We Can Hear Where You Are: Evaluating Interviewer Intuitions about Whether Cell Phone Respondents Are at Home or Away from Home

Becky Reimer[1], Dan Malato[1], Christopher Ward[2], Jennifer Kelly[2], Trevor Tompson[1], Jennifer Benz[1]
[1]Associated Press-NORC Center for Public Affairs Research
[2]NORC at the University of Chicago

Abstract

As the proportion of U.S. households that are reachable only or mainly by cell telephone continues to rise over time, it is increasingly important for telephone surveys to include cell telephone samples. Cell phone interviewing presents unique challenges to researchers. Recent research (Ward, et al., 2013; Lavrakas, et al., 2010) suggests that a substantial percentage (more than 25 percent) of cell phone respondents who complete interviews do so while in locations away from home, and that these respondents may be less inclined to provide information on certain types of questions. It stands to reason that, in addition to responding differently during the interview, respondents who are away from home may also behave differently during the screening process and have different cooperation rates than those who are at home. Investigating this research question is potentially challenging given that many cell phone call attempts end quickly and asking every respondent for his/her location on every call is not feasible. Using data collected by the AP-NORC Center, this research examines whether interviewers can use respondent and situational cues to estimate respondent location. For all cell phone call attempts where human contact occurred, interviewers were trained to assess whether the respondent was at home or away from home. On longer calls, interviewers also asked respondents directly about their location, which allowed for the comparison of interviewer perceptions and respondent reports about location. We examine the accuracy of interviewer estimates as well as differences in interview completion for respondents believed to be at home versus away from home on the first call where contact was made. We discuss implications for callback strategies and refusal aversion techniques based on these differences.

Keywords: cell telephone, landline, CATI, interviewer, location, home, away, evaluation

Background

Cell telephone samples have become an integral complement to landline samples in computer-assisted telephone interviewing (CATI) over the past several years (Curtin, et al., 2005). The proportion of cell phone only users in the general population grows at a steady clip – at about 2-3% per year over past decade, and a recent estimate suggests that 54% of the U.S. adult population is reachable only by cellphone (Blumberg & Luke, 2013) – and excluding these respondents from samples risks not only undercoverage bias but also nonresponse error . In response to this increasing proportion of cell users in the population, the inclusion of a cell telephone frame in national CATI surveys extends coverage to cell-only users and is expected to reduce potential noncoverage bias in estimates (Keeter et al., 2007).

The benefits of cell telephone interviewing are not, however, without tradeoffs. Complementing a landline frame with one of cell phones poses several additional challenges to the field of survey research. In contrast to landline respondents, cell telephone respondents are often more difficult to contact, are more difficult for interviewers to engage, and are typically much more expensive to interview (Link et al., 2007). Furthermore, these operational challenges often pose greater costs to the design of surveys with cell telephone samples, as they tend to require more call attempts to complete an interview, additional costs for refusal aversion training, and additional lines of sample to compensate for low response rates (CDC, 2013). Indeed, survey researchers are faced with the mounting costs of cell interviewing in contrast to the benefits of minimizing nonresponse and undercoverage.

In many circumstances, there are additional burdens for cell telephone respondents who are away from home when contacted by a survey research organization. For example, respondents who answer the phone in public may have greater privacy concerns than those at home or on a landline telephone. Likewise, the common distractions arising from multitasking may increase the cognitive burden imposed on respondents (Hyman, et al., 2010). Previous research suggests that at least part of the increased challenge of interviewing cell telephone respondents lies in attempting to contact and interview them while they are away from home (Ward et al., 2013). Further compounding to these challenges is the possibility that a cell telephone respondent's location may affect the data quality, which has been addressed briefly in the literature (Lavrakas, et al., 2010; Ward, et al. 2014).

In light of the challenges inherent in interviewing cell respondents who are away from home, the present study attempted to identify one method of mitigating the effects of cell respondent location. In particular, this research investigated the extent to which interviewers correctly ascertain respondent location during the course of the interview. From these findings, we make recommendations for ways in which researchers may use interviewer ascertainment of respondent location in survey operations.

Research Data and Methods

The broader goal of this line of research (although beyond the scope of the present study) is to determine if interview completion rates and/or data quality could be improved for cell respondents who are away from home by training interviewers to interact with these

respondents in a specifically tailored way. If cell respondents who are away from home behave differently than those who are at home, the ability to swiftly determine respondents' locations during phone contacts and intervene quickly could improve outcomes with these types of cell respondents. With this goal in mind, our first consideration in the current research was finding a suitable way to determine whether respondents are at home or away from home. One method would be to ask them directly during the screening process, but this approach has two challenges. First, some respondents might end the call before interviewers were even able to ask this question. Second, it might be off-putting to some respondents to be asked about location very early in a phone call, and this might lead to increased breakoffs.

