have been cell phone-only for some time in terms of their demographic characteristics. Also, how about those who are in the cusp of migration to the cell phone-only group? How are they different from other groups? To answer some of these questions, we examined the demographic composition across four distinct and mutually exclusive groups.
(1) Veteran group: Members of this group are currently cell phone-only and have disconnected their landline phone prior to the past 12 months.
(2) Newbie group: Members of this group are currently Cell phone-only and have discon-

[^4]nected their landline phone in the past 12 months.
(3) Very-Likely group: Members of this group have both cell phone and landline phone and are very likely to disconnect their landline phone in the next 12 months.
(4) Somewhat-Likely group: Members of this group have both cell phone and landline phone and are somewhat likely likely to disconnect their landline phone in the next 12 months.

The results of this analysis are shown in Table 3. This table shows the demographic characteristics of panel members (ages 18 and above) analyzed across all four groups. Results indicate that there was a significant difference in members' age across groups $(\mathrm{F}(3,5736)=243.06 . p<.0001)$, even after a logarithmic variance stabilizing transformation was applied to ensure the assumption of homoscedasticity was satisfied. The average age of members in Veterans, Newbie, Very-likely, and Somewhat-likely groups is $32,37,43$ and 45 years respectively. Notice that the average age of members increased as one moved along the four groups from Veteran to Somewhat-likely group. For instance, on average, the Veterans were at least 5 years younger than the Newbies and about 10 and 13 years younger than the Very-likely and Somewhat-likely groups. Of note, the estimated average age of Veterans (32 years) is a slightly larger estimate ${ }^{8}$ compared to previous reports focusing on demographics of people in cell phoneonly households (For e.g., Blumberg and Luke (2006)).

All other demographic characteristics were highly associated ( $p$-values all $<0.001$ ) with membership to these groups, except for gender. In the Veteran group, there were fewer high school graduates $(16.9 \%)$ and more "some college" ( $32.7 \%$ ) members than expected. Interestingly, a sizable proportion of members in Veterans and Newbie groups are not-married ( $75.3 \%$ and $60.4 \%$ ), are more renters than homeowners ( $28.6 \%$ and $39.9 \%$ ), and have income under $\$ 25,000$ ( $13.2 \%$ and $16.8 \%$ ) compared to the other two groups, supporting the findings from other cell phone-only studies (such as PEW (2006) and Keeter (2006)), and what also appears as a general consensus about this group that is cell phone-only members are less affluent and less likely to be married or to own their home.

[^5]
## 4. PHASE TWO STUDY

The data for the second phase/follow-up study were collected in a Web survey conducted by The Gallup Panel in the fall of 2007. The survey was entitled "Telephone Services Survey," and was sent to 655 panel members out of the 911 total number of cell phone-only members identified from the first phase of the study. The reason why not all 911 panel members were assigned to the follow-up study had to do with inactive status of some panel members, while for others the email address information was either missing or invalid. The purpose of the follow-up survey was to confirm their cell phone-only selection in the first study and also to obtain members' attitudes, opinions, and beliefs about several topics relating to their cell phone use. The follow-up survey received a total of 359 responses at a net response rate ${ }^{9}$ of $55 \%$.

### 4.1 Results from the follow-up study

In addition to the screener question (i.e., the question asked for validating/confirming members' cell phone-only status), we analyzed two more questions ${ }^{10}$ out of the total 13 questions that were asked in the follow-up study. Table 4 shows the distribution of responses received for the screener question. As we can see from this table, a large

Table 4. Distribution of responses received for the screener question

| Response choice | un- <br> weighted <br> $n$ | $\%$ |
| :--- | :--- | :--- |
| All calls on cell phone - no <br> landline or broadband phone | 265 | $73.8 \%$ |
| All calls either on cell phone or <br> broadband phone - no landline <br> phone | 17 | $4.7 \%$ |
| All calls either on cell phone or <br> broadband phone - have land- <br> line for non-calling needs | 12 | $3.3 \%$ |
| All calls either on cell phone or <br> landline phone | 64 | $17.8 \%$ |
| All calls on landline phone | 1 | $0.2 \%$ |
| Total | 359 | $100 \%$ |

