My Cell Phone's Ringing, "Caller Unknown," Now What? Usage Behavior Patterns Among Recent Landline Cord Cutters Who Have Become Cell Phone-Only Users

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ABSTRACT

A growing number of Americans are considering cutting their landline telephone cords in favor of becoming cell phone-only. To date, survey researchers have begun to understand that cell phone-only users tend to be "heavy users" of cell phones compared with those who have both landlines and cell phones. Recent studies on cell phones (either in conjunction with/without a landline phone) have explored behaviors such as types of plans (individual/family), type of usage (sharing,/personal) and frequency of usage (most/some calls, emergency calls). With increases in the number of cell phone subscribers coupled with decreases in landline ownership, could variability in cell phone usage patterns be explained in part by recent changes in telephone status?

While cell phone plan attributes (e.g., number of any-time/whenever/nights-and-weekend minutes and web and text messaging access) and phone attributes/ capabilities (e.g., smart/PDA phone, external caller id screen) vary by provider, these may also influence patterns of use – a relationship that has received little attention in the literature. The understanding of prevalence and use of these attributes, which in practical ways differ in function and use from their landline counterparts, is crucial to optimizing call designs to cell phone users.

In this paper, we use data collected from a two-phase Gallup Panel survey to explore cell phone usage patterns of members who reported being cell phone-only. The participants in this study were originally recruited via RDD landline samples and their self reported change to cell phone-only status was confirmed from a follow-up Web survey that collected specific cell phone plan data including: type, cost, minutes and technological components such as: voice mail and text messaging. A detailed analysis of usage behaviors including explorations of the interaction between cell phone plan/ phone capabilities and answering propensity will be presented.

1 INTRODUCTION

The number of cell phone subscribers in the U.S. continues to rise and the impact of cell phone-only households in particular has received greater attention in the recent literature (see Keeter et al. 2007, Ehlen and Ehlen, 2007 and Blumberg and Luke, 2007, for example). In particular, survey researchers employing standard RDD landline surveys are now recognizing the need to supplement these samples with cell phone RDD samples that are based on either dual frame survey designs or supplemental survey designs that screen for cell phone-only status (see AAPOR Task Force Report, 2008 and Lavrakas et al. 2007). One of the most interesting issues regarding cell phone samples to date deals with weighting cell phone respondent data based on some user characteristics including number of cell phones used (Brick et al. 2007) as well as considering differential response propensities for the cell phone-only samples that are based on "heavy users of cell phones" (Steeh 2004) where "heavy" could refer to number of minutes a subscriber spends on the cell phone per month. In particular, interest in the ownership (i.e. individual versus shared) and usage patterns of cell phones has seen some discussion in current literature as related to implications for telephone samples and the need for different weighting and propensity for receiving calls on cell phones (Tucker, Brick and Meekins, 2007). Usage patterns and ownership based on slightly more recent national survey data have also been reported by Tuckel and O'Neill (2005) with particular interest in describing how cell phone subscribers use their phone and their willingness to be contacted on their cell phone for survey research purposes. This study also inquired about the use of CALLER ID capabilities of the cell phones as related to screening inbound calls. Additional interest in the literature has been given to using technological components of cell phones themselves including text messaging capabilities for surveying or alerting respondents about possible inclusion in a survey sample of cell phone subscribers (Steeh et al. 2007 and Brick et al. 2007 and Brick Edwards and Lee, 2007) prior to calls made to potential participants. The differences in cell phone and landline usage patterns and other technological aspects regarding cell phone use and function (i.e. dropped calls, operator messages for failed call attempts, busy or non-working cell phone numbers) in survey research have prompted reconsideration of AAPOR disposition codes for processing interim call statuses for cell phone samples which could also serve as the basis for data collection necessary for properly weighting cell phone-only samples (Callegaro, Steeh, and Buskirk et al. 2007). While much of the current literature has focused on specific tech-

nical aspects of weighting, surveying and coding cell phone samples as well as on possible data quality issues resulting from cell phone surveys as compared to landline counterparts (see Yuan et al. 2005, Brick et al. 2007 and Steeh 2004/8) much less attention has been paid in the survey research literature regarding the possible relationships between cell phone plan architecture (e.g. number of minutes, price per month), attributes (i.e. family plan, rollover minutes, voice mail, internet access, texting capabilities, etc..) and technology (e.g. smartphone, touchscreens, speakerphone, caller ID, ringtone capabilities, etc.) and usage patterns/behavior.