Instead, as our first research question, we chose to explore whether interviewers could accurately guess cell respondents' locations without directly asking. We compared interviewer guesses with self-reported location from respondents to measure their accuracy. This analysis was done at the interviewer level.

Our second research question was how much call outcomes would differ between respondents who were guessed to be at home versus respondents who were guessed to be away from home. This investigation was at the sample line level rather than interviewer level. We were interested to see if there were differences between these groups in terms of interview completion.

To analyze these questions, we used data from the Personal News Cycle study, which was conducted by the AP-NORC Center for Public Affairs Research with funding from the American Press Institute. This was a study of how Americans consume news across various topics and platforms, completed between January 9, 2014 and February 16, 2014. It included a total of 1,750 completed interviews with adults ages 18 and older. This study included several oversamples, including Hispanics (N=358), non-Hispanic African Americans (N=318), and Chicago residents (N=265). Of the 1,750 completed interviews, 1,158 were conducted on landline telephones and 592 were conducted on cell phones. The analysis focused on the telephone contacts with cell phone respondents. There were a total of 7,642 cell telephone calls that involved human contact.

Cell respondents' locations were assessed in the following ways. For any cell phone call that was a breakoff (meaning a call that did not result in a full interview completion), we inserted a silent question for the interviewer to answer on screen after the respondent had been disconnected from the line. This question read: "What is your best guess about the respondent's location when the call ended?" The response option choices were "home" and "away from home". This was a forced choice, meaning that the interviewer had to choose one of these two options to proceed, and there was no option for "unsure / don't know". Interviewers were trained to make educated guesses about the location using cues such as background noise or any relevant comments made by respondents.

For any cell phone call that resulted in a completed interview, we included two questions in the demographic section of the questionnaire, which was located near the end of the interview. The demographics section included a silent question for the interviewer that was similar to the version used for breakoffs, which read: "What is your best guess about the respondent's location right now?" Again, this was not read out loud to the respondent, and it was a forced choice question with response options of "home" versus "away from home". Interviewers were trained to make guesses for this question in the

same way as they were for the breakoff question. Directly after this silent question, there was a question read out loud to the respondent, asking "Would you mind telling me if I reached you today at home or away from home?" This question also had response options of "home" and "away from home," and respondents were allowed to volunteer a response of "don't know" or "refused".

Analysis

To assess interviewer accuracy, we analyzed only the 592 completed cell phone interviews. This was the group of calls where interviewers were asked to guess the respondent location and respondents were asked about their location. To determine accuracy, we compared interviewer guesses to answers respondents gave to the verification question about their current location. Respondent answers coded as "don't know" or "refused" were excluded from analysis. This produced four possible combinations of interviewer guess and respondent reply – home/home, home/away, away/home, and away/away. We assessedthe percentage of total calls that fell into each of those four categories, the overall accuracy of interviewer guesses, and how often the interviewer was able to correctly identify that a respondent was home versus away.

Because this process of identifying respondent location was something new that had not previously been attempted with NORC interviewers, we wondered if their accuracy might improve over time working on this study, or if interviewers with more experience in general would be stronger at this task than those who were more recently hired. We examined whether interviewers' length of tenure at NORC or their number of completed interviews on the current study resulted in improved accuracy rates.

To study the relationship between interviewers' perceptions of cell respondents' locations and success in completing interviews, we looked first at interviewer guesses in each of the 7,642 cell telephone calls that involved human contact. Cases with no human contact were excluded from analysis. Using all interviewer guesses, we calculated overall rates of respondents seeming to be home versus away from home. We also compared interview completion rates based on whether respondents were guessed to be at home or away on their first contacts with interviewers. We used t-tests to test for significant differences in overall completion rates, completion rates on first calls, and completion rates on calls after the first call. Finally, we looked for patterns of interview completion based on guessed location on the first two respondent contacts. If differences between respondents first contacted at home and those first contacted away from home emerge, it could indicate that strategic changes to calling rules would be beneficial.

Results

Interviewer Accuracy

Of the 592 completed interviews, interviewers guessed that respondents were home 86% of the time (N=512). Just 14% of interviewer guesses were that the respondent was away (N=80). Respondents were indeed more likely to report being home (74%, N=437) than away (26%, N=155), but less so than what was predicted by interviewer guesses. The breakdown of interviewer guesses versus respondent answers is shown in Table 1.

Home guesses by interviewers were more likely to be correct than away guesses. Nearly 80% of home guesses proved to be correct using the respondent verification question compared to just 65% of away guesses. Overall, interviewers were able to correctly guess whether a respondent was home or away 78% of the time.