[^6]proportion ( $73.8 \%$ ) of panel members reported that they make all calls on their cell phone and have neither landline nor broadband phone service in their household. The overall confirmation rate ${ }^{11}$ for cell phone-only is $81.8 \%$, which indicates the proportion of members who are cell phone-only, with or without a broadband phone or landline phone that is used only for non-calling purposes (for example, for use with fax machines, modems or computers). Note that the survey data from the follow-up study was not weighted, and hence the percentages shown in this section are un-weighted proportions. After identifying this twice-confirmed cell phone-only group, we conducted subsequent analysis only for this group.
Among the many challenges polling organizations face in surveying a potential cell phone-only respondent, behaviors of cell phone owners relating to receiving and initiating phone calls that could affect survey response rate requires some consideration. In this study, we consider two specific cell phone usage behaviors. First, respondent's inclination to answer an incoming call from a un-recognized number without regard to the balance of his/her cell phone minutes. Second, respondent's inclination to return a voice mail immediately on their cell phone during peak/any time/day time hours without regard to his/her cell phone minutes. Two questions in the follow-up survey were asked to gather data on these two cell phone usage behaviors. First, we conducted a simple analysis involving a cross tabulation across sex and age. The results are given in Table 5. Overall, $40.6 \%$ of panel members mentioned that they would answer a call from a un-recognized number, while a higher proportion ( $73.6 \%$ ) mentioned that they would return the call immediately. However, the differences in proportions across sex and age for both behaviors were not significant.

Following this, we conducted separate binary logistic regression analysis to determine which of the demographic variables successfully predict the two cell phone behaviors. The analysis was conducted twice, one for each cell phone behavior. In Model 1, the dependent variable is inclination to answer an incoming call from a un-recognized number without regard to the balance of one's cell phone minutes. The dependent variable was coded 1 for answering the un-recognized call and 0 for not answering the un-recognized call. In Model 2, the dependent variable is inclination to return $a$ voice mail immediately on their cell phone during peak/any time/day time hours without regard for the balance of one's cell phone minutes. This dependent variable was coded 1 for returning a voice mail and 0 for not returning the un-recognized

[^7]call. Table 6 shows the results of the analysis for both models.

While Model 1 was found to be not-significant, independent variables Education, Employment, and Age in Model 2 significantly predict ( $\chi^{2}(10)$ $=26.80, \mathrm{~N}=203, p<.01$ ) inclination to return voice mail immediately on their cell phone during peak/any time/day time hours. As can be seen from this table, the odds of returning a voice mail immediately on their cell phone for those a) with low education is 2.6 times higher than those with high education (i.e., college degree and above) and b) who are employed full time is $3.3(1 / 0.3)$ times lower than for those who are employed part time. The odds ratio for Age is 0.95 , suggesting that the odds of returning a voice mail immediately on the cell phone decreases by $5 \%$ with each year increase in age of the respondent. For example, a person of 40 years will have $50 \%$ lower odds of returning a voice mail immediately than a person of 30 years old.

## 5. DISCUSSION AND CONCLUSION

The interpretation of these results is, of course, limited by the fact that this is a exploratory study, and that we only investigated a few aspects of cell phone usage behavior. While most of the demographic characteristics across Veterans, Newbie, Very-likely and Somewhat-likely groups were significant, a more detailed examination involving multivariate analysis is necessary to arrive at more substantive conclusions about these groups. This study serves as a foundation on which future such studies will be built. However, within these limitations, numerous interesting insights nonetheless appeared.
As expected and in line with what studies that have used nationally representative cell phone samples have found, the Veterans and Newbie groups whose members are currently cell phoneonly, were found to be more "mobile". In other words, they are less likely to be married or to own their home and are less affluent. Another interesting finding is the increasing trend in the average age of members starting from the Veteran to Somewhat-likely group. What this means is that given our current perception of the cell phoneonly group as being very homogenous ${ }^{12}$, there appears to be some evidence that this group is or has been becoming more heterogenous with more diversity in demographic characteristics. As previously noted, measuring and documenting such heterogeneity will provide further justification for

[^8]cell phone supplements to RDD sampling and may provide additional insights into possible stratification or data collection methods within the cell phone only frame.
Lastly, our investigation into the possible drivers of cell phone usage behaviors revealed that the inclination to return a voice mail immediately on their cell phone without regard to the cell phone minutes balance is higher among those who have low education and lower among those who are employed full time. Furthermore, the odds of returning a voice mail immediately on the cell phone decreases by $5 \%$ with each year increase in age of the respondent. While the small sample size in this analysis makes it difficult to make more definitive conclusions, nonetheless the analysis highlights the importance of cell phone usage behaviors in our effort to understand cell phone-only group better than ever before.

## 6. APPENDIX

### 6.1 Questions asked in the phase one study

Q1. Please indicate whether or not you currently have any of the following phone services in your household.