In this paper we will explore specific usage patterns and behaviors of cell phone-only users that are a part of the ongoing Gallup Panel via Internet/Web surveys. Initially, all Gallup Panel members are selected and recruited via an RDD landline sample and are assigned to either mail or Web contact for subsequent surveys throughout their tenure in the panel. The initial assignment to either Web or mail modes of contact is based primarily on internet connectivity of households and the frequency of internet use with heavier internet users (at least twice per week) being assigned Web contact. Thus, the cell phone-only users in this study were initially either landline only or both landline and may have higher levels of internet connectivity and use when compared to the general population. Of specific interest for this study is how Gallup panel Cell Phone-Only users (GPCPO) make use of various plan features such as text messaging, email, internet etc. and how these features may vary by type and cost of plan. Finally, interest is given in to understanding possible relationships between demographics, phone features and plan usage as it relates to answer and call return propensity. Information gleaned from this study will likely influence additional modes or methods of contact via cell phones (i.e. text messages, internet surveys via phone, etc.) for future panelists who become cell phone-only.

2 STUDY POPULATION/RESPONSE RATE

The main emphasis of this study was to determine usage patterns of Gallup Panel members who reported being cell phone-only in the "Education Panel Survey (EPS)" administered between June and July, 2007. The survey was distributed to a random sample of active adult (ages 18 and above) panel members. While the survey was sent to panelists assigned to receive either a paper version or Web version, this study focuses on members of the Web portion of the Gallup Panel who specified in the EPS that they were cell phone-only (with neither landline nor internet based phones). Since its inception, the Gallup Panel's initial RDD recruitment (i.e., respondents who agree to join the panel) has a response rate of approximately 27%. Then, approximately 55% of those who agree to join the Gallup Panel ultimately return their welcome packet questionnaire (i.e., after a nonresponse follow-up) and are officially en-rolled in the panel. Histori-

cally, the cumulative panel recruitment response rate (factoring in all stages of response) has been approximately 15%. For the EPS Web-based portion of the panel, a total of 28,822 adults received the survey and a total of 21,766 completed it (75.5% panel survey cooperation rate). Of those that completed the EPS, 538 reported being strictly cell phone-only (as defined by having a cell phone and neither a landline nor any broadband based phone). Clearly the estimated cell only rate from this sample is considerably lower than in other published resources, but we track this to two sources: (1) strict definition of cell phone-only that excludes broadband phone ownership and (2) panel recruited landline owners who could have also owned cell phones at the time of recruitment. The GPCPO users from the Web-based portion of the panel differed from non-cell phone-only members in ways that were very similar to how cell phone-only users differ from the adult population (see Brick et al. 2007) – specifically, they tended to be single, less likely to own their own home, younger (i.e. less than 50 years of age), and stayed in the panel longer.

The 538 GPCPO users identified from the EPS were then sent a follow-up Web survey (described more in detail in the next section) about cell phone plans, attributes and usage via the internet. We remark here that these users have received all prior Gallup Panel surveys via the Internet/Web, so the mode of data collection for the Cell Phone Usage Follow-up Survey (CPUFUS) was consistent with prior mode for these panelists. The CPUFUS contained a total of 13 questions and was administered via the Internet with users receiving an active URL address via email during October of 2007. The survey link remained "live" for a total of 7 days and no follow-up emails or reminders were sent to panel members. Of the 538 surveyed, a total of 359 responded for an overall CPUFUS cooperation rate of 66.73%. Those who responded tended to be slightly younger than those who did not and also a higher proportion of respondents were male compared to nonrespondents.

3 QUESTIONNAIRE

To better understand how cell phone users process calls from unknown sources as well as use the technology and services available to them via their cell devices and plans we included various usage behavior and feature subscription questions. A screening questionnaire was included to verify cell phone-only status as previously reported in the EPS. Also included were questions relating to: the types of cellular phone features (10 total including: unlimited long distance, free incoming text messages, free outgoing text messages, etc.); the actual device and features of plan (i.e. use of MP3 player, browse internet, send/receive text messages, send/receive email, use of touch screen, etc.); types of plans (family, individual or corporate); number of users and phones, number of minutes and monthly price of plan. This information was intended to understand how future contact

with cell phone-only panelists could be achieved via their cell phone. We also posed two hypothetical call situation questions regarding an unknown number on the caller ID and a voice mail left during peak/whenever minutes hours to understand if plan attributes and other usage patterns/features could be related to the propensity to answer or return a call. The exact wording of the questions is included in the appendix.

