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MEMORANDUM FOR ACS Research and Evaluation Advisory Group

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Subject: Impact of Multiple Contacts by Computer-Assisted Telephone Interview
and Computer-Assisted Personal Interview on Final Interview Outcome
in the American Community Survey

Attached is the final American Community Survey Research and Evaluation report "Impact of Multiple Contacts by Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview on Final Interview Outcome in the American Community Survey." This report summarizes the results of an exploratory analysis of the impact of multiple contacts on interview outcomes for housing units in the American Community Survey. The objective was to determine whether the number of follow-up contacts by telephone and personal visit, perceived by some respondents to be harassment, are in fact impacting their decision to provide information in the American Community Survey. Based on the findings, we suggest possible changes to the follow-up operations that may help to reduce this perceived harassment, as well as continued research.

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Impact of Multiple Contacts by Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview on Final Interview Outcome in the American Community Survey

FINAL REPORT

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EXECUTIVE SUMMARY

Objective

A Congressional hearing on the American Community Survey (ACS) included testimony that the Census Bureau repeatedly contacted households that did not want to participate. We undertook this research to better understand the use and impact of multiple contacts in the ACS. During the mailout/mailback month, sample households can receive up to five mailing pieces (six starting with the January 2013 ACS production sample). During nonresponse follow-up by Computer-Assisted Telephone Interviewing (CATI), cases are closed out after an interview, two refusals, four hang-ups, 20 unproductive calls, 25 calls if contact is made with the household, or the month ends. Computer-Assisted Personal Interviewing (CAPI) follow-up operations close a case after an interview, a refusal that cannot be converted by a field supervisor, an interviewer's monthly allocation of interview time has expired (which is about 2.2 hours per case on average nationwide), or the month ends. In light of the potentially high number of contact attempts in CATI and CAPI, we designed this research to determine if we could reduce multiple contacts (and perceived harassment by some households) while still maintaining the current high response rate.

The results from this research will help determine the next steps in CATI and CAPI methodology. Specifically, managers can use these results to determine the ideal number of contacts that will provide the best interview outcome depending on the early disposition of the case. If the results indicate that reducing the number of contacts does not harm the final interview outcome rate, we may conduct additional research, including testing variations of the number of CATI and CAPI contacts attempted for each sampled address and looking into any potential nonresponse bias to data items. The results of this study may also provide additional insight for the mode switch research currently being conducted at the Census Bureau.

Methodology

This research looked at the impact of multiple contacts in the CATI and CAPI modes on the final ACS interview outcome. The focus of the analysis was to examine intermediate outcomes and their associated final outcomes in each mode to determine if there was an optimal course of action after receiving initial resistance from a respondent. We used paradata from both ACS CATI and CAPI production operations (June 2011 to February 2012 panels) to answer the research questions.

Research Questions and Results

- *How effective are the current CATI efforts in obtaining an ACS interview? Based on the final outcome of the current CATI efforts, would it be possible to lower the current maximum number of CATI calls in order to reduce respondent annoyance from multiple contacts while maintaining a comparable level of resulting interviews?*

Excluding cases with invalid or unusable phone numbers, CATI has an interview rate of 51.4 percent for June 2011 to February 2012. Looking at CATI overall, the data suggest that the CATI call limit could be lowered while still preserving the majority of the number of

interviews which should reduce perceived harassment. The interview rate hovers between 35 and 45 percent for cases resolved in up to 16 calls, and declines afterwards. The percentage of interviews obtained at a particular call number could be an underestimate as a sufficient partial interview may have been obtained on an earlier call, with subsequent calls made to complete the interview, driving up the call count.

- *When resistance in CATI first occurs (refusal, hang-up, callback request), how successful are follow-up contacts? Should the number of CATI call attempts be changed following resistance?*

Very few cases were converted to interviews (9.3 percent) after three hang-ups occurred, suggesting we could lower the hang-up limit from four to three. About 25 percent of the sample cases with an explicit or implicit refusal as part of the call history ended as an interview. In general, if resistance did occur, it occurred rather quickly (median of 2 calls). After that, either the case was resolved within a median of 2-9 additional calls or the case continued in CATI until reaching the call maximum of 20 or 25 total calls. Therefore, we could reduce the number of additional calls to households with an explicit or implicit refusal by lowering the call maximum.

- *What percent of final CATI refusals are selected for CAPI? How effective are the current CAPI efforts in obtaining an ACS interview? Should procedures in CAPI differ depending on the final CATI outcome?*

We sample noninterviewed households for CAPI at an overall rate of roughly 1 in 3 households, independent of final CATI outcomes. Therefore, we selected approximately 30 percent of CATI refusals for CAPI. Overall, the data show that CAPI interviewers are quite persuasive and very good at obtaining an interview. Excluding Type C cases (which are ineligible/out-of-scope), CAPI has an interview rate of 95.5 percent. The final outcomes for the cases that were not classified as interviews are 2.3 percent refusals and 2.3 percent Type A noninterviews. There is a slight tendency for those that gave an explicit refusal in CATI to end as a refusal in CAPI, but it may not be enough of a trend to warrant a change in the CAPI procedures. Additional research is needed to investigate this further.

- *When CAPI resistance first occurs, how effective are additional contact attempts?*

In general, CAPI interviewers are very successful at gaining respondent cooperation. For cases that show reluctance but are not coded as refusals, the interview rate is 94.5 percent compared to a 26.8 percent interview rate for cases with a coded refusal. The low interview rate for coded refusals may be due to 42 percent of cases being closed out by the Regional Office after only one coded refusal, which means we are not harassing those respondents anymore.

- *What are the main reasons for respondent refusal and reluctance in the CATI and CAPI modes?*
 - In CATI, the most common refusal reason was that the respondent refused to give information over the phone, followed by concerns about the legitimacy of the survey and the respondent being too busy.
 - In CAPI, coded refusals cited firm reasons or actions (“not interested,” “hang-up,” “slams door,” and “threatens interviewer”) and privacy most often, while those with only reluctance reasons noted privacy concerns and scheduling most often.

1. BACKGROUND

A Congressional hearing on the American Community Survey (ACS) included testimony that the Census Bureau repeatedly contacted households that did not want to participate. We undertook this research to better understand the impact of multiple contacts in the ACS. When the data used in this analysis were collected, the ACS used three modes of data collection over a three-month period: mailout/mailback of a paper questionnaire in month 1, Computer-Assisted Telephone Interview (CATI) in month 2, and Computer-Assisted Personal Interview (CAPI) in month 3.¹ In general, sampled addresses were contacted by mail first, nonrespondents for whom we have a valid phone number were then contacted by CATI, and finally, remaining nonrespondents were subsampled for CAPI. During the mailout/mailback month, households could have received up to five mailing pieces (six starting January 2013). During CATI, cases are closed out after an interview, two refusals, four hang-ups, 20 unproductive calls, 25 calls if contact is made with the household, or the month ends. CAPI operations close a case after an interview, a refusal that cannot be converted by a field supervisor, the interviewer's monthly allocation of interview time has expired (which is about 2.2 hours per case on average nationwide), or the month ends. In light of the potentially high number of contact attempts in CATI and CAPI, we designed this research to determine if we could reduce multiple contacts (and perceived harassment by some households) while still maintaining the current high response rate.

Previous studies have found that multiple contacts in mail surveys have a positive effect on survey response (Yammarino et al., 1991). However, these studies mostly looked at the effect of contact attempts (usually only a few) versus no additional contact attempts.

In 2000, the Federal Highway Administration conducted an experiment related to the National Household Travel Survey. In that experiment, McGuckin and colleagues (2001) administered a telephone survey to two experimental panels: one panel received a maximum of nine calls, the other panel a maximum of 19 calls. They found that most of the productive calls happened on the first few calls and leveled off after eight or nine calls. About 28 percent of people who initially refused ended up completing the survey; about 24 percent of people who asked the interviewer to call back ended up completing the survey.

With the ACS methodology and previous studies in mind, the focus of this research was to determine how much effort we should use to get responses in the CATI and CAPI phases while limiting the number of contacts a sampled household receives so as not to appear that we are harassing respondents. Specifically, is there a point where we can stop contacts sooner than our current procedures with minimal effect on the ACS response rate? In particular, we examined respondent behavior in CATI after a refusal, hang-up, or request for a callback as recorded by the interviewers to determine the optimal course of action for these cases. In

¹ Starting with the January 2013 ACS production panel, the Census Bureau added an Internet self-response mode during the first month of data collection. Only nonrespondents to the Internet mode are mailed a paper questionnaire. The CATI and CAPI procedures were not changed.

CAPI, we examined respondent behavior after a coded refusal or a reluctance reason was recorded by the interviewers. The key is finding the right balance between the best efforts by interviewers, minimal respondent harassment, and the desired survey result: an interview.

2. METHODOLOGY

This research looked at the impact of multiple contacts in the CATI and CAPI modes on the final ACS interview outcome. Past research suggested examining intermediate outcomes and their associated final outcomes in each mode to determine the optimal course of action after receiving initial resistance. Tables 1 and 2 provide the definitions for the relevant types of intermediate and final outcomes for CATI and CAPI, respectively.

During both the CATI and CAPI months, a late mail return may be received from a household. We removed these cases from this analysis.

We used paradata from ACS CATI and CAPI operations for the June 2011 to February 2012 production panels for this research. Paradata for CATI were collected from WebCATI and for CAPI using the Contact History Instrument (CHI). The CHI began collecting ACS CAPI operational data in a limited capacity in July of 2011, expanding to all CAPI operations in August of 2011 (which corresponds to the CAPI collection of the June 2011 panel). All of the data presented in this report are unweighted because this is an exploratory analysis of what happened in the nine months for CATI and CAPI covered in this report.