- Residential/landline phone service
- Cellular or mobile phone service
- Broadband phone service (Internet phones using the Internet instead of regular phone lines to transmit calls)
Q2. In the past 12 months, did you or anyone in your household disconnect or cancel your residential/landline telephone line(s)?
- Yes
- No

Q3. In the next 12 months, how likely is it that your household will disconnect or cancel your residential phone service and instead use a cellular or broadband phone for your calling needs?

- Not likely at all
- Not very likely
- Somewhat likely
- Very likely
- Don't know
- Does not apply


### 6.2 Questions asked in the phase two study

Q1. If an incoming call registers on your cellular phone ID from a number you do not recognize are you likely to...

- answer it without regard to your account minute balance
- answer it if you have anytime/peak/daytime/whenever minutes to spare
- let the call go to voice mail
- ignore it altogether.

Q2. If you received a voice mail on your cellular phone during peak/anytime/daytime hours and wanted to return the call, would you...

- return the call immediately, regardless of the cost to your anytime/whenever/daytime/peak minutes
- wait to return the call during off-peak hours
- use a landline phone to return the call
- this choice would depend on other reasons

Q3. In total, how many cellular phones, including PDA phone and SmartPhone, do you currently own or use?

- one
- two
- three
- four
- five or more


### 6.3 Additional tables and figures

Table 7. Possible ways of answering the household phone services question

| Description | L | C | B |
| :--- | :---: | :---: | :---: |
| 1. Have all three types | Y | Y | Y |
| 2. Landline only | Y | N | N |
| 3. Cell phone only | N | Y | N |
| 4. Broadband only | N | N | Y |
| 5. Landline and cell phone | Y | Y | N |
| 6. Landline and broadband | Y | N | Y |
| 7. Cell phone and broadband | N | Y | Y |
| 8. Don't have all three types | N | N | N |

Note: L: Landline; C: Cell phone; B: Broadband; Y: "Yes"; N: "No"

## REFERENCES

Aoki, K. and E. Downes (2002). Cell phone usage:
An analysis of users' subjective responses in the adoption. IEEE.
Becker, M. (2004). Effectivenss of mobile channel additions and a conceptual model detaining the interaction of influential variables.
Blumberg, S.J. and J.V. Luke (2006). Wireless subsitution: Early release of estimates based on data from the national health interview survey, july - december 2006.

Fig. 3. Illustration of various phone services in household


Brick, M. J., S. Dipko, S. Presser, C. Tucker and Y. Yuan (2006). Nonresponse bias in a dual frame sample of cell and landline numbers. Public Opinion Quarterly.
Callegaro, M., C. Steeh, T. Buskirk, V. Vehovar, V. Kuusela and L. Piekarski (2007). Fitting disposition codes to mobile phone surveys: experiences from studies in finland, slovenia and the usa. Journal of Royal Statistical Society.
Geser, H. (2004). Toward a sociological theory of mobile phone. University of Zurich.
Irina, A. S. (2007). Residential Mobility, Technology and Social Ties. PhD thesis. Carnegie Mellon University.
Keeter, S. (2006). The impact of cell phone noncoverage bias on polling in the 2004 presidential election. Public Opinion Quarterly.
Kim, S.W. and J.M. Lepkowski (2002). Telephone household non coverage and mobile telephones. American Association of Public Opinion Research. St Pete Beach.
Lavrakas, P.J. (2004). Will a perfect storm of cellular-linked forces sink rdd. American Association of Public Opinion Research. Phoenix, AZ.
Nemeth, G. (2001). Next generation consumer direct: The evolution of mobile commerce. Institute for the future/Peppers and Rodgers Group.
PEW (2006). The cell phone challenge to survey research. Technical report. The PEW Research Center.
Steeh, C. G. (2004). A new era for telephone surveys. American Association of Public Opinion Research. Phoenix, AZ.
Steeh, C. G., T. Buskirk and M. Callegaro (2007). Using text messages in u.s. mobile phone surveys. Field Methods 19, 59-75.
Tucker, C.J., Brick M.J. and B. Meekins (2007). Household telephone service and usage patterns in the united states in 2004: Implica-
tions for telephone samples. Public Opinion Quarterly 71, 3-22.
Wei, R. and V. Lo (2006). Staying connected while on the move: cell phone use and social connectedness. New Media and Society.
Zimmeramn, P. (2006). The cingular and at\&t merger, wireline-affliated wireless carriers, and intermodal competition in telecommunications. FCC 04-225, Federal Communications Commission.