4   METHODOLOGY/ANALYTIC PLAN

Due to the exploratory nature of some of the outcomes of interest, a Bonferroni adjustment for the type-I error rate will be used so that .0025 is regarded as the threshold for declaring statistical significance. Associations between categorical variables were assessed using Fischer's Exact Test. The general linear model was used to assess relationships between continuous outcomes such as plan costs and plan minutes and various covariates including type of plan, use of phone features, etc. Logistic regression models were used to predict the likelihood of returning a call upon receipt of a voicemail as well as the likelihood for answering a call from an unknown caller on the cell phone ID screen. In both of these analyses, demographic variables were entered in block one followed by phone usage/features variables in block 2. To explore relationships between plan features such as unlimited long distance, no roaming, etc., we employed a two-step cluster analysis using a log-likelihood distance measure with a range of clusters specified as 2 to 5. Similarly, relationships between the use of phone and plan features such as address book, text messaging and internet were explored using Hierarchical cluster analysis with both average linkage within groups and unweighted pair-group method using arithmetic averages along with the Jaccard similarity measure (i.e. similarity ratio). Of the 359 respondents to the CPUFUS, 65 individuals stated that they used both household landline and cell phone to make all their calls in the initial screening question included in the survey. Because interest in this study centered on the usage patterns among cell phone-only subscribers, these 65 respondents were excluded from our analyses. Finally, 17 respondents reported having corporate plans and were also excluded from the analyses that were intended to understand personal uses of cell phones and plan attributes. Thus, a total of 277 respondents were included in the analyses described throughout this manuscript. We note that the results of the EPS are weighted and include post-stratification adjustments for the entire U.S. non-institutionalized population. However, in this study we do not weight the cell phone usage data collected from the CPUFUS because our main emphasis is in understanding the basic prevalence of plan features and attributes among panelists who are cell only and in basic relationships between cell phone attribute prevalence and response propensity. By using the education survey weights that are further adjusted for non-response for the

CPUFUS from a relatively small number of cell phone-only users is likely to produce final weights that are highly variable and as such could result in artificially inflated standard errors making inference less precise. In the models employed we controlled for as many of the stratification variables known in the design as possible (some cells were not populated and hence could not be included in the model).

5   RESULTS

In this section we report usage patterns and answering behaviors based on the results obtained from questions 8 through 13 in the Appendix. The distribution of basic demographic variables including gender, age, race, income, home ownership and education as well as length of time in the panel is provided in Table 1.

5.1   Costs/Minutes/Types of Plans/Sharing

Cell phone-only respondents reported spending an average of $70.23 per month for their base cell phone plan which included an average of 935.77 peak/anytime/whenever minutes. The estimated cost per anytime/whenever/peak minute was estimated from a linear regression model to be approximately $.022 (95% CI: $.017 to $.027) and plan minutes explained approximately 25.4% of the variability observed in plan price. Roughly 40% of the respondents reported having an individual plan, 53% a family plan, 6% corporate rates/plans and the remaining one percent reported "not applicable" or "don't know". The type of plan (family or individual) and number of cell phones owned/used (one versus 2 or more) were significantly associated (Fisher's Exact Test p-value <.00001) – namely, 83% of those that had an individual plan reported having only one cell phone compared to 39% of those having a family plan. Base monthly plan costs and total number of minutes were also significantly different between family and individual plans. In particular, respondents with a family plan reported an average base monthly price of $83.07 for an average of 1057.51 peak/whenever minutes compared to an average of $53.04 for an average of 782.95 peak/whenever minutes, for respondents with individual plans (p-value for price <.00001; p-value for minutes <.005). Among respondents reporting family plans, a strong association was observed between the number of cell phones respondents reported owning/using and the number of people who shared the plan [Fisher's Exact test p-value<.0001]. In particular, people reporting owning more than one phone were most likely to report the same number of people sharing the plan as phones owned; 52% of those reporting owning one phone reported having two people sharing the plan. A summary of this association is provided in Table 2.

5.2   Plan Features

In order to understand the cell phone plan features that panel members have as part of their standard plan or have added on to their plan, we examined the results of the survey question (#8 in the Appendix) which asks panelists whether they have one of 10 features as a standard part of their plan, have added it on to their base plan or do not have the feature. In Table 2, descriptive statistics are provided for the proportion of respondents who have each of these features as either a standard part of their cell phone plan, add-on feature onto their plan, or don't have/not available for their plan. Most notably, a small percentage of respondents (6.7%) reported having a "pre-paid" plan. Moreover, text messaging capabilities were more likely an add-on feature with 46.3% of respondents stating they have added incoming text messaging capabilities as compared to 18.9% stating they have them as a standard feature. Outgoing text messaging capabilities followed a similar pattern as illustrated in Table 3. Also of note, wireless data transfer services (a.k.a. wireless internet browsing for some providers) were available for nearly half of the respondents.