2.1. CATI Outcomes

We used information from both the CATI history files and the CATI status files to assign cases to specific categories for this analysis. The CATI history files contain the outcome for each CATI contact made with a sample case. We used this information to assign an intermediate outcome² (listed in Table 1 below) to each contact that indicated respondent reluctance. The CATI status files contain the final CATI status for each sample unit based on the CATI contact history. We assigned each case to one of the final CATI outcome categories listed in Table 1 based on information from both the history and status files. We used the intermediate outcome to further delineate cases with a final outcome of refusal. These categories are mutually exclusive and were assigned in a hierarchical order (as listed); that is, once a case was assigned a final outcome, it was not eligible for successive categories. The final CATI outcome category assignment is as follows.

If a case had a final CATI outcome status of a complete or sufficient partial interview, the case was assigned to the “Interview” category, regardless of whether there were intermediate reluctance outcomes along the way. Next, we looked at refusals. If a case had a final CATI status of refusal (i.e., hostile breakoff, refusal, pre-refusal - explicit refusal or hostile breakoff),

² There are other intermediate outcome codes but we included codes that indicate respondent reluctance which is the focus of this analysis.

we looked at the CATI history file to determine the number and type of intermediate outcomes for each case. If there were two or more contacts with an intermediate outcome of “Refusal”, the case was assigned to the “Refusal: Two explicit” category. If there was one contact with an intermediate “Refusal” outcome and at least one contact with a hang-up, the case was assigned to the “Refusal: Mixed explicit and implicit.” Remaining cases with an intermediate explicit refusal outcome were assigned to the “Refusal: One explicit” category. The number of hang-ups determined the assignment to the next two categories of “Maximum hang-ups” and “Hang-ups.” Next, we assigned cases to the “Call maximum” group based on the final CATI outcome. The remaining cases were assigned to one of two “Other” groups based on whether it was eligible for CATI. We excluded cases with late mail returns from this analysis.

Table 1. CATI Intermediate and Final Outcome Categories

Intermediate Outcomes	Refusal	Gatekeeper or nonrespondent refusal, refusal, or hard refusal (Explicit refusal)
	Hang-up	Immediate hang-up (Implicit refusal)
	Callback	Request for interviewer callback
Final Outcomes	Interview	Includes complete and sufficient partial interviews: <ul style="list-style-type: none"> • Fully complete interview • Sufficient Partial • Sufficient Partial set at closeout • Sufficient Partial w/planned callbacks
	Refusal: Two explicit	Two explicit refusals
	Refusal: Mixed explicit and implicit	Mixed explicit and implicit refusals
	Refusal: One explicit	One explicit refusal
	Refusal: Maximum hang-ups	Four hang-ups
	Refusal: Hang-ups	1-3 hang-ups
	Call maximum ³	Exceeded unproductive call maximum
	Other (Noninterview)	<ul style="list-style-type: none"> • Sample unit eligible but unavailable through Closeout • Sample unit not found/unreached/eligibility uncertain • Congressional case (deleted) • Insufficient partial • Language barrier • Hearing barrier • Privacy Detector • Never contacted - confirmed number
	Other (Ineligible)	<ul style="list-style-type: none"> • Sample Unit ineligible - out of scope • Never contacted - unconfirmed number

³ The call maximum is 20 calls if there is no contact with the household or 25 calls if an interviewer makes contact at least once with the household.

2.2. CAPI Outcomes

The CHI contains information for each CAPI contact including a final outcome code, if the case were to end with that contact. For each contact, interviewers provide information about any respondent reluctance with multiple reasons permitted. We used this reluctance information and final CAPI outcome codes to assign intermediate outcomes and a final outcome category to each CAPI case as noted in Table 2.

Table 2. CAPI Intermediate Final Outcome Categories

Intermediate Outcomes	Coded Refusal	Intermediate outcome was coded as a refusal
	Reluctance but Not Refusal	Was not coded as a refusal, but reluctance reason(s) given
Final Outcomes	Interview	Includes complete interviews (occupied, temporarily occupied, vacant) and sufficient partial interviews (occupied)
	Type A Refusal	Noninterview due to respondent refusal
	Other Type A Noninterview	Noninterview due to language problems, inability to locate the address, no one home, or residents temporarily absent
	Type C Noninterview	Noninterview due to unit being under construction, demolished, house/trailer moved or empty mobile home site, permanent business or storage, merged with another unit, condemned, unit nonexistent, address nonexistent, or group quarters

2.3. Research Questions

The research questions for this study are as follows.

- How effective are the current CATI efforts in obtaining an ACS interview? Based on the final outcome of the current CATI efforts, would it be possible to lower the current maximum number of CATI calls in order to reduce respondent annoyance from multiple contacts while maintaining a comparable level of resulting interviews?
- When resistance in CATI first occurs (refusal, hang-up, callback request), how successful are follow-up contacts? Should the number of CATI call attempts be changed following resistance?
- What percent of final CATI refusals are selected for CAPI? How effective are the current CAPI efforts in obtaining an ACS interview? What is the distribution of the number of contacts by final CAPI outcome? Should procedures in CAPI differ depending on the final CATI outcome?
- When CAPI resistance first occurs, how effective are additional contact attempts?
- What are the main reasons for respondent refusal and reluctance in the CATI and CAPI modes?

Section 4 provides the analysis results for each of the research questions.

3. ASSUMPTIONS AND LIMITATIONS

3.1. Assumptions

3.1.1. Quality of Interviewer-Recorded Paradata

There are two possible types of data collected by an interviewer: the survey data collected from the respondent and the paradata or process data collected during the (attempted) interview. For interviewer-administered surveys, paradata can include response times, respondent expressions, and interviewer observations (e.g., lady of the house seemed rushed). While we train interviewers on how to collect both survey data and paradata, it is possible interviewers collect paradata in a less rigorous manner since they may not consider paradata as critical to the outcome of the interview. This analysis assumes that interviewers have entered the paradata accurately and to the best of their ability.

3.1.2 Interviewer Behavior

For this research, we assumed the outcome for each intermediate contact reflected the interviewer's best efforts to obtain an interview. However, this may not always be the case.

CATI is a shared-case system based on transactions where retry rules are programmatically implemented that prevent an interviewer from making more than a certain amount of call attempts per day, and limits the amount of calls an interviewer can make to a case during its life cycle in CATI. On each contact, a case may be attempted by a different interviewer in one of three telephone centers. Interviewers are evaluated on the results of many cases in a shift, not on the outcome of a specific case. Early in the data collection life cycle, there may be a bias toward not pushing a respondent so hard that they refuse in order to limit the interviewer's negative outcome statistics.

In CAPI, a case is owned by an interviewer and the approach for contacting a case can be customized by the interviewer within their monthly allocation of work hours. There are no rules in CAPI that limit, by day or overall, the amount of contact attempts by phone or personal visit.

3.2. Limitations

3.2.1. Coding of CAPI Interviewer Notes

The reluctant reason variable from the CHI contains both codes of reluctance reasons as well as possible free-form interviewer notes with varying levels of usefulness. There are four categories of reluctance reason and notes combinations:

1. A meaningful code and a note that enhances the meaning of the code
e.g. “Family issues” code and note: “GOH⁴ was trying to help, LOH⁵ completed instrument”
2. A meaningful code and a note that repeats the meaning of the code
e.g. “Too busy” code and note: “Busy with two jobs”
3. A meaningful code and a note with little value for this analysis
e.g. “Too busy” code and note: “Call Sunday after 6pm”
4. An ambiguous code and a meaningful free-form note
e.g. “Other” code and note: “Too many Census visits already”

We did review of the CHI data notes that accompanied a meaningful code and found they did not offer much new information in most cases. For this reason, and because free-form interviewer notes would be difficult to code, we did not use information found in free-form interviewer notes for this analysis.

3.2.2. CAPI Contacts

Households selected for CAPI can be contacted by personal visit or telephone, while households can be contacted only by telephone during CATI. The one caveat is that a household that refused in CATI must be contacted by personal visit in CAPI for the first CAPI contact. For this analysis, CAPI visits and telephone calls are not differentiated, and instead both are referred to as contacts. While this must be done for the sake of ease of processing, it may mask differences in CAPI success between phone calls and personal visits.

In addition, CAPI will end after an interviewer has worked on his or her case workload for the allocated hours for the month, which is very different from the 20-call cutoff in CATI. This dependency on time, rather than contact count, may mask underlying trends. For example, the contact time may elapse without the interviewer completing an interview after five contacts with one household, while it may take ten contacts for another household due to differences in travel distance from the interviewer’s home to the sampled address.

⁴ Gentleman of the household.

⁵ Lady of the household.

4. RESULTS

In the following sections, we analyze the data in various ways to answer the research questions in Section 2.3. We focus on the analysis of the CATI paradata alone, the CAPI paradata alone, the CAPI paradata assuming we know what happened in CATI, and then discuss reasons given in both CATI and CAPI for reluctance or refusal. The Appendix includes additional research we conducted to examine the effects of CAPI vacant and temporarily occupied cases on the CAPI interview results.

4.1. How effective are the current CATI efforts in obtaining an ACS interview? Based on the final outcome of the current CATI efforts, would it be possible to lower the current maximum number of CATI calls in order to reduce respondent annoyance from multiple contacts while maintaining a comparable level of resulting interviews?

To answer these research questions, we looked at the final CATI outcomes defined in Table 1 and the number of calls it took to obtain each final outcome. Managers could use any relevant findings from this analysis to modify the CATI operations to reduce perceived respondent harassment.

Table 3 displays the distribution of final CATI outcomes, as defined in Section 2.1, including all cases, excluding the “Other (Ineligible)” category, and excluding all “Other” cases.