Looking at it another way, interviewers showed especially high levels of accuracy identifying respondent who were home, as they correctly identified these respondents on 409 out of 437 calls, or 94% of the time. Their accuracy slipped considerably when attempting to identify respondents away from home. Interviewers correctly identified respondents who were out of the house on 52 of 155 calls, or just 34% of the time.

Interviewer tenure was not found to be a significant factor in the accuracy of interviewer guesses, nor was the number of interviews an interviewer had already completed for the study at the time of the guess.

Differences in Call Outcomes Based on Home/Away Guesses

Including both completed interviews and calls where the respondent broke off, there were 7,642 calls that involved human contact and, thus, where an interviewer guessed the respondent's location. Interviewers guessed that respondents were home 63% of the time (N=4,791) and away 37% of the time (N=2,851).

We found that cases where the interviewer guessed that the respondent was home on the first contact were significantly more likely to ever complete than if the interviewer had guessed that respondent was away from home. Respondents who were guessed to be home on their first call eventually completed the interview 15% of the time. Respondents guessed to be away eventually completed just 9% of the time. This difference was statistically significant ($p<0.001$). A similar pattern emerged for the rates at which respondents completed the screening process.

The increased likelihood of ever completing for respondents contacted at home first was driven mainly by differences in the likelihood of respondents to complete specifically on their first contact. We found a completion rate of 10% on the first call for respondents guessed to be at home compared to a completion rate of just 3% for respondents guessed to be away from home. This difference is also statistically significant ($p<0.001$). We found no significant difference in completion rates after first contact between respondents who were guessed to be at home compared to those who were guessed to be away. Again, screening rates closely resemble the pattern for interview completion. These findings indicate that tailoring the timing of first contacts to maximize the chances of reaching a respondent at home could boost completion rates. Eventual completion rates, completion rates on first contact, and completion rates on second contact or later can be found in Figure 1.

Among cases with at least two location guesses, respondents who were guessed to be away on the first contact but then guessed to be home upon second contact eventually completed the survey at a rate of 16%. Respondents who were guessed to be at home on the first call but away on the second showed significantly lower completion rates, with just 9% eventually completing ($p<0.01$). Respondents guessed to be home for each of the first two calls completed at a rate of 14%. Respondents away from home on the first two

calls eventually completed 12% of the time. Neither of these groups differed significantly from the other groups. These results are displayed in Figure 2.

Limitations

While the present study provides a measure of interviewer accuracy in guessing cell respondents' locations, there is a limitation involved with this measure. The guess question that was paired with the verification question asked of respondents directly was included fairly late in the interview. This means that interviewers typically had been on the phone with respondents for quite a while (perhaps 10-15 minutes) when making this guess. This probably allowed them to gather more cues about location than they usually had for breakoff calls, which often ended much more quickly. Thus, it is possible that the accuracy of guesses would be lower for quicker phone calls.

Conclusions and Future Research

The first goal of this study was to determine how accurate interviewers would be in determining whether cell phone respondents were at home or away from home. Our results were encouraging in that interviewers were relatively accurate. While they showed a bias toward guessing that respondents were at home, this finding makes intuitive sense given the tools at their disposal. Based on anecdotal evidence from interviewer debriefings, it seems that background noise on the line is a very important cue in determining location. It seems plausible that many respondents who were guessed to be at home, but who reported being away from home, were in a quiet location away from home (e.g., at work). Even without perfectly accuracy, we feel that the interviewer guesses could be leveraged effectively in future work.

The fact that interviewers guessed that cell respondents were away from home on 37 percent of cell calls that had human contact, combined with their bias toward guessing that people were at home, suggests that the true proportion of calls that are answered while away from home may be even higher than 37 percent. This confirms our feeling that tailoring interviewer / respondent interactions based on location is more important than ever.

Our investigation of the second research question confirms that there is a relationship between interviewers' perceptions of cell respondents' locations and success in completing interviews. Recalling the recent literature (Lavrakas, et al., 2010; Ward, et al. 2014), we know that data quality may be related to location, with higher data quality being associated with being at home as opposed to away from home. Given this, it seems to be advantageous to make early contacts with respondents while they are at home rather than away from home. To make this a reality in practice, it may be possible to reach higher proportions of cell respondents at home by scheduling first dials for cell phone cases at times when they are more likely to be home. A preliminary look at this using our interviewer guess data indicates that a slight majority of respondents reached during mid-day hours were guessed to be away from home, while a slight majority of respondents reached during the evening and night hours were guessed to be at home. To the extent that we can schedule first dials to cell phone cases later in the day, we may be able to increase our interview completion rates.