As an exploratory and summary measure, we applied a two-step clustering algorithm using a log-likelihood criterion for the distance measure to form a maximum of five clusters of respondents based on whether they have, added-on, or did not have items 1, 2, 3, 4, 5, 6, and 9. Contractual agreements and pre-paid calling were excluded as clustering variables based on the fact that nearly all/none had this feature, respectively. "Roll-over minutes" feature seemed more provider specific, so this feature was also excluded. Based on the results of the clustering algorithm a total of three clusters of respondents emerged consisting of 37%, 18% and 45% of the respondents, respectively.

Cluster number 1 could be best characterized by cell phone-only respondents who are less likely to have: unlimited long-distance, free incoming or outgoing text messages, no-roaming charges, wireless data transfer features compared to the other clusters of respondents. Respondents in cluster 2 were more likely to have free incoming text messages as a standard part of their plan and free outgoing messages as either standard or added on to their plan compared to respondents in the other two clusters. Finally, respondents grouped into cluster 3 were more likely to have added on wireless data transfers, free outgoing and incoming text messaging features to their plan compared to respondents in either of the other two clusters. Distinctions of these clusters would be important in further contact with these respondents as the cost and use of added features may be different from those who have such features included in their cell phone plan. Cluster membership was slightly associated with access of internet via cell phone (14.7%, 36.2, 27% for clusters 1, 2, and 3, respectively, Fisher's Exact test p-value= .0109) although not statistically significant after applying the Bonferroni adjustment. Cluster membership was significantly associated with sending and receiving SMS with a greater proportion of respondents in Clusters 2 and 3

reporting regular use compared to those in Cluster 1 (79%, 65% and 39%, respectively; Fisher's Exact Test p-value <.00001) – this finding illustrates that use of text messaging that is consistent with their availability in the plan (e.g. profile of clusters 2 and 3 is primarily based on respondents reporting either standard or add-on text messaging capabilities). Similarly, Cluster membership was associated with regular use of Multimedia Messaging Services (MSM) with 17%, 51%, and 29% of respondents reporting regular use of MSM services from clusters 1, 2 and 3, respectively (Fischer's exact p-value <.00015). Interestingly, a higher proportion of respondents from cluster 2 rather than cluster 3 reported use of MSM even though cluster 3 respondents were more likely to add wireless data transfer features to their phone. However, some text messaging plans are suited for picture mail and other enhanced versions of messaging so further clarification on how Short Message Service (SMS) may differ from MSM may be needed if a finer distinction is to be made in usage patterns. In addition to the features that distinguished the clusters, significant differences in the total number of plan features was noted (F(2, 257)=187.457, p-value<.00001) with respondents in cluster 1 reporting an average of 4.67 features (either standard or added) as compared to an average of 7.60 and 7.67 features for respondents in clusters 2 and 3, respectively. No significant differences were observed between the clusters for the base monthly cost, nor in the number of minutes available in the plan (p-values .193 and .050, respectively.) We note here that base monthly costs do not include costs incurred by respondents for adding features to their plan.

5.3 Usage Patterns

In addition to cell phone plan features, we investigated the regular use of 21 cell phone and plan features including the use of speaker phone, contact/address book, touch-screens, GPS, internet, email and text messaging services. The percentage of respondents who reported regularly using each of these features is provided in Table 3. We note that a high concordance between availability of the feature (Table 3) and the use of the feature (Table 4) was reported for text messaging (of those reporting having text messaging features, 72.1% report regular use, – Fisher's Exact Test p-value <.00001). A similarly high concordance was found between internet browsing/email regular use and the wireless data transfer feature – of those reporting having this feature, nearly 65% reported regularly using internet, sending email or using other WI-FI connectivity (Fisher's exact test p-value <.00001). These usage patterns are consistent with the previous patterns we described in the previous section with the three clusters of respondents grouped in essence by availability of certain cell phone plan features.

As a final exploration of the regular use of cell phone and plan features we conducted two Hierarchical cluster analyses using the 21 features described in Question 10 in the

Appendix using the Jaccard proximity measure recommended for binary outcomes with both the average linkage within groups method and the unweighted pair group method using averages. Both methods resulted in similar results- namely, two clusters of highly proximal features emerged – the first consisted of regular use of phone features including address book, built-in speaker phone, and camera (proximity values >.6) as well as sending and receiving text messages and calendar/datebook (proximity values >.5). The second cluster of highly proximal features consisted of phone plan attributes including sending and receiving email and accessing internet (proximity values >.64), using multimedia messaging, additional connectivity (including WI-FI) and synchronization of contacts/email (proximity values >.37). Perhaps somewhat surprising was the rather low proximity value between sending/receiving email and sending/receiving text messages- .242 – and as a consequence, these services were not included in the same regular use cluster.