Table 3. Distribution of CATI Cases by Final CATI Outcome

Final CATI Outcome	Percent	Percent Excluding Other (Ineligible)	Percent Excluding ALL Other
Interview	24.2	51.4	58.4
Refusal (2 explicit)	2.3	4.8	5.5
Refusal (mix explicit/implicit)	2.2	4.6	5.2
Refusal (1 explicit)	1.0	2.1	2.4
Refusal (maximum (4) hang-ups)	0.9	2.0	2.3
Refusal (1-3 hang-ups)	2.8	6.0	6.8
Reached call max	8.0	17.1	19.5
Other (Noninterview)	5.7	12.1	-
Other (Ineligible)	52.9	-	-
Total	783,276	368,800	324,176

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

The majority of final outcomes fell into the “Other (Ineligible)” category with more than 98.7 percent due to unconfirmed phone numbers and the remainder being out of scope for ACS. Excluding these cases from the distribution, CATI interviewers were able to obtain an interview for about 51.4 percent of the eligible universe (97.5 percent of all interviews were complete

interviews while 2.5 percent were sufficient partial interviews⁶). While 19.5 percent of cases indicated their refusal in some way and were not converted to an interview, 17.1 percent of cases were called until the call maximum had been reached with no intermediate refusal outcome. Among the refusals, some cases also reached the call maximum but were classified into one of the refusal categories using the hierarchical final CATI outcome assignment described in section 2.1. The remaining 12.1 percent were “Other (Noninterview)” cases, with 51.8 percent insufficient partial interviews and 35.8 percent cases had privacy detectors on their phones.

Table 4 shows the distribution of final CATI outcomes by the total number of call attempts made to obtain a final outcome. For example, among all cases that only needed one call to be resolved, 12.7 percent obtained an interview with the rest (87.0 and 0.3 percent, respectively) in “Other (Ineligible)” and “Other (Noninterview).”

⁶ A respondent did not have to make it to the end of the survey for the contact to be considered an interview. Instead, a respondent could answer enough of the questions to be considered a sufficient partial interview.

Table 4. Final CATI Outcome by Total Number of CATI Calls

Total Number of CATI Calls	Final CATI Outcome									Count (n)
	Interview (%)	Ref_ 2expl (%)	Ref_ mixEI (%)	Ref_ 1expl (%)	Ref_ maxhngup (%)	Ref_ hngup (%)	Callmax (%)	Other (Nonint.) (%)	Other (Ineligible) (%)	
1	12.7	-	-	-	-	-	-	0.3	87.0	242,336
2	39.0	1.8	1.2	0.0	-	0.0	-	1.7	56.3	83,900
3	26.2	2.3	1.6	0.0	-	0.0	-	3.9	66.0	81,368
4	37.8	4.2	2.9	0.0	0.6	0.1	-	7.0	47.4	43,652
5	45.1	5.0	3.9	0.0	1.4	0.1	-	8.2	36.3	30,726
6	36.7	4.8	3.9	0.1	1.5	0.2	-	6.4	46.5	29,955
7	44.5	6.2	5.1	0.1	2.2	0.2	-	7.1	34.5	20,458
8	45.7	6.7	6.0	0.2	3.2	0.4	-	6.6	31.2	16,350
9	47.0	7.0	6.6	0.2	3.7	0.7	-	6.5	28.4	13,526
10	37.9	6.1	5.7	0.3	3.4	0.5	-	4.7	41.4	14,538
11	43.6	7.0	7.0	0.5	4.0	1.0	-	5.7	31.2	11,019
12	41.9	6.4	7.6	0.8	4.5	1.2	-	6.1	31.5	9,925
13	43.1	6.8	7.4	1.1	4.8	1.8	-	8.2	26.7	8,639
14	41.7	6.8	7.8	1.7	4.8	2.8	-	10.9	23.6	7,686
15	39.5	6.2	7.5	2.4	4.1	4.0	-	11.7	24.6	7,447
16	34.1	5.2	7.0	2.9	3.9	6.4	-	11.7	28.8	7,411
17	25.3	3.9	5.4	3.0	3.4	6.9	-	12.6	39.5	9,004
18	21.8	3.3	4.9	3.0	3.1	8.7	-	14.4	40.7	9,069
19	20.1	3.0	4.5	3.0	3.1	9.0	-	15.1	42.3	8,961
20	2.6	0.4	0.7	0.5	0.4	1.4	87.0	2.1	5.1	60,722 ⁷
21	9.5	1.7	2.7	2.3	1.7	6.8	58.7	7.6	9.1	12,758
22	16.3	2.9	4.9	4.6	2.9	14.5	24.7	16.7	12.6	6,205
23	16.8	3.0	5.0	5.7	3.7	18.5	14.7	19.5	13.0	4,934
24	18.8	3.2	5.8	6.0	3.5	20.6	7.7	23.8	10.6	4,221
25	5.0	0.4	1.3	11.7	0.4	35.6	0.5	36.9	8.2	37,866
26	7.1	0.5	2.5	13.1	0.2	26.0	-	45.6	5.1	566
27	7.1	3.6	-	10.7	-	28.6	-	39.3	10.7	28
28	16.7	-	-	16.7	-	-	-	16.7	50.0	6

- Indicates that there were no cases in the cell.

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Starting with cases resolved in four⁸ call attempts, cases resolved in up to 16 call attempts have interview rates between about 35 and 45 percent (staying fairly stable around 40 percent), and after 17 calls the interview rate starts dropping considerably.

⁷ There were sharp increases in the total counts for the number of cases that received 20 and 25 calls. Per CATI procedures, cases are called 20 times if no calls were productive (i.e. no contact was made with the household) or 25 times if at least one call was productive.

⁸ Interview rates for cases resolved in one to three call attempts are heavily influenced by cases with the two "Other" final outcomes, making them uniquely different.

Table 5 shows the distribution (percentage and cumulative percentage) of the number of CATI calls by final CATI outcome. For example, 16.2 percent of all cases that obtained an interview were resolved on the first call, an additional 17.3 percent of interviews took two calls to resolve with a cumulative percent of 33.5. Additionally, 38.1 percent of cases with two explicit refusals were resolved in five or fewer calls.

Table 5. Distribution of Total Number of Calls for Each Final CATI Outcome

Total Number of CATI Calls	Final CATI Outcome																	
	Interview		Ref_2expl		Ref_mixEI		Ref_1expl		Ref_maxhngup		Ref_hngup		Callmax		Other (Nonint.)		Other (Ineligible)	
	%	Cuml. %	%	Cuml. %	%	Cuml. %	%	Cuml. %	%	Cuml. %	%	Cuml. %	%	Cuml. %	%	Cuml. %	%	Cuml. %
1	16.2	16.2	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.7	50.9	50.9
2	17.3	33.5	8.5	8.5	6.2	6.2	0.0	0.0	-	-	0.0	0.0	-	-	3.1	4.8	11.4	62.3
3	11.3	44.8	10.6	19.2	7.5	13.7	0.0	0.0	-	-	0.1	0.1	-	-	7.1	11.9	13.0	75.2
4	8.7	53.5	10.2	29.4	7.5	21.2	0.1	0.1	3.6	3.6	0.2	0.3	-	-	6.8	18.7	5.0	80.2
5	7.3	60.8	8.7	38.1	7.0	28.2	0.2	0.3	5.8	9.4	0.1	0.4	-	-	5.6	24.3	2.7	82.9
6	5.8	66.6	8.1	46.1	6.9	35.1	0.2	0.5	6.0	15.4	0.3	0.7	-	-	4.3	28.6	3.4	86.3
7	4.8	71.4	7.2	53.3	6.2	41.3	0.4	0.9	6.2	21.6	0.2	0.9	-	-	3.2	31.8	1.7	88.0
8	3.9	75.4	6.2	59.5	5.8	47.0	0.5	1.4	7.2	28.8	0.3	1.2	-	-	2.4	34.2	1.2	89.2
9	3.4	78.7	5.3	64.8	5.3	52.3	0.4	1.8	6.9	35.6	0.4	1.6	-	-	2.0	36.2	0.9	90.1
10	2.9	81.6	5.0	69.8	4.9	57.2	0.7	2.5	6.7	42.3	0.3	1.9	-	-	1.5	37.7	1.5	91.6
11	2.5	84.2	4.3	74.1	4.6	61.8	0.7	3.1	6.1	48.4	0.5	2.4	-	-	1.4	39.1	0.8	92.4
12	2.2	86.4	3.6	77.7	4.4	66.2	1.0	4.2	6.1	54.5	0.6	3.0	-	-	1.3	40.5	0.8	93.2
13	2.0	88.3	3.3	81.0	3.8	70.0	1.3	5.5	5.7	60.2	0.7	3.7	-	-	1.6	42.1	0.6	93.7
14	1.7	90.0	2.9	84.0	3.5	73.5	1.7	7.2	5.1	65.3	1.0	4.7	-	-	1.9	43.9	0.4	94.1
15	1.6	91.6	2.6	86.6	3.3	76.8	2.3	9.5	4.2	69.5	1.4	6.1	-	-	2.0	45.9	0.4	94.6
16	1.3	92.9	2.2	88.8	3.1	79.9	2.8	12.3	4.0	73.5	2.1	8.2	-	-	1.9	47.8	0.5	95.1
17	1.2	94.1	2.0	90.7	2.9	82.8	3.6	15.8	4.1	77.7	2.8	11.0	-	-	2.5	50.4	0.9	96.0
18	1.0	95.1	1.7	92.4	2.6	85.4	3.6	19.4	3.9	81.5	3.6	14.6	-	-	2.9	53.3	0.9	96.9
19	1.0	96.1	1.5	93.9	2.4	87.8	3.5	22.9	3.8	85.3	3.7	18.3	-	-	3.0	56.3	0.9	97.8
20	0.8	96.9	1.3	95.2	2.4	90.2	3.7	26.7	3.0	88.2	3.8	22.1	83.7	83.7	2.8	59.1	0.7	98.5
21	0.6	97.6	1.2	96.4	2.0	92.2	3.8	30.5	2.9	91.2	3.9	26.0	11.9	95.6	2.2	61.3	0.3	98.8
22	0.5	98.1	1.0	97.4	1.8	94.0	3.7	34.2	2.4	93.6	4.1	30.1	2.4	98.1	2.3	63.6	0.2	99.0
23	0.4	98.5	0.8	98.3	1.5	95.5	3.7	37.9	2.5	96.1	4.1	34.2	1.1	99.2	2.2	65.8	0.2	99.1
24	0.4	99.0	0.8	99.0	1.4	96.9	3.3	41.2	2.0	98.1	3.9	38.2	0.5	99.7	2.3	68.0	0.1	99.2
25	1.0	100.0	0.9	100.0	3.0	99.9	57.8	99.0	1.9	100.0	61.1	99.3	0.3	100.0	31.3	99.4	0.7	100.0
26	0.0	100.0	0.0	100.0	0.1	100.0	1.0	99.9	0.0	100.0	0.7	100.0	-	100.0	0.6	100.0	0.0	100.0
27	0.0	100.0	0.0	100.0	-	100.0	0.0	100.0	-	100.0	0.0	100.0	-	100.0	0.0	100.0	0.0	100.0
28	0.0	100.0	-	100.0	-	100.0	0.0	100.0	-	100.0	-	100.0	-	100.0	0.0	100.0	0.0	100.0
Total	189,466		17,758		16,926		7,632		7,312		22,028		63,054		44,624		414,476	

- Indicates that there were no cases in the cell.