For cases where respondents seem like they are away from home on the first contact, it

seems beneficial to attempt to schedule callbacks for a time when they plan to be home. One area for future study is investigating additional ways to tailor rules for recontacting respondents who are believed to be away from home, especially for those who end phone calls too quickly to provide a specific callback time. This could involve changing the times of the day that we call back, the length of delays between calls, etc.

Another avenue for potential further study is the specific way to intervene with respondents who seem to be away from home. One possibility would be to directly suggest that we call these respondents back at a more convenient time. This strategy would be contrary to the typical tactic, which suggests keeping respondents engaged on the phone for as long as possible. This approach of showing consideration for the respondents' current situation and offering to reach them at another time could prove beneficial if follow-up calls successfully reached respondents at times when they are at home. On the other hand, this approach could potentially increase breakoffs, increase the time spent contacting respondents, and decrease the overall level of cooperation. A comparison of these approaches would require a careful investigation of costs and hours spent, as well as coverage and bias.

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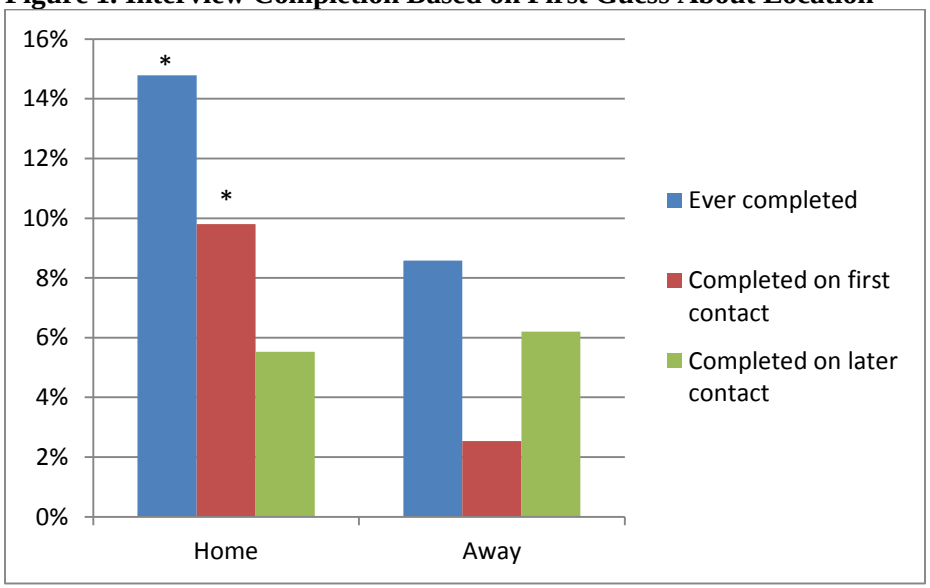
Appendix

Table 1. Accuracy of Interviewer Guesses

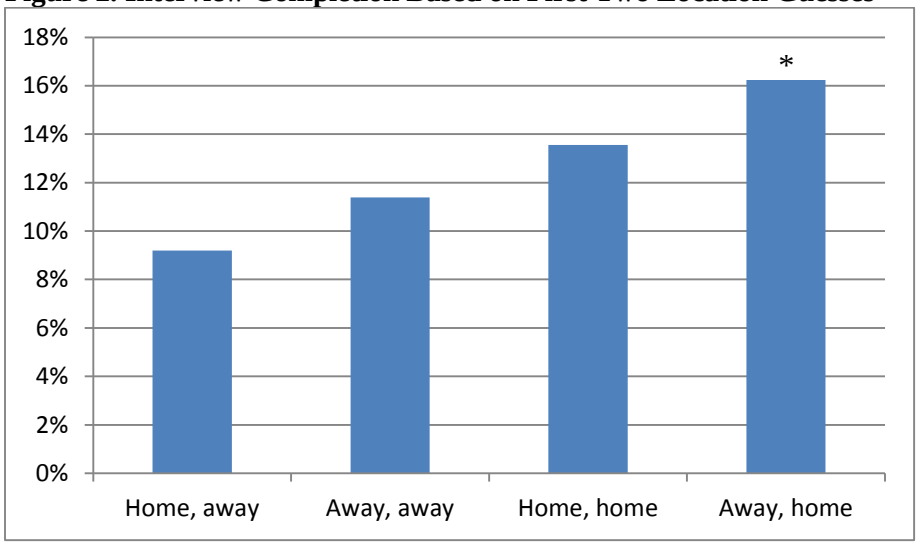
	Respondent Answer	
Interviewer Guess	Home	Away
Home	69% (N=409)	17% (N=103)
Away	5% (N=28)	9% (N=52)

Figure 1. Interview Completion Based on First Guess About Location



*Significant difference compared to away, p<0.001

Figure 2. Interview Completion Based on First Two Location Guesses



*Significant difference compared to Home, away, p<0.01