Table 3. Percent of members, by groups and demographic characteristics

| Demographic Characteristics | Veteran ( $\mathrm{n}=386$ ) | Newbie ( $\mathrm{n}=511$ ) | Very-likely ( $\mathrm{n}=1,153$ ) | Somewhat-likely ( $\mathrm{n}=3,106$ ) Analysis |
| :---: | :---: | :---: | :---: | :---: |
|  | \% | \% | \% | \% $\chi^{2}$ |
| Gender |  |  |  | $\chi^{2}(3)=4.71$ |
| Male | 50.6 | 46.5 | 50.8 | 48.8 |
| Female | 49.4 | 53.5 | 49.2 | 51.2 |
| Age |  |  |  | $\chi^{2}(18)=832.97^{* * *}$ |
| 18-24 | 42.4 | 20.2 | 9.7 | 10.5 |
| 25-34 | 32.2 | 32.1 | 26.9 | 19.9 |
| 35-44 | 9.1 | 19.1 | 25.0 | 21.7 |
| 45-54 | 7.1 | 17.2 | 17.3 | 20.5 |
| 55-64 | 3.6 | 6.8 | 10.5 | 12.9 |
| 65-74 | 3.4 | 3.1 | 7.4 | 10.3 |
| 75+ | 2.2 | 1.5 | 3.2 | 4.3 |
| Race |  |  |  | $\chi^{2}(15)=65.43^{* * *}$ |
| White only | 80.6 | 80.0 | 85.7 | 85.4 |
| Black only | 11.9 | 11.6 | 9.9 | 8.7 |
| Ethnicity |  |  |  | $\chi^{2}(3)=32.34^{* * *}$ |
| Hispanic | 5.6 | 11.6 | 9.1 | 12.0 |
| Education |  |  |  | $\chi^{2}(12)=140.14^{* * *}$ |
| Less than HS | 7.2 | 6.9 | 6.9 | 7.5 |
| HS graduate | 16.9 | 29.4 | 26.5 | 32.1 |
| Some college | 32.7 | 27.5 | 26.7 | 20.5 |
| Associate's Degree | 3.1 | 7.1 | 7.1 | 6.5 |
| College grad+ | 40.1 | 29.1 | 32.7 | 33.4 |
| Marital status |  |  |  | $\chi^{2}(3)=538.84^{* * *}$ |
| Married | 24.7 | 39.6 | 64.1 | 63.7 |
| Not-married | 75.3 | 60.4 | 35.9 | 36.3 |
| Home ownership |  |  |  | $\chi^{2}(3)=147.66^{* * *}$ |
| Own | 71.4 | 60.1 | 81.8 | 81.4 |
| Rent | 28.6 | 39.9 | 18.2 | 18.6 |
| Income |  |  |  | $\chi^{2}(12)=120.53^{* * *}$ |
| Under \$25,000 | 13.2 | 16.8 | 7.1 | 7.9 |
| \$25,000 to \$34,999 | 10.8 | 13.6 | 10.0 | 10.5 |
| \$35,000 to \$49,999 | 15.7 | 19.0 | 23.3 | 18.7 |
| \$50,000 to \$74,999 | 24.6 | 22.0 | 19.7 | 25.2 |
| \$75,000+ | 35.8 | 28.6 | 39.9 | 37.6 |
| Census regions |  |  |  | $\chi^{2}(9)=57.52^{* * *}$ |
| Northeast | 15.4 | 10.4 | 17.6 | 16.7 |
| Midwest | 24.3 | 30.9 | 21.2 | 23.9 |
| South | 38.1 | 31.4 | 37.0 | 37.4 |
| West | 22.2 | 27.3 | 24.2 | 22.0 |

Table 5. Cell phone usage behavior, by Sex and Age

| Behavior | Total (\%) | Sex |  | Age Group |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Male (\%) | Female (\%) | $\begin{aligned} & 18 \text { to } 34 \\ & (\%) \end{aligned}$ | $\begin{aligned} & 35 \text { to } 54 \\ & (\%) \end{aligned}$ |
| A. Answer the call without regard to account minute balance | 40.6 | 43.5 | 37.4 | 34.5 | 44.5 |
| B. Return the call immediately, regardless of the cost to anytime/whenever/daytime/peak minutes | 73.6 | 75.5 | 71.6 | 78.8 | 70.3 |
| ( $n$ ) | (293) | (151) | (142) | (115) | (178) |