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

There are two types of behaviors displayed in the Table 5: either respondents wanted to resolve their case relatively quickly (we obtain over 50 percent of interviews by call 4, “Refusal (2 Explicit)” by call 7, and “Refusal (mixed explicit/implicit)” by call 9) or respondents avoided us after the initial contact (about 60 percent of cases with one explicit refusal or 1 to 3 hang-ups reached the call maximum).

A respondent did not have to make it to the end of the survey for the contact to be considered an interview. Instead, a respondent could answer enough of the questions to be considered a sufficient partial interview. Therefore, a case could have two refusals and end up with a final outcome of an interview. Otherwise, a case with two refusals was counted as a final refusal.

Table 6 shows the distribution of the number of calls it took to get two refusals for those cases that had a final outcome of a refusal and those that had a final outcome of an interview. Only 6.2 percent of cases with two refusals had a final outcome of an interview.

Table 6. Distribution of Number of Calls to get Two Explicit Refusals for Final CATI Outcome Refusals or Interviews

Total Number of CATI Calls	Final CATI Outcome			
	Refusal ⁹		Interview ¹⁰	
	Percent	Cumulative Percent	Percent	Cumulative Percent
2	8.5	8.5	3.7	3.7
3	10.6	19.2	4.8	8.5
4	10.2	29.4	7.6	16.1
5	8.7	38.1	9.2	25.3
6	8.1	46.1	8.5	33.8
7	7.2	53.3	6.8	40.6
8	6.2	59.5	7.0	47.6
9	5.3	64.8	5.9	53.5
10	5.0	69.8	5.3	58.8
11	4.3	74.1	4.2	63.0
12	3.6	77.7	4.4	67.4
13	3.3	81.0	4.9	72.3
14	2.9	84.0	3.7	76.1
15	2.6	86.6	4.6	80.6
16	2.2	88.8	3.1	83.7
17	2.0	90.7	2.4	86.1
18	1.7	92.4	2.5	88.5
19	1.5	93.9	2.4	90.9
20	1.3	95.2	1.7	92.6
21	1.2	96.4	1.8	94.4
22	1.0	97.4	1.6	96.0
23	0.8	98.3	1.4	97.4
24	0.8	99.0	1.2	98.6
25	0.9	100.0	1.4	100.0
26	0.0	100.0	-	100.0
27	0.0	100.0	-	100.0
Total	17,758		1,178	

- Indicates that there were no cases in the cell.

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

We do not know from the data when the partial interview occurred for cases that gave a sufficient partial interview along with two refusals. Two situations could result in a sufficient partial interview:

⁹ The Refusal columns are the same as the Refusal-2 Explicit columns in Table 5, but are repeated here for reference.

¹⁰ Cases in these columns represent a subset of those in the Interview column of Table 5—those that gave two refusals but also gave enough information to be considered an interview.

- The respondent gave enough information to be classified a sufficient partial interview and then refused to answer any more questions and ended the call. The respondent then refused again on a follow-up call.
- Initially, the respondent refused. In a follow-up call, the interviewer convinced the respondent to give enough information to be classified as a sufficient partial interview before the respondent refused to continue.

Continued calling to obtain the second refusal inflates the call count needed to obtain the sufficient partial interview. For example, according to Table 6, over 75 percent of the cases with a final outcome of interview with two explicit refusals were resolved within 14 calls. However, perhaps a higher percentage of the partial interviews had been obtained by an earlier call, and more calls were made to get the second refusal that closed the case.

Looking at CATI overall, the data in Tables 4 through 6 suggest that we could reduce the CATI call limit while still preserving the majority of interviews. This reduction would reduce perceived respondent harassment. As a reminder, the percentage of interviews obtained by a particular call number could be an underestimate because sufficient partial interviews may have been obtained on an earlier call, with subsequent calls made to get a second refusal or the CATI month ended, driving up the call count.

4.2. When resistance in CATI first occurs (refusal, hang-up, callback request), how successful are follow-up contacts? Should the number of CATI call attempts be changed following resistance?

To answer these questions, we looked at what information could be known during the CATI operation. These data may be useful in determining a course of action after a trigger event occurs in CATI while CATI is still ongoing. We examined the following specific trigger events: receiving an explicit refusal, one to three hang-ups, and a request for a callback. We can use the data in Table 7 to help predict the outcome of a case progressing through CATI that has given some resistance along the way.

Note that the rows of Table 7 are not mutually exclusive. Consider a table with mutually exclusive rows for one explicit refusal, one hang-up, two hang-ups, three hang-ups, and one callback, each row with a distinct distribution of final outcomes. Now consider a case is going through CATI and gives one hang-up and you wish to use one of the distributions to predict the likelihood of obtaining an interview for that case. Since you do not know how many additional hang-ups you would receive if you continued calling the case, you do not know whether the case falls into the distribution for one, two or three hang-ups. All you know at the time is that the case has one hang-up, you do not know if you would receive more hang-ups upon further calling. Thus, the rows of Table 7 include all applicable cases that satisfy the trigger criteria. For example, out of all cases that had one or more hang-ups, 26.5 percent ended in an interview, 4.3 percent ended up giving two explicit refusals, etc.

Table 7. Final CATI Outcome of Cases with Resistance

CATI Resistance Type	Final CATI Outcome									Count (n)
	Interview (%)	Ref_ 2expl (%)	Ref_ mixEI (%)	Ref_ 1expl (%)	Ref_ maxhngup (%)	Ref_ hngup (%)	Callmax (%)	Other (Nonint.) (%)	Other (Ineligible) (%)	
1+ Explicit										
Refusals	24.6	27.8	26.5	11.9	-	-	0.0	0.8	8.4	63,902
1+ Hang-ups	26.5	4.3	17.7	2.0	8.5	25.5	0.0	1.1	14.5	86,440
2+ Hang-ups	17.5	2.7	19.2	1.4	23.1	26.1	0.0	0.9	9.0	31,583
3+ Hang-ups	9.3	0.0	18.3	0.0	48.7	18.4	-	0.6	4.7	15,015
1+ Callbacks	50.3	5.2	5.6	2.7	2.1	7.3	0.0	14.0	12.7	130,281

- Indicates that there were no cases in the cell.

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

The results in Table 7 show:

- The more hang-ups that were received, the less likely the case was to end as an interview and more likely the case was to end as a refusal with maximum hang-ups.
- Once an explicit refusal was obtained, there was at most a 24.6 percent chance of conversion to an interview. Of those converted to an interview, 84.1 percent were complete interviews and 15.9 percent were sufficient partial interviews.
- Callback requests were the easiest type of potential resistance to overcome. Interviewers converted about half of the callback requests to interviews and resolved into “Other (Noninterview)” 14.0 percent of the callbacks (the majority were insufficient partial interviews) and “Other (Ineligible)” an additional 12.7 percent.

Table 8 contains the median¹¹ number of calls, by final CATI outcome, needed to obtain the first resistance (whether the first resistance was an explicit refusal, hang-up, or callback request) and the median number of additional calls needed to resolve the case.

¹¹ Medians were used instead of means, as they provide a more robust measure of the typical call count, especially since some of the distributions (1 explicit refusal and 1-3 hang-ups distributions in particular) were left skewed.

Table 8. Median Number of CATI Calls until First Resistance (FR) and Median Number of Additional Calls After First Resistance to Final CATI Outcome

Final CATI Outcome	FR = Explicit Refusal		FR = Hang-up		FR = Callback	
	Calls Until FR	Additional Calls	Calls Until FR	Additional Calls	Calls Until FR	Additional Calls
Interview	2	3	2	5	2	3
Refusal (2 explicit)	2	2	2	6	2	7
Refusal (mix explicit/implicit)	2	2	2	7	2	9
Refusal (1 explicit)	6	14	4	18	3	19
Refusal (maximum (4) hang-ups)	N/A	N/A	2	8	2	12
Refusal (1-3 hang-ups)	N/A	N/A	6	16	3	20

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

For example, for cases whose first refusal was an explicit refusal and ended as an interview, it took a median of two calls to get the refusal and a median of three additional calls to resolve the case as an interview. Cases with final outcomes of an interview or two explicit refusals did not require as many calls as other final outcome categories. Cases that only gave one explicit refusal or 1-3 hang-ups seemed to be avoiding the CATI calls resulting in the call limit being reached or the CATI month ending. As seen in Table 5, roughly 80 percent of cases in each of these outcomes were resolved in 20 or more calls with 60 percent reaching 25 calls (the call maximum for cases contacted at least once).

In general, if resistance occurred, it occurred quite early in the CATI cycle (around the second or third call for nearly all categories). After this first resistance, cases were either resolved quickly (about 2-9 additional calls), ran the course of CATI (14-20 additional calls), or reached the end of the CATI month.

There are a few conclusions that can be drawn from this analysis about using information obtained during CATI to determine the rest of the path through CATI.