5.4 Answering Cell Phones: Answer Patterns

When asked "if an incoming call registers on your cell phone ID from a number you do not recognize", 41% of respondents specified that they were likely to answer the call without regard to their account minute balance, 4.5% were likely to answer if they had available "whenever" or "non-peak" minutes to answer, 44% were likely to let the call go to voicemail, and the remaining 10.4% were likely to ignore it altogether. Given that voicemail capabilities are nearly ubiquitous with cell phone plans in the U.S., we also inquired about the nature of voice mail use. Specifically, when asked "if you receive a voice mail during peak hours and wanted to return the call", 74.2% of respondents specified that they would return the call immediately, regardless of the cost to the anytime minute balance; 4.5% would wait to return the call during off-peak/unlimited calling hours and only 1.5% would return the call on a landline. The remaining 19.9% of respondents said the circumstances of the call rather than plan or balance of minutes would dictate call-back behavior. Of these, 10.5% stated that returning the voicemail would depend on account balance while nearly 58% stated that call back would depend on who was calling. The pattern to return a voicemail was slightly significantly associated with whether the cost of the plan exceeded $50.00 (approximately lower quartile of plan monthly cost) and marginally significantly associated when the cost of the plan exceeded $61.00 (median monthly cost of plans reported). In particular, of those reporting plans with monthly costs below $50.00, 63.7%, 7.7% and 28.6% reported that they would return the call immediately regardless of cost to minute bank, would return the call either on a landline or during off-peak hours or would return the call based on other factors, respectively compared to 80.6%, 4.7% and 14.7%, respectively whose monthly base plan costs ex-

ceeded $50.00 (Fisher's exact p-value=.0118). [Distributions for <$61.00 versus >=$61.00 were similar in order – overall Fisher's exact test p-value=.0214.]

The answer distributions for both caller id and voice mail return questions were not significantly associated with the actual dollar amount of the plan nor the reported number of whenever/anytime minutes (all p-values >.059). However, respondents reporting that they would be likely to answer an unknown call if they had anytime/whenever minutes to spare as well as those who said they would return a voice mail during off-peak hours reported the lowest number of anytime/whenever minutes on average compared to respondents in other answer categories for each of these questions, respectively. Total monthly cost of base plans were similar across answer options for the caller id question but for the voice mail question respondents stating they would wait to return the call reported lower monthly plan costs on average ($59.72) compared to respondents stating different return call preferences, although the difference was not statistically significant.

The propensity to answer an incoming call from an unknown number as well as to return a voice mail left during peak minutes hours could be a function of both personal and cell plan characteristics. In order to explore this conjecture, two hierarchical logistic regression model was fit with demographic characteristics included in block one and cell phone plan/features entered in block two. The outcomes of interest for the first model was whether the respondent was likely to answer a call from an unknown caller without regard to account balance (i.e. without qualifications) versus answering it if minutes were available, letting it go to voice mail or ignoring it altogether; the outcome for the second model was whether the respondent would return a voice mail immediately versus waiting to return the call on their cell phone, using a landline to return the call or returning the call contingent on other factors (i.e. who was the caller, etc.). The results of the first model are provided in Table 5. The likelihood ratio $\chi2=113.808$ for block 1 demographic variables for predicting answering a call from an unknown number appearing on the caller ID with a maximum rescaled $R2=.098$; the final model presented in Table 4 has a likelihood ratio $\chi2=26.959$ (p-value=.136) and a maximum rescaled $R2$ value of .184. While the overall model only explained less than 20% of the variation in answering cell phone call from unknown caller without qualifications, two features of the model are worth noting: those with children at home appear less likely to answer without qualifications compared to those without children at home (odds ratio: .383, p-value=.032). Likewise, those whose plan included less than 500 peak/whenever minutes were also less likely to answer the call without qualifications (odds ratio: .386, p-value=.020).

The results for the model predicting the likelihood of immediately returning a call after receiving a voice mail during

peak minutes hours is displayed in Table 6. The likelihood ratio χ2=26.008 for block 1 demographic variables for predicting return of call after voice mail with a maximum rescaled R2=.199; the final model presented in Table 5 has a likelihood ratio χ2=43.368 (p-value=.002) and a maximum rescaled R2 value of .310. From table 5 we see that significant predictors for returning the voice mail immediately included a personal/demographic characteristic as well as two cell phone usage characteristics. In particular, those who were employed full time were marginally significantly less likely to return the call immediately compared with those who were not employed full time (odds ratio: .375, p-value=.049). The odds for returning the call immediately increase by approximately 20% for every $10.00 increase in base monthly cost of plan (p-value=.036). Finally, those respondents who have at least some friends who use cell phones were approximately 20% as likely to return the call immediately compared to those respondents who have no friends with cell phones (odds ratio: .2015, p-value=.037).

