Simulating Telephone Interview Productivity and Efficiency Based on Early-Round Calling Outcomes: Insights from 2016 American Community Survey Computer-Assisted Telephone Interview Paradata

Gregory J. Mills, U.S. Census Bureau

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Introduction and Background

- The American Community Survey (ACS) is a multi-modal address-based survey by the US Census Bureau, with 2 self-response modes and 2 nonresponse followup modes
- For more information about the ACS, please visit: *https://www.census.gov/acs*
- This research attempts to understand how overall CATI productivity is related to the CATI workload, the progression of CATI callback attempts, and respondent burden
- Continuation of Zelenak and Davis (2013), which brought about several changes to case parameter limits, or *points when a case in CATI is automatically closed out*:

Pre-April 2013	Parameter, or case maximum	Post-April 2013
25	Total Call Max	15
20	Unproductive Call Max	12
4	Immediate Hang-ups	3
3	Refusals	2

- CATI operation has experienced decreasing interview completion rates and interview efficiency over several years
  - Interview efficiency - number of completed CATI interviews per login hour
  - Interview completion rates – unweighted rate of cases culminating in a completed CATI interview
- In 2016, the ACS began using a match-score model that predicts the most likely address/telephone number matches, and sends the top-scored cases to CATI

Research Question 1: How have completion rates and interview efficiency changed in the ACS CATI mode since 2011?

Table 1. ACS CATI Productivity and Efficien
Changes, 2011-2016

	2011	2016	% C
Completion Rate	20.7%	8.6%	-
Interviews per Hour	0.77	0.46	-

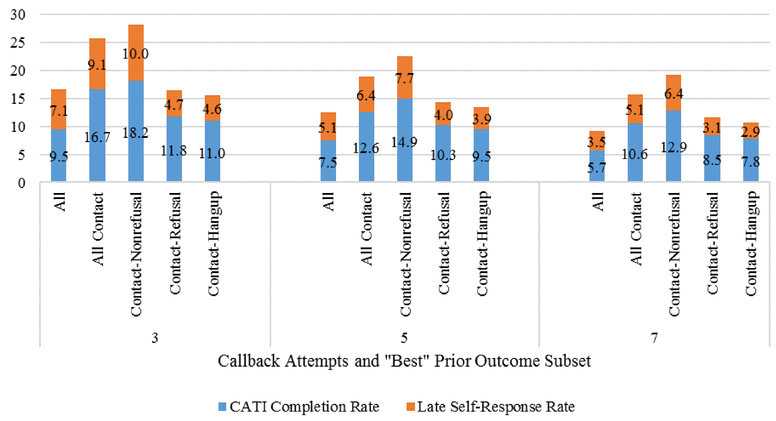
Source: US Census Bureau, 2011, 2016 AC
CATI Paradata

- Both CATI completion rates and efficiency have fallen substantially in recent years
- Some drop was expected with 2013 parameter changes, but not to such an extent
- Completion rates have fallen in every state by at least 35 percent
- More densely populated areas appear to have fallen more dramatically

Note: Map only shows counties with at least 10 ACS CATI cases in 2011 and 2016
Sources: 2011 and 2016 ACS CATI Paradata, 2015 1 year ACS

Research Question 2: Does making early contact induce completing a CATI interview or obtaining a late self-response?

Figure 2. CATI Completion and Late Self-Response Rates, after Specified Number of Callback Attempts, by "Best" Prior Outcome



- Early round contact predictive of later interviews and late self-response
- 70% higher CATI completion rate when contact is made in 5 callback attempts, 90% if contact in 7 attempts, compared to all cases
- Nonrefusal contact doubles the likelihood of later CATI interview, higher late self-response
- Higher completion rate also for early refusals and hangups, compared to all cases

Research Question 3: What are the efficiency and productivity changes associated with changing the maximum number of callback attempts and the CATI workload size?

Table 2. Percent Change in Productivity and Efficiency with Parameter and Workload Changes

Unprod. Call Max	Total Call Max	Workload of 95,000 Interviews	Workload of 95,000 Interview Efficiency	Workload of 70,000 Interviews	Workload of 70,000 Interview Efficiency	Workload of 60,000 Interviews	Workload of 60,000 Interview Efficiency	Workload of 50,000 Interviews	Workload of 50,000 Interview Efficiency
12	15	0.0%	0.0%	-6.3%	14.1%	-10.6%	20.7%	-17.1%	28.2%
9	11	-8.5%	4.5%	-14.1%	19.3%	-18.1%	26.1%	-24.0%	33.8%
	9	-12.4%	4.4%	-17.8%	19.6%	-21.6%	26.4%	-27.2%	34.2%
7	9	-14.8%	8.8%	-20.1%	24.1%	-23.7%	31.2%	-29.2%	39.2%
	7	-20.2%	8.0%	-25.1%	23.6%	-28.5%	30.9%	-33.6%	39.1%
5	7	-24.2%	13.8%	-28.8%	29.9%	-32.0%	37.4%	-36.8%	45.7%
	5	-31.5%	12.0%	-35.6%	28.5%	-38.4%	36.3%	-42.7%	44.9%

Source: US Census Bureau, March - August 2016 ACS CATI Paradata

- Table 2 looks at tradeoffs between efficiency and productivity
- Efficiency is gained by reducing the call max
  - 8.0 % increase with 7 call max
  - 8.8 % with 7 unproductive, 9 total call max
- Also causes reduction in productivity
  - 14.8 – 20.2 % reduction with 7 total call max, or 7 unproductive and 9 total call max
- Overall, with only reducing call max, larger reduction in productivity compared to increases in efficiency, but also greatly reduces potential for respondent burden
- Restricting the caseload to the highest ranked cases based on an address-match score also improves efficiency
  - 20.7 % increase in efficiency reducing workload to 60,000 from 95,000
  - 10.6 % reduction in productivity
- Mixing reductions in workload and callback attempts combines the increases in efficiency and reduction in respondent burden
- Allowing extra attempts to cases that have made early contact lessens impact on productivity without lowering efficiency

Conclusions

- Productivity and efficiency in the ACS CATI operation have decreased substantially over the past few years, completion rates decreasing by at least 35 percent in every state
- Making contact with the sample unit in early callback rounds is predictive of a later completed interview or late self-return
- When gauging the overall effect of reducing callback attempts or the CATI workload, we found there to be a tradeoff between reducing productivity and increasing efficiency
- Reducing callback attempts lessens potential respondent burden and increases efficiency, but also decreases productivity substantially
- Using a combination of reducing callback attempts and the workload can reduce potential respondent burden and lessen the impact on productivity, while also boosting efficiency

References

Mills, G. (2016). Simulated Effects of Changing Calling Parameters and Workload Size on Computer Assisted Telephone