- Very few interviews are obtained after three hang-ups have occurred (9.3 percent), so perhaps the hang-up limit could be lowered to three.
- Once an explicit or implicit refusal occurs, cases are either resolved with an interview or second refusal quickly (in about 2-9 additional calls), or they reach the CATI call limit or the end of the CATI month. This finding seems to support the suggestion to reduce the maximum number of CATI calls as mentioned in Section 4.1.

4.3. What percent of final CATI refusals are selected for CAPI? How effective are the current CAPI efforts in obtaining an ACS interview? What is the distribution of the number of contacts by final CAPI outcome? Should procedures in CAPI differ depending on the final CATI outcome?

To answer these research questions, we looked at the paradata at the end of CAPI. Specifically, we looked at the final CAPI outcome and how many contacts it took to obtain the final outcome. Note that we cannot analyze CAPI contacts in the same way that we analyzed CATI

calls. Whereas the cost and effort of a CATI call attempt is more consistent across cases, CAPI contacts range from a rural personal visit requiring considerable travel time to an urban personal visit requiring less travel time to a telephone call that requires little interviewer time. Furthermore, the number of CAPI contacts is not limited; instead, interviewers are given an allocation of hours to complete their monthly assignments which means they may have to limit their work on some cases to stay within their monthly allocation.

We sample noninterviewed households for CAPI at an overall rate of roughly 1 in 3 households, independent of CATI final outcomes. Table 9 contains the percent of cases selected for CAPI for each of the CATI final outcomes as well as cases that were not included in CATI due to missing phone numbers (Not in CATI–Unmailable and Not in CATI-Mailable).

Table 9. Percent of Cases Selected for CAPI by Final CATI Outcome

Final CATI Outcome	Percent
Not In CATI-Unmailable ¹²	63.7
Not In CATI-Mailable ¹³	36.4
Refusal (2 explicit)	27.7
Refusal (mix explicit/implicit)	30.7
Refusal (1 explicit)	29.2
Refusal (maximum hang-ups)	34.3
Refusal (1-3 hang-ups)	32.4
Reached call max	32.1
Other (Noninterview)	30.4
Other (Ineligible)	32.8
Total CAPI Cases	497,617

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Table 10 displays the distribution of final CAPI outcomes, as defined in Section 2.2, including and excluding Type C noninterview cases (addresses under construction, demolished, etc.), which are considered out of scope in the ACS. Overall, CAPI interviewers were very successful at obtaining interviews. Excluding Type C noninterview cases, CAPI had an interview rate of over 95 percent.

Table 11 contains the distribution of CAPI contacts needed to resolve a case as an interview, Type A refusal, Other Type A noninterview, or Type C noninterview.

¹² Not in CATI Unmailable cases are sampled units for which we did not have a complete address that would allow for mail delivery.

¹³ Not in CATI Mailable cases are sampled units for which we did not have a phone number so they were excluded from the CATI operation (after not responding by mail).

Table 10. Distribution of CAPI Cases by Final CAPI Outcome

Final CAPI Outcome	Percent	Percent (excluding Type C)
Interview	87.9	95.5
Type A Refusal	2.1	2.3
Other Type A (unable to locate, nobody home, etc.)	2.1	2.3
Type C (under construction, demolished, etc.)	8.0	-
Total	497,617	458,011

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Table 11. Distribution of Total Number of Contacts for Each Final CAPI Outcome

Total Number of CAPI contacts	Final CAPI Outcome							
	Interview		Type A Refusal		Other Type A Noninterview		Type C Noninterview	
	%	Cuml. %	%	Cuml. %	%	Cuml. %	%	Cuml. %
1	37.7	37.7	4.8	4.8	7.6	7.6	57.3	57.3
2	26.4	64.1	8.8	13.6	8.8	16.4	28.4	85.7
3	13.7	77.8	11.7	25.3	9.6	26.0	8.3	93.9
4	7.9	85.6	11.5	36.8	10.5	36.5	3.1	97.0
5	4.8	90.5	11.5	48.3	10.1	46.7	1.3	98.3
6	3.1	93.5	10.4	58.7	9.4	56.1	0.6	98.9
7	2.0	95.6	8.0	66.7	8.6	64.7	0.4	99.4
8	1.3	96.9	6.8	73.6	7.0	71.7	0.2	99.6
9	0.9	97.8	5.4	79.0	6.2	77.9	0.1	99.7
10	0.6	98.4	4.6	83.6	4.6	82.5	0.1	99.8
11	0.4	98.9	3.9	87.5	3.9	86.4	0.0	99.9
12	0.3	99.2	2.6	90.0	2.8	89.2	0.1	99.9
13	0.2	99.4	2.0	92.0	2.3	91.4	0.0	99.9
14	0.2	99.6	1.6	93.6	1.9	93.3	0.0	100.0
15	0.1	99.7	1.6	95.2	1.6	94.9	0.0	100.0
16	0.1	99.7	1.1	96.3	1.1	95.9	0.0	100.0
17	0.1	99.8	0.7	97.1	0.8	96.7	0.0	100.0
18	0.0	99.8	0.6	97.7	0.7	97.4	0.0	100.0
19	0.0	99.9	0.4	98.1	0.6	98.0	-	100.0
20	0.0	99.9	0.3	98.4	0.5	98.4	0.0	100.0
21	0.0	99.9	0.4	98.8	0.3	98.7	0.0	100.0
22	0.0	99.9	0.2	99.0	0.3	99.0	-	100.0
23	0.0	99.9	0.2	99.2	0.3	99.3	-	100.0
24	0.0	100.0	0.1	99.3	0.1	99.3	0.0	100.0
25+	0.0	100.0	0.7	100.0	0.7	100.0	-	100.0
Total (n)	437,210		10,368		10,433		39,606	

- Indicates that there were no cases in the cell.

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Not surprisingly, interviewers were able to quickly make the determination of Type C noninterviews, generally taking only one to three contacts. More than 90 percent of interviews were obtained in the first five contacts, and an additional eight percent in the next five contacts. Refusals and Other Type A Noninterviews took the longest to resolve, with up to twelve contacts needed to obtain about a 90 percent resolution rate.

Table 12 shows the median number of contacts to obtain each final CAPI outcome for cases not in CATI and each final CATI outcome excluding final CATI outcomes of Other (Ineligible) and Other (Noninterview)¹⁴.

Table 12. Median Number of CAPI Contacts to Final CAPI Outcome by Final CATI Outcome

Final CATI Outcome	Final CAPI Outcome			
	Interview	Type A Refusal	Other Type A Noninterview	Type C Noninterview
Not In CATI-Unmailable	1	4	3	1
Not In CATI-Mailable	2	6	6	1
Refusal (2 explicit)	2	4	5	1
Refusal (mix explicit/implicit)	2	5	5	1
Refusal (1 explicit)	2	5	5	1
Refusal (maximum hang-ups)	2	5	5	2
Refusal (1-3 hang-ups)	2	6	6	1
Reached call max	2	6	7	1

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

The data in this table support the findings in Table 11 that Type C noninterviews were resolved very quickly, interviews took a little longer, and refusals and Other Type A noninterviews took much longer. These results generally did not depend on the outcome of CATI, with the exception of the Not in CATI-Unmailable. We see that these cases that had not been contacted before either through mail or by telephone required fewer visits in nearly all categories.

Because Type C cases are considered out of scope in the ACS, they are excluded from Tables 13, 14, and 15 so that the CAPI efforts to secure an interview are not masked in this analysis.

¹⁴ We exclude these groups from the CAPI analysis since over 95% of cases in this group were unreachable in CATI so there was little opportunity for harassment by CATI interviewers.

Table 13 shows the distribution of final CAPI outcomes for each final CATI outcome.

Table 13. Final CAPI Outcome by Final CATI Outcome

Final CATI Outcome	Final CAPI Outcome			Count (n)
	Interview (%)	Refusal (%)	Type A Noninterview (%)	
Not In CATI-Unmailable	97.8	0.8	1.4	48,939
Not In CATI-Mailable	95.5	2.1	2.4	225,673
Refusal (2 explicit)	85.9	11.2	2.9	4,788
Refusal (mix explicit/implicit)	91.3	6.3	2.4	5,054
Refusal (1 explicit)	89.1	7.5	3.4	2,152
Refusal (maximum hang-ups)	92.9	4.6	2.6	2,459
Refusal (1-3 hang-ups)	92.2	4.6	3.2	6,951
Reached call max	93.5	3.3	3.1	19,656
Overall	95.4	2.3	2.3	315,672

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

We see from Table 13 that CAPI interviewers are very good at obtaining an interview with around 89 percent or higher interview rates for all final CATI outcomes except “Refusal (2 explicit).” This group may warrant a change in CAPI procedures since 11.2 percent also ended as a final refusal in CAPI.

4.4. When CAPI resistance first occurs, how effective are additional contact attempts?

To answer this question, we focused on cases where the respondent had given some reluctance in CAPI to see how successful later attempts are at obtaining an interview. These data may be useful in determining a course of action after a trigger event in CAPI while CAPI is still ongoing. We examined the following specific trigger events occurs in CAPI: receiving a coded refusal (the intermediate outcome was coded as a refusal) and indicating a reluctance reason (the case was not coded as a refusal but reluctant reasons were given). Note that at the end of every contact in CAPI, interviewers are asked to note any concerns, behaviors, or reluctance demonstrated or voiced by the respondent. This may lead to an over-estimate of the actual reluctance of respondents in this analysis.

Tables 14 and 15 show the distribution of final CAPI outcomes (by final CATI outcome) for cases with at least one coded refusal or only reluctance reasons, respectively. The tables are mutually exclusive; that is, the cases with both coded refusals and reluctance reasons (there are 5,273) are only included in Table 14 (not Table 15). About 75 percent of CAPI cases (excluding Type C cases) are not included in one of these tables indicating that interviewers were not aware of, did not observe, or did not record any resistance to being interviewed for the majority of respondents.