6 DISCUSSION/CONCLUSION

Future research would be to expand the cell phone behavior survey to panelists who report having both a landline and a cell phone to better understand if cell phone-only users are in fact "heavier" users of minutes, features and services. We have seen that among panelists who reported cell only status a strong association between presence of a plan feature and regular use of the feature, especially for text messaging and internet/wireless data transfer usage. Moreover, a majority of panelists reported that these features were available on their cell phone plans. This information creates additional pathways for future communication with cell phone-only panelists besides the web surveys they are currently receiving. In particular, while text messaging limitations exist by federal law for unsolicited messages, it is possible to send such messages to consenting individuals. Clearly from this work we readily identified clusters of panelists who are regular users of texting and/or wireless data transfer/browsing features in their cell phones. Consenting these panelists by sending periodic text messages/emails via cell phone for reminding them to complete surveys for future contact could improve panel retention, reduce costs, and improve response. More research is needed to understand the proportion of cell only panelists who would consent to this type of contact. For consumer panels, which use RDD recruitment, understanding resources available to cell phone-only respondents such as texting and internet use via cell phone is important for providing these individuals cost effective solutions to complete panel surveys over their tenure in the panel. This work provides initial insights into cell phone-only panelists from one such ongoing panel recruited from RDD sampling of landline phones.

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8   APPENDIX

8.1   Follow-up Web Survey Questions

Q1. To help us classify your responses, please tell us which of the following applies to your household…

1. The members of your household make all of their phone calls using cellular/mobile phones because your household **does not** have a landline or broadband/IVoIP phone (are phones that use the Internet instead of regular land lines to transmit calls).

2. The members of your household make all of their phone calls using **either** cellular phones or broadband phone because your household **does not** have any landline phone.

3. The members of your household make all of their phone calls using cellular phones and/or broadband phones because your household's landline phones are **used only** for non-calling purposes (for example, for use with fax machines, modems or computers).

4. The members of your household make all of their phone calls using **either** cellular phones or your household's landline phone.

5. The members of your household make **all** of their phone calls using a landline phone because no one in your household has a cellular phone.

(If code 1 or 2 in #1, Skip to Q2; If code 3 in #1, skip to Q3; Otherwise, thank and terminate)

Q2. You indicated that your household does not have any landline telephones. What is the main reason you do not have landline telephone service in your household?

1. Cannot afford the service

2. Service is not available

3. Use cellular phone service instead

4. Use calling cards or pre-paid telephone cards in public phones instead

5. Other reason (specify) *(Allow 100 characters)*

Q3. Which of the following types of cellular phones do you or anyone in your household currently own?

(Mark all that applies)

1. **Cellular or mobile phone** (phone only or phone with select data features (e.g., messaging, camera, games, etc.)

2. **PDA phones/SmartPhone** (voice with advanced organizer/data functionality (e.g., Palm and Pocket PC based phones, Blackberry with phone, Apple Iphone, etc.))

3. **Other type** (specify) *(Allow 100 characters)*

Q4. In total, how many cellular phones, including PDA phone and SmartPhone, do you currently own or use?

1. One.

2. Two

3. Three

4. Four

5. Five or more

Q5. Keeping in mind the cellular phone that you use the most, do you use that mostly…

1. For personal purposes

2. For business purposes

3. For both personal and business purposes equally

Q6. Keeping in mind the cellular phone that you use the most, do you currently have a…

1. **Individual plan** (i.e., individual use of some pre-specified amount of minutes or pre-paid plan).

2. **Family plan** (i.e., pricing featuring pooled minutes shared among a group of people)

3. **Corporate plan/rates** (i.e., special rates or discounts through a company or organization affiliation)

4. **Don't know/Not applicable**

(If code 2 in #6, skip to Q7; Otherwise, skip to Q8)

Q7. You indicated that you have a family plan for your cellular phone service. How many people share this plan including yourself?

1. One.

2. Two

3. Three

4. Four

5.   Five or more

Q8. For each of the following features, indicate if they are a standard or add-on (i.e. something that you pay an extra fee) feature of your current cellular phone service plan?