[^9]Table 6. Odds ratios for the effects of demographic characteristics on the probability of answering cell phone behavior questions

|  | Model $1^{a}$ |  | Model $2^{\text {b }}$ |  |
| :---: | :---: | :---: | :---: | :---: |
|  | $\beta$ | Odd's ratio | $\beta$ | Odd's ratio |
| Low Education <br> $($ Less than college $=1)$ | 0.03 | 1.03 | 0.96 | 2.61* |
| High Income <br> $(\$ 75,000$ and above $=1)$ | 0.03 | 1.03 | 0.21 | 1.23 |
| Marital Status <br> $($ Married $=1)$ | 0.00 | 1.00 | -0.39 | 0.67 |
| Employment <br> (Full-time $=1$ ) | -0.43 | 0.64 | -1.18 | $0.30^{* *}$ |
| Residential Mobility <br> (Same residence $5+$ years $=1$ ) | -0.28 | 0.75 | 0.13 | 1.13 |
| Residence Type $(\text { Rent }=1)$ | -0.90 | 0.40* | -0.71 | 0.49 |
| Age | 0.00 | 0.99 | -0.05 | 0.95* |
| Gender <br> (Female $=1$ ) | -0.27 | 0.75 | -0.60 | 0.54 |
| Own multiple cell phones <br> (More than one cell phone $=1$ ) | 0.05 | 1.05 | -0.28 | 0.75 |
| Number of cell phone calling minutes included in the plan | 0.00 | 1.0 | 0.00 | 1.00 |
| Model 1: $n=205 \chi^{2}(10)=10.32$ <br> Model 2: $n=203 \chi^{2}(10)=26.80^{* *}$ |  |  |  |  |
| Note: ${ }^{*} p<.05 ;{ }^{* *} p<.01 ;{ }^{* * *} p<.001 ;$ (two-tailed) |  |  |  |  |
| ${ }^{a}$ The dependent variable is inclination to answer an incoming call from a un-recognized number without regard to the balance of one's cell phone minutes. |  |  |  |  |
| ${ }^{b}$ The dependent variable is inclination to return a voice mail immediately on their cell phone during peak/any time/day time hours without regard to the balance of one's cell phone minutes. |  |  |  |  |


[^0]:    1 Kumar Rao is a graduate of Survey Research and Methodology program in University of Nebraska-Lincoln and currently works for The Gallup Panel, Gallup Organization. Email: kumar_rao@gallup.com

[^1]:    2 Such as dual frame sampling techniques for sampling landlines and cell phone-only.

[^2]:    3 The Gallup Panel is one of the nation's few research panels that are representative of the entire U.S. population. The Gallup Panel selects households using random digit dialing (RDD) methodology. Panel members are randomly recruited by telephone and, depending on their level of usage of the Internet, are assigned to receive surveys

[^3]:    results section, the proportion of unclassifiable responses was found to be very small.
    ${ }^{6}$ We excluded a total of $301(0.7 \%)$ cases from the analysis, 20 cases were unclassifiable and 281 cases were missing. Because of this, the total of all responses in this table is 42,755 .
    7 The sample for the phase one study was weighted to represent the United States adult population. The survey data was subjected to a post-stratification process to adjust for variable non-response and non-coverage. Demographic distributions such as gender, age, education, race, and region from the most recent Current Population Survey (CPS) are used as benchmarks in this adjustment. The final weights compensate for non-response and non-coverage to create

[^4]:    unbiased, nationally representative estimates. Note that unless explicitly mentioned, all percentages mentioned in phase one study results are weighted.

[^5]:    8 In their report, Blumberg and Luke (2006) mention that the average age of adults in cell phone-only households is 30 years. If we assume that the adults in their study are Veterans or long-time cell-only group members, then our estimate is higher than what they have found using a nationally representative cell phone-only sample.

[^6]:    9 The reason the response rate for the follow-up survey was less than the first study ( $54.80 \%$ vs. $75.76 \%$ ) has to do with the duration of survey field period. The follow-up survey had a survey field period of a week, whereas for the first study the field period was three weeks.
    ${ }^{10}$ Please refer to the Appendix section for the actual questions.

[^7]:    ${ }^{11}$ The total of the first three rows in Table 4 (i.e., 294 cases).

[^8]:    ${ }^{12}$ Referring to the profile of this group that tends toward being younger, less affluent, less likely to be married or to own their home, and more liberal on many political questions.

[^9]:    Note: The above analysis included only those who were confirmed cell phone-only, with or without a broadband phone or landline phone that is used for non-calling purposes; One case was removed for missing values.