Table 14. Final CAPI Outcome for Cases with at Least One Coded Refusal in CAPI by Final CATI Outcome

Final CATI Outcome	Final CAPI Outcome			Count (n)
	Interview (%)	Refusal (%)	Type A Noninterview (%)	
Not In CATI-Unmailable	26.8	66.2	6.9	317
Not In CATI-Mailable	28.6	63.5	7.9	3,760
Refusal (2 explicit)	20.2	73.3	6.5	475
Refusal (mix explicit/implicit)	26.1	67.8	6.1	295
Refusal (1 explicit)	18.3	72.5	9.2	131
Refusal (maximum hang-ups)	25.3	69.0	5.7	87
Refusal (1-3 hang-ups)	23.5	71.7	4.8	251
Reached call max	23.9	68.4	7.7	506
Overall	26.8	65.8	7.5	5,822

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Table 15. Final CAPI Outcome for Cases with Only Reluctance Reasons in CAPI by Final CATI Outcome

Final CATI Outcome	Final CAPI Outcome			Count (n)
	Interview (%)	Refusal (%)	Type A Noninterview (%)	
Not In CATI-Unmailable	97.2	1.5	1.3	6,074
Not In CATI-Mailable	94.6	2.7	2.7	51,635
Refusal (2 explicit)	91.1	6.4	2.5	2,245
Refusal (mix explicit/implicit)	92.9	4.4	2.7	2,051
Refusal (1 explicit)	92.1	5.6	2.3	913
Refusal (maximum hang-ups)	92.3	4.4	3.3	903
Refusal (1-3 hang-ups)	94.0	3.6	2.5	2,417
Reached call max	93.4	3.4	3.2	5,416
Overall	94.5	2.9	2.6	71,654

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Table 14 shows that, among cases in the CATI refusal categories, 18 to 26 percent of those with at least one coded CAPI refusal were converted to an interview (either complete or sufficient partial). Note that once an interviewer assigns a coded refusal, the Regional Office decides the next course of action for a case. Among the possibilities are continuing with the same interviewer, switching interviewers, or discontinuing the case in CAPI. About 42 percent of all cases with at least one coded refusal were not contacted after the coded refusal.

As shown in Table 15, cases with at least one reluctance reason had interview conversion rates over 91 percent for all final CATI outcome categories. The difference between the interview rates for coded refusals and cases with only reluctance reasons is partially due to the 42 percent of coded refusal cases not contacted after the refusal and not having a chance to be converted to an interview.

Table 16 shows the median number of CAPI contacts until the first reluctance (either coded refusal or reluctance reason) and the median number of additional contacts needed to obtain the final outcome of an interview or a final refusal. This is shown for each final CATI outcome, as well as for mailable and unmailable cases not in CATI.

Table 16. Median Number of CAPI Contacts to First Resistance and Median Number of Additional Contacts to Interview or Final Refusal by Final CATI Outcome

Final CATI Outcome	First Resistance = Coded Refusal (CR)				First Resistance = Reluctance Reason (RR)			
	Final CAPI Outcome				Final CAPI Outcome			
	Interview		Refusal		Interview		Refusal	
	Contacts Until CR	Additional Contacts	Contacts Until CR	Additional Contacts	Contacts Until RR	Additional Contacts	Contacts Until RR	Additional Contacts
Not In CATI-Unmailable	2	2	3	0	2	0	2	2
Not In CATI-Mailable	3	2	4	0	2	1	2	3
Refusal (2 explicit)	2	1	2	0	1	0	1	2
Refusal (mix explicit/implicit)	2	1.5	2	0	1	1	1	3
Refusal (1 explicit)	2.5	2	3	0	2	0	2	3
Refusal (maximum hang-ups)	1	2	3	0	2	1	2	3
Refusal (hang-ups)	4.5	2	4	0	2	1	2	4
Reached call max	4	2	5	0	2	1	2	3

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

The data in Table 16 show the following:

- The median of zero for the number of additional contacts after a coded first refusal to a final refusal is due to a large percentage of these cases (63.4 percent) being closed out by the Regional Office after the first coded refusal.
- A reluctance reason first occurred in 1 to 2 contacts while it took 1 to 4.5 contacts to get a first coded refusal. Two possibilities for this finding are 1) interviewers may try to avoid a coded refusal because then the case is sent to the Regional Office to determine if additional visits should be attempted and 2) the reluctance reason may not always indicate true resistance since the interviewer must answer the resistance question for every contact with a respondent. Note the medians of zero additional calls after a reluctance reason to a final interview supports this second possibility.
- After a reluctance reason was given, it took a median of 2 to 4 additional contacts to resolve a case as a refusal and a median of 0 to 1 additional contacts for an interview. This seems to indicate that interviewers are trying to overcome resistance and do not want to give up on the case too quickly.

In general, CAPI interviewers are very successful at getting cooperation: 95.5 percent of CAPI cases (excluding Type C noninterviews) end as interviews. For cases that showed some resistance (with only reluctance reasons), the interview rate is 94.5 percent. Cases with at least one coded refusal were interviewed 26.8 percent of the time (65.8 percent ended as refusals) most likely due to the 42 percent of cases who indicate their reluctance strongly enough to be coded as a refusal being closed out by the Regional Office. This means that we are not harassing those respondents after a refusal. However, the rules for when the Regional Office closes out a case are subjective. We may need to look at the rules more closely to see if the procedures need clarification to ensure that we are enforcing the same STOP policies across managers.

4.5. What are the main reasons for respondent refusal and reluctance in the CATI and CAPI modes?

To answer this research question, we looked at the reasons that participants gave for refusing or resisting completing the survey in CATI and CAPI. It should be noted that sometimes the respondent does not state the exact refusal or reluctance reason; rather it is up to the interviewer to interpret the respondent's words and behavior to select a reason. As mentioned in Section 3.2.1, CAPI interviewer notes were not coded so these reasons are only based on the 24 response categories available to the interviewers.

Table 17 contains the distribution of refusal reasons for CATI. Only one refusal reason was given per phone call. A household could have at most two refusal reasons and all refusal reasons were included in the table (i.e., a household can be in this table up to two times and maybe with duplicate refusal reasons). The table also gives the percent of cases with each refusal reason that are converted to an interview in CATI and CAPI (for those sampled for CAPI).

Table 17. Distribution of CATI Refusal Reasons

CATI Refusal Reason	Frequency	Percent of total refusal reasons	Percent converted to CATI interview	Percent (of sampled) converted to CAPI interview
Refused to give info over the phone	23,344	75.0	20.4	87.5
Respondent questioned legitimacy of the survey	3,033	9.7	23.6	80.8
Respondent too busy	2,924	9.4	24.7	89.1
Interview too long	999	3.2	49.5	89.9
Survey is a waste of taxpayer money	635	2.0	22.4	71.1
Contacted Congressional Representative	209	0.7	16.3	74.3
Total Households	28,007			

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

The most common refusal reason given during CATI was that the respondent did not want to provide information over the phone. Only 20.4 percent of the times this reason was given did an CATI interview result. The next two most frequently provided refusal reasons were concerns

about the legitimacy of the survey (and possibly privacy) and the respondent not having time to complete the interview. Interestingly, almost 50 percent of the time when the reason was that the interview was too long, an interview did result. This may indicate that the respondent answered enough questions to be a sufficient partial interview but got tired or distracted and did not want to finish the survey.

If we look at what happened to CATI cases sampled for CAPI (the last column in Table 17), we see that CAPI interviewers were able to overcome the majority of CATI refusal reasons and secure an interview. CATI refusal cases where respondents said they were too busy or indicated that the survey was too long, were converted to CAPI interviews about 89 percent of the time. For cases in both CATI and CAPI, when the recorded CATI refusal reason was that the respondent did not want to complete the survey over the telephone, interviewers were able to conduct a CAPI interview 87.5 percent of the time. This may be an indication of the respondent's mode preference.

As mentioned earlier, CAPI interviewers were asked to note any concerns, voiced or demonstrated, by respondents at each contact. For this analysis, we grouped the CAPI reluctance reason codes into the five categories shown in Table 18.

Table 18. CAPI Reluctance Reason Categories

Reluctance Reason Categories	Scheduling	Scheduling difficulties, too busy, interview takes too much time, breaks appointments (puts off interviewer indefinitely)
	Privacy	Privacy concerns, survey is voluntary, anti-government concerns, does not understand survey/asks questions about the survey
	Firm	Not interested/does not want be bothered, Hang-up/slams door, hostile or threatening
	Gatekeeping	Other household members tell respondent not to participate, talk only to specific household member, family issues
	Other	Other write-in reasons (not coded for this analysis)

Unlike CATI, CAPI interviewers could select multiple reluctance reasons per contact. In order to avoid households with multiple visits and multiple reluctance reasons overwhelming the distribution of reluctance reasons, Table 19 contains the distributions of CAPI reluctance reasons for the first three contacts where resistance was recorded. Note that the rows in this table were ordered by descending frequency of the CAPI reluctance reasons at Contact 1. Privacy and scheduling (respondent busy) are the main reluctance reasons given in CAPI, regardless of contact number.

Table 19. Distribution of CAPI Reluctance Reasons at the First Three Contacts with Resistance

CAPI Reluctance Reason	Contact 1		Contact 2		Contact 3	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Privacy	65,931	36.1	20,363	33.9	6,453	32.0
Scheduling	49,784	27.3	17,227	28.7	6,023	29.8
Other	33,254	18.2	8,879	14.8	2,642	13.1
Firm	25,185	13.8	10,561	17.6	4,017	19.9
Gatekeeping	8,516	4.7	2,979	5.0	1,057	5.2
Total Households	114,054		32,852		10,203	

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

To determine if cases with coded CAPI refusals and those with only reluctance reasons had the same concerns about responding to the ACS, we looked at each distribution of CAPI reluctance reasons at the first contact with resistance separately for cases with at least one coded refusal and cases with only reluctance reasons. Note that we list the reluctance reason categories separately from highest to lowest frequency for cases with coded refusals and those with only reluctance reasons.