A. Standard

B. Add-on

C. Don't have/Not applicable

1.   Free unlimited nights and weekends calling

2.   Unlimited long distance calling

3.   Free incoming text messages

4.   Free outgoing text messages

5.   Unlimited mobile-to-mobile calls (i.e., free calling between some or all mobile phones on the same network)

6.   No roaming charges (i.e., local calling rates regardless of U.S. location)

7.   Contractual agreement for some specified period of time.

8.   Roll-over minutes (i.e., unused minutes that are carried over to the next month)

9.   Wireless data transfer (emails, internet)

10.   Prepaid Calling

Q9. Not including unlimited calling, how many minutes are included with the price of your current cell phone's monthly calling plan?

(Allow 4 digits)

Q10. Other than using your cellular phone for making or receiving calls, please indicate whether or not you regularly use each of the following features on your cellular or mobile phones…

A.   Yes

B.   No

1.   Games (pre-existing on the device)

2.   Use phone to listen to music/MP3 player/FM radio

3.   Voice activated dialing

4.   Receive text alerts (e.g., sports, news, stocks)

5.   Send and receive SMS (Short text message) messages

6.   Send and receive email

7.   Calendar/Date book

8.   Address book (e.g., handset contains addresses, phone numbers, email addresses, etc.)

9.   Access the internet/browse web pages

10.   View and pay bills from phone

11.   Additional connectivity (Infrared port, USB port, Bluetooth, Wi-Fi)

12.   Camera capabilities

13.   Multimedia messaging service (e.g., personalized message, voice or email, with enhanced images and sound)

14.   International roaming capabilities

15.   Push-to-talk (2-way radio/walkie-talkie capabilities)

16.   Built-in speakerphone

17.   Downloadable programs (Java/Brew applications)

18.   Synchronize email, contacts, calendar

19.   Touch screen

20.   Location based service (GPS)

21.   Memory expansion (flash cards or SD cards)

Q11. What is the base monthly price of your current cellular phone service plan?

Please indicate your best whole dollar estimate (e.g., if your base monthly price is $29.95, enter 30)?

(Allow 3 digits)

Q12. If an incoming call registers on your cellular phone ID from a number you do not recognize are you likely to…

1.   answer it without regard to your account minute balance

2.   answer it if you have anytime/peak/daytime/whenever minutes to spare

3.   let the call go to voicemail

4.   ignore it altogether

Q13. If you received a voice mail on your cellular phone during peak/anytime/daytime hours and wanted to return the call, would you…

1.   return the call immediately, regardless of the cost to your anytime/whenever/daytime/peak minutes.

2.   Wait to return the call during off-peak hours

3.   Use a landline phone to return the call

4.   This choice would depend on… (specify) (Allow 100 characters)

Table 1: Distributions of Demographic Variables for the 277 Cell phone-only respondents included in the analyses.

Demographic Variables	%/Mean	SE
Males	51.09%	0.0301
Income < 50 K	34.35%	0.0294
Married	44.04%	0.0299
Homeowner	62.95%	0.0323
18-34 Years Old	39.70%	0.0294
35-49 Years Old	32.90%	0.0282
50-64 Years Old	24.90%	0.026
65+ Years Old	2.50%	0.0094
Northeast Region	11.90%	0.0195
Midwest Region	34.30%	0.0285
Southern Region	32.90%	0.0282
Western Region	20.90%	0.0244
College Degree or More	65.34%	0.0286
Employed Full Time	64.98%	0.0287
Children <18 @ Home	22.87%	0.0282
Race is White	90.04%	0.0182
Years in Panel	1.69	0.0471

Table 2: Reported number of Phones Owned/Used by Total number of People Reported to Share Plan for 153 Family Plan Respondents

		How many people share this (family) plan including yourself?				
		One	**Two**	**Three**	**Four**	**Five or more**
	One	3.40%	52.50%	27.10%	5.10%	11.90%
In total, how many cellular phones, do you currently own or use?	**Two**	7.40%	69.10%	20.60%	1.50%	1.50%
	Three		26.70%	66.70%	6.70%	
	Four		16.70%	16.70%	66.70%	
	Five or more			20.00%		80.00%

Table 3: Percentages of respondents having various cell phone plan features (n=277)

Cell Phone Plan Features	Standard Feature on my Plan	Added Feature to my Plan	Don't have-Not applicable
Free unlimited nights and weekends calling	90.10%	6.30%	3.70%
Unlimited long distance calling	78.40%	7.80%	13.80%
Free incoming text messages	18.90%	46.30%	34.80%
Free outgoing text messages	10.70%	51.10%	38.10%
Unlimited mobile-to-mobile calls (i.e., free calling between some or all mobile phones on the same network)	80.40%	6.30%	13.30%
No roaming charges (i.e., local calling rates regardless of U.S. location)	69.90%	12.60%	17.50%
Contractual agreement for some specified period of time.	91.20%	0.40%	8.50%
Roll-over minutes (i.e., unused minutes that are carried over to the next month)	27.00%	3.30%	69.60%
Wireless data transfer (e-mails, Internet)	9.70%	39.80%	50.60%
Prepaid Calling	4.10%	2.60%	93.20%

Table 4: Percentage of respondents reporting regular use of various cell phone/plan features (n=277)

REGULAR USE of Cell Phone Features	%Yes
Games (pre-existing on the device)	26.84
Use phone to listen to music/MP3 player/FM radio	12.22
Voice activated dialing	22.43
Receive text alerts (e.g., sports, news, stocks)	15.75
Send and receive SMS (Short text message) messages	58.46
Send and receive e-mail	19.49
Calendar/Date book	43.91
Address book (e.g., handset contains addresses, phone numbers, e-mail address)	71.79
Access the Internet/browse Web pages	24.81
View and pay bills from phone	12.55
Additional connectivity (Infrared port, USB port, Bluetooth, Wi-Fi)	28.94
Camera capabilities	69.23
Multimedia messaging service (e.g., personalized message, voice or e-mail, with enhanced images and sound)	29.67
International roaming capabilities	10.26
Push-to-talk (2-way radio/walkie-talkie capabilities)	1.1
Built-in speakerphone	68.5
Downloadable programs (Java/Brew applications)	14.07
Synchronize e-mail, contacts, calendar	17.65
Touch screen	8.09
Location based service (GPS)	8.82
Memory expansion (flash cards or SD cards)	15.87

*unweighted percentages

Table 5: Logistic Regression model to predict answering a call from an unrecognized number on cell phone caller ID (n=183).

	B	S.E.	Sig.	95.0% C.I.for EXP(B) Lower	Upper
Age	-.024	.016	.117	.946	1.006
Male	.466	.349	.182	.804	3.161
Married	.443	.403	.272	.706	3.435
Homeowner	.702	.447	.117	.840	4.844
Children<18 @ home	-.960	.447	.032	.160	.919
White	-.767	.664	.248	.126	1.707
At residence < 2yrs	-.192	.413	.641	.367	1.853
Income < 50K	-.096	.409	.814	.408	2.023
Region (West, Reference)			.460		
Northeast	-.995	.693	.151	.095	1.437
Midwest	-.092	.486	.849	.351	2.365
South	.032	.517	.951	.375	2.844
CollegeDegree	-.072	.373	.846	.448	1.932
EmployedFullTime	-.635	.370	.086	.257	1.094
Cell Plan Monthly Cost	.002	.006	.776	.990	1.014
Peak Minutes < 500	-.951	.409	.020	.173	.862
SmartPhone (PDA phone)	-.290	.464	.531	.301	1.856
Cut Landline Past 12 months	.398	.390	.307	.694	3.196
At least some friends w/cell phones	-.770	.471	.102	.184	1.165
FamilyPlan	-.678	.417	.104	.224	1.150
Regularly Use Cell Phone Address Book	.499	.386	.196	.772	3.513
Constant	1.742	1.396	.212		

Table 6: Logistic regression model for predicting Call Return after receiving a voice mail (n=181).

	B	S.E.	Sig.	95.0% C.I.for EXP(B) Lower	Upper
Age	-.038	.019	.050	.927	1.000
Male	.507	.427	.235	.719	3.838
Married	-.880	.476	.064	.163	1.054
Homeowner	.764	.526	.146	.766	6.014
Children<18 @ home	.905	.601	.132	.762	8.027
White	1.038	.788	.187	.603	13.230
At residence < 2yrs	.332	.504	.510	.519	3.741
Income < 50K	.031	.501	.950	.387	2.753
Region (West, Reference)			.438		
Northeast	.932	.914	.308	.423	15.230
Midwest	-.393	.604	.515	.207	2.202
South	-.423	.647	.513	.184	2.328
CollegeDegree	-.545	.496	.272	.220	1.533
EmployedFullTime	-.980	.497	.049	.142	.994
Peak Minutes < 500	-.362	.484	.455	.270	1.798
Cell Plan Monthly Cost	.019	.009	.036	1.001	1.038
At least some friends w/ Cell Phones	-1.602	.766	.037	.045	.905
Cut Landline past 12 Months	.491	.471	.297	.649	4.109
FamilyPlan	-.345	.490	.480	.271	1.848
Number of Cell Plan Features	.152	.106	.152	.945	1.433
Regularly Use Cell Phone Address Book	.160	.461	.730	.475	2.897
Constant	1.512	2.039	.458		