Table 20. Distribution of CAPI Reluctance Reasons by Refusal Type at First Contact with Resistance

Coded Refusal			Only Reluctance Reason		
Reason	Frequency	Percent	Reason	Frequency	Percent
Firm	4,371	32.7	Privacy	61,894	36.6
Privacy	4,037	30.2	Scheduling	47,472	28.0
Scheduling	2,312	17.3	Other	31,022	18.3
Other	2,232	16.7	Firm	20,814	12.3
Gatekeeping	427	3.2	Gatekeeping	8,089	4.8
Total Households	6,777		Total Households	107,277	

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata, June 2011 to February 2012

For the coded refusals, firm and privacy reasons were the reasons most often given. Firm reasons including “not interested,” “hang-up,” “slams door,” and “threatens interviewer” are expected since these cases were coded as refusals. Cases with only reluctance reasons only cited privacy most often, followed by scheduling. The findings in Table 19 are driven by the fact that there are over 10 times more cases with only reluctance reasons than with a coded refusal. The 12.3 percent of cases with a “firm” reluctance reason but no coded refusal suggests further review of interviewer procedures and instructions since these cases, by definition, should be coded as a refusal not just reluctance.

Next, we examined whether the overall CATI experience affected the reluctance reasons given during CAPI. Table 21 contains the distribution for CAPI reluctance reasons for the first CAPI contact with resistance by CATI inclusion status. There are four CATI inclusion statuses presented: those that went through CATI, those that were not in CATI (overall), those that were not in CATI and did not receive the mailings in month 1 (CAPI is the first contact with these

households) and those that were not in CATI but received the mailings in month 1. From Table 21, it appears that CATI inclusion status did not influence reasons given for CAPI resistance since the ordering of the distributions is the same for all four statuses. For households never contacted prior to CAPI (Not in CATI-Unmailable), privacy was more of a concern for this group compared to the other groups. This seems intuitive since they have no prior contact about the ACS.

Table 21. CAPI Reluctance Reasons by CATI Inclusion Status for the First CAPI Contact with Resistance

CAPI Reluctance Reason	In CATI		Not in CATI		Not in CATI-Unmailable		Not in CATI-Mailable	
	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent
Privacy	30,701	36.0	35,230	36.2	4,334	41.7	30,896	35.5
Scheduling	22,988	27.0	26,796	27.5	2,359	22.7	24,437	28.1
Other	15,294	17.9	17,960	18.4	2,023	19.5	15,937	18.3
Firm	12,171	14.3	13,014	13.4	1,239	11.9	11,775	13.5
Gatekeeping	4,129	4.8	4,387	4.5	428	4.1	3,959	4.6
Total Households with Resistance	52,102		61,952		6,546		55,406	

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Table 22 provides the CAPI reluctance reasons for cases that gave a refusal in CATI (either explicitly or implicitly) or were reached the CATI call maximum to examine whether knowing the outcome of CATI influences the rankings of CAPI reluctance reasons.

Table 22. CAPI Reluctance Reasons at the First Contact with Resistance for Explicit CATI Refusals, Implicit CATI Refusals and Cases that Reached Call Maximum

CAPI Reluctance Reason	Explicit CATI Refusals		Implicit CATI Refusals		CATI Call Maximum Reached	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Privacy	5,050	41.5	2,066	34.8	3,616	37.4
Firm	2,393	19.7	913	15.4	1,355	14.0
Other	2,169	17.8	1,046	17.6	1,645	17.0
Scheduling	2,023	16.6	1,554	26.2	2,643	27.3
Gatekeeping	526	4.3	358	6.0	420	4.3
Total Households with Reluctance Reasons	6,064		3,625		9,679	

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Privacy concerns topped the list for all three groups while gatekeeping concerns were the least prevalent. In general, privacy seems to be a key concern among both CATI and CAPI respondents. It may be worth focusing future research efforts on ways to revise contact strategies, messaging, and interviewer instructions and materials to alleviate respondent concerns.

5. SUMMARY

CATI interviewers were able to obtain interviews with 51.4 percent of the cases that had a valid phone number, while 19.5 percent ended as refusals, contact continued for 17.1 percent until the maximum number of calls was reached, and 12.1 ended as other noninterviews.

Interviewers were successful at obtaining an interview after a household's request for the interviewer to call back, but that rate decreased with the presence of an outright refusal or hang-up. With three immediate hang-ups, the possibility of an interview was only 9.3 percent. In general, if resistance by respondents did occur, the first resistance occurred rather quickly (median of 2-3 calls). After that, the case was resolved with a moderate amount of follow-up calls (median of 2-9 additional calls) or the case continued in CATI until reaching the call maximum (20 or 25 total calls). Taken together, these results indicate that the hang-up limit and the call maximum number could be lowered.

Overall, CAPI interviewers are very successful at gaining respondent cooperation: 95.5 percent of CAPI cases (excluding Type C noninterviews) ended as an interview. Those who gave two explicit refusals in CATI refused in CAPI at the rate of 11.2 percent. More than 90 percent of CAPI interviews were obtained in the first five contacts, and an additional 8 percent in the next five contacts. Refusals and Other Type A noninterviews took the longest to resolve, with up to twelve contacts needed to obtain a 90 percent resolution rate. It is difficult to define CAPI in terms of maximum number of contacts, as interviewers balance their monthly workload allocation among all assigned cases, not a predetermined number of contacts. About 42 percent of respondents who indicate their reluctance strongly enough to be coded as a refusal during CAPI are closed out by the Regional Office after that one refusal which means we are not bothering those respondents anymore. However, the rules for when the Regional Office closes out a case are subjective. We may need to look at the rules more closely to see if the procedures need clarification to ensure that we are enforcing the same STOP policies across managers.

The most commonly cited refusal reason during CATI was that the respondent did not want to provide information over the phone. This was followed by concerns about the legitimacy of the survey (and possibly privacy) and the respondent not having time to complete the interview. Only two thirds of cases with one explicit refusal had a refusal reason code in CATI, which may indicate a need to retrain CATI interviewers and reiterate the importance of the paradata they collect. CAPI interviewers were able to overcome the majority of CATI refusal reasons and secure an interview, especially when the CATI reason indicated that the respondent did not want to complete the survey over the telephone. This seems to be an indication of mode preference by the respondent and may support closing the case in CATI earlier using a mode switch to CAPI.

According to interviewers, only 25 percent of CAPI respondents demonstrated or voiced some type of reluctance and among them only seven percent were coded refusals. For the coded refusals, firm reasons including "not interested," "hang-up," "slams door," and "threatens

interviewer,” as well as privacy concerns were the most often cited. The cases with only reluctance reasons indicated privacy most often followed by scheduling.

6. NEXT STEPS

This research is intended to be a preliminary examination of the paradata produced from the telephone and in-person interview modes. There are several more characteristics that we can study with regard to interviewer-assisted modes, such as urban/rural status, phone type (landline/cell phone), the day/time of interview attempt, or some type of cost measure. Additional research should include examining the number of contacts necessary to obtain a sufficient partial interview especially when resistance is present, the quality of the data obtained from an interview or partial interview after some type of resistance is observed, ways to alleviate respondent privacy concerns, ways to address respondent mode preference, as well as the demographics of the respondent.

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References

McGuckin, Nancy, Santos, Adella, and Liss, Susan (2001) “Hang-ups-Looking at Non-Response in Telephone Surveys,” Federal Highway Administration, U.S. Department of Transportation, http://www.fhwa.dot.gov/ohim/hang_ups.htm.

Yammarino, Francis J., Skinner, Steven J., and Childers, Terry L. (1991), “Understanding Mail Survey Response Behavior: A Meta-Analysis,” *The Public Opinion Quarterly*, Vol. 55, No. 4, pp. 613-639, <http://www.jstor.org/stable/2749409>.

Additional Research on the Effects of Vacant and Temporarily Occupied Units on CATI and CAPI Contact Research

While reviewing some of the final CAPI outcome data in this analysis, we noticed that a large number of interviews (30.6 percent) were of vacant units and others were interviews of temporarily occupied units (0.8 percent). These cases are complete interviews but generally require less data collection effort due to the lack of people in the unit. We wondered if these cases were having an effect on some of the items we were examining. In this appendix, we replicate and reference some of the tables from the main report showing the effects of removing the vacant and temporarily occupied units from the interview columns of the tables.

Number of Contacts to Final CAPI Outcome

First, we looked at the distribution of the total number of contacts for each final CAPI outcome. Table A shows the information from Table 11 in the report and three additional columns, one each for CAPI Interviews excluding vacant and temporarily occupied interviews, only vacant interviews, and only temporarily occupied unit interviews.

We see that about half of the vacant interviews are achieved in one contact and another 28.4 percent were completed in two contacts. About 39 percent of temporarily occupied units were interviewed in one contact. Both of these types of cases appear to have some effect on the overall CAPI interview rate as seen by the lower interview rates among cases that required one or two contacts when the vacant and temporarily occupied interviews are removed from the distribution. While these rates lag behind the interview rates for all cases for the same number of contacts, beginning with three contacts the interview rate is slightly better when excluding the vacant and temporarily occupied units, likely because interviewer efforts are now focused on units where initial contact has been made. It is worth noting that by the sixth contact, CAPI interviewers did close out over 91 percent of the final interviews and, similar to when all cases are included, we still find a cumulative interview rate of 98 percent by contact 10.

Table A. Distribution of Total Number of Contacts for Each Final CAPI Outcome Including and Excluding Vacant and Temporarily Occupied Units

Total Number of CAPI contacts	Final CAPI Outcome													
	All CAPI Interviews		Interviews Excluding Vacant and Temporarily Occupied Interviews		Vacant Interviews		Temporarily Occupied Interviews		Type A Refusals		Other Type A Noninterviews		Type C Noninterviews	
	Cuml. %		Cuml. %		Cuml. %		Cuml. %		Cuml. %		Cuml. %		Cuml. %	
1	37.7	37.7	32.7	32.7	48.8	48.8	38.9	38.9	4.8	4.8	7.6	7.6	57.3	57.3
2	26.4	64.1	25.5	58.2	28.4	77.2	23.2	62.2	8.8	13.6	8.8	16.4	28.4	85.7
3	13.7	77.8	15.1	73.3	10.6	87.7	13.2	75.3	11.7	25.3	9.6	26.0	8.3	93.9
4	7.9	85.6	9.2	82.5	5.0	92.8	8.0	83.3	11.5	36.8	10.5	36.5	3.1	97.0
5	4.8	90.5	5.7	88.2	2.7	95.5	5.6	88.9	11.5	48.3	10.1	46.7	1.3	98.3
6	3.1	93.5	3.7	91.9	1.6	97.1	3.3	92.2	10.4	58.7	9.4	56.1	0.6	98.9
7	2.0	95.6	2.5	94.4	0.9	98.1	2.3	94.5	8.0	66.7	8.6	64.7	0.4	99.4
8	1.3	96.9	1.7	96.1	0.6	98.7	1.3	95.8	6.8	73.6	7.0	71.7	0.2	99.6
9	0.9	97.8	1.2	97.3	0.4	99.1	1.2	97.0	5.4	79.0	6.2	77.9	0.1	99.7
10	0.6	98.4	0.8	98.0	0.3	99.4	1.0	98.0	4.6	83.6	4.6	82.5	0.1	99.8
11	0.4	98.9	0.5	98.6	0.2	99.5	0.7	98.8	3.9	87.5	3.9	86.4	0.0	99.9
12	0.3	99.2	0.4	99.0	0.1	99.7	0.3	99.1	2.6	90.0	2.8	89.2	0.1	99.9
13	0.2	99.4	0.3	99.2	0.1	99.8	0.2	99.3	2.0	92.0	2.3	91.4	0.0	99.9
14	0.2	99.6	0.2	99.4	0.1	99.8	0.2	99.5	1.6	93.6	1.9	93.3	0.0	100.0
15	0.1	99.7	0.1	99.6	0.0	99.9	0.1	99.6	1.6	95.2	1.6	94.9	0.0	100.0
16	0.1	99.7	0.1	99.7	0.0	99.9	0.1	99.7	1.1	96.3	1.1	95.9	0.0	100.0
17	0.1	99.8	0.1	99.8	0.0	99.9	0.1	99.7	0.7	97.1	0.8	96.7	0.0	100.0
18	0.0	99.8	0.1	99.8	0.0	99.9	0.0	99.7	0.6	97.7	0.7	97.4	0.0	100.0
19	0.0	99.9	0.0	99.9	0.0	99.9	0.1	99.9	0.4	98.1	0.6	98.0	-	100.0
20	0.0	99.9	0.0	99.9	0.0	100.0	0.0	99.9	0.3	98.4	0.5	98.4	0.0	100.0
21	0.0	99.9	0.0	99.9	0.0	100.0	0.0	99.9	0.4	98.8	0.3	98.7	0.0	100.0
22	0.0	99.9	0.0	99.9	0.0	100.0	0.0	99.9	0.2	99.0	0.3	99.0	-	100.0
23	0.0	99.9	0.0	99.9	0.0	100.0	0.0	99.9	0.2	99.2	0.3	99.3	-	100.0
24	0.0	100.0	0.0	99.9	0.0	100.0	0.0	99.9	0.1	99.3	0.1	99.3	0.0	100.0
25+	0.0	100.0	0.0	100.0	0.0	100.0	0.1	100.0	0.7	100.0	0.7	100.0	-	100.0
Total (n)	437,210		299,846		133,878		3,486		10,368		10,433		39,606	

- Indicates that there were no cases in the cell.

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Median Number of Contacts to Final CAPI Outcome by Final CATI Outcome

Another item of interest was the median number of contacts needed to close a case. Table B includes data from Table 12 showing the median number of CAPI contacts needed to achieve a final CAPI outcome by final CATI outcome. Additional columns show the median number of contacts for interview excluding vacant and temporarily occupied interviews, for vacant interviews, and for temporarily occupied interviews. Generally, there was no difference in the median number of contacts needed to achieve any type of CAPI interview (the first 4 columns in the table) for any of the final CATI outcome categories. For those cases where CAPI was the first contact (Not in CATI – Unmailable), this was the first opportunity to determine ACS eligibility and, therefore, there were a fair number of cases that could be resolved in one contact.

Table B. Median Number of CAPI Contacts to Final CAPI Outcome by Final CATI Outcome Including and Excluding Vacant and Temporarily Occupied Interviews

Final CATI Outcome	Final CAPI Outcome						
	All CAPI Interviews	Interviews (Excluding Vacant and Temp. Occupied)	Vacant Interviews	Temp. Occupied Interviews	Type A Refusal	Other Type A Nonint.	Type C Nonint.
Not In CATI-Unmailable	1	2	1	1	4	3	1
Not In CATI-Mailable	2	2	2	2	6	6	1
Refusal (2 explicit)	2	2	2	2	4	5	1
Refusal (mix explicit/implicit)	2	2	2	2	5	5	1
Refusal (1 explicit)	2	2	2	2	5	5	1
Refusal (maximum hang-ups)	2	2	2	1	5	5	2
Refusal (1-3 hang-ups)	2	2	2	2	6	6	1
Reached call max	2	2	2	2	6	7	1

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Final CAPI Outcome by Final CATI Outcome

Next, we looked at the final CAPI outcome by final CATI outcome. The left half of Table C shows the data for all CAPI cases from Table 13 and the right half shows the same tabulation after removing the vacant and temporarily occupied interviews. As expected, removing cases from only the interview category reduces the percent of cases in this category while increasing the percent of cases in the others. We see that the percent of interviews in every final CATI outcome category is reduced, and thus the percent of refusals and percent of Other Type A noninterviews are higher. While there are differences, the categories with over 90 percent of interviews when all cases are included, still have over 90 percent interviews when the vacant and temporarily occupied interviews are removed.

Table C. Final CAPI Outcome by Final CATI Outcome Including and Excluding Vacant and Temporarily Occupied Units

Final CATI Outcome	All CAPI				Excluding Vacant and Temporarily Occupied Interviews			
	Final CAPI Outcome				Final CAPI Outcome			
	Interview	Type A Refusal	Other Type A Nonint.	Count (n)	Interview	Type A Refusal	Othe Type A Nonint.	Count (n)
Not In CATI-Unmailable	97.8	0.8	1.4	48,939	95.6	1.5	2.9	24,285
Not In CATI-Mailable	95.5	2.1	2.4	225,673	93.6	3.0	3.4	157,647
Refusal (2 explicit)	85.9	11.2	2.9	4,788	84.6	12.2	3.2	4,386
Refusal (mix explicit/implicit)	91.3	6.3	2.4	5,054	90.5	6.9	2.6	4,629
Refusal (1 explicit)	89.1	7.5	3.4	2,152	87.5	8.6	3.9	1,878
Refusal (maximum hang-ups)	92.9	4.6	2.6	2,459	92.2	5.0	2.8	2,237
Refusal (1-3 hang-ups)	92.2	4.6	3.2	6,951	91.2	5.2	3.6	6,210
Reached call max	93.5	3.3	3.1	19,656	91.5	4.4	4.1	14,899
Overall	95.4	2.3	2.3	315,672	93.3	3.4	3.4	216,171

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

CAPI Reluctance Reasons

Finally, we looked at the distribution of CAPI reluctance reasons at the first sign of resistance (Table 19 in report). Vacant and temporarily occupied units made up a small percentage (5.8 percent) of the households for which a reluctance reason was recorded. This small number did not seem to influence the overall distribution of CAPI reluctance reasons as there is not much difference when we remove them from the distribution as shown in Table D. As previously discussed, privacy and scheduling were the most frequently noted reluctance reasons overall. We do see that privacy concerns were also high for the vacant and temporarily occupied units. However, as expected, reluctance reasons in the “Other” category were the next most frequently cited for these units, as these tend to be reasons that are more related to the unit status rather than respondent concern.

Table D. Distribution of CAPI Reluctance Reasons at the First Contact with Resistance Including and Excluding Vacant and Temporarily Occupied Units

CAPI Reluctance Reason	All CAPI Reluctance Reasons at First Resistance		Reluctance reasons (Excluding Vacant and Temporarily Occupied)		Vacant		Temporarily Occupied	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Privacy	65,931	36.1	62,385	36.1	3,018	36.1	528	38.6
Scheduling	49,784	27.3	48,024	27.8	1,481	17.7	279	20.4
Other	33,254	18.2	30,645	17.7	2,309	27.6	300	21.9
Firm	25,185	13.8	23,662	13.7	1,304	15.6	219	16.0
Gatekeeping	8,516	4.7	8,234	4.8	241	2.9	41	3.0
Total Cases	114,054		107,448		5,743		863	

Source: U.S. Census Bureau, 2012 American Community Survey Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview Paradata Research, June 2011 to February 2012

Summary

In summary, vacant and temporarily occupied interviews make up about one-third of all CAPI interviews. They tend to slightly inflate the overall CAPI interview rates at one or two contacts but interviewers do close out 91 percent of the other interviews within six contacts. Generally, within the final CATI outcome categories there was no difference in the median number of contacts needed to achieve any type of interview. While there is a reduction in the percent of CAPI interviews in every final CATI outcome category when we remove the vacant and temporarily occupied units, the categories with over 90 percent of interviews when all cases are included still have over 90 percent interviews. As seen earlier, privacy is a main concern for everyone. Vacant and temporarily occupied units also cited “Other” reasons while the other interviews generally seemed to be affected by scheduling.

In this limited analysis, we found that interviews of vacant and temporarily occupied units have some differences from other interviews. However, those differences do not appear to have a large enough effect to change the findings of the main analysis in the report. Awareness of the presence of these types of cases and further investigation into their characteristics should be a part of the continuing effort to improve the efficiency of the ACS CATI and CAPI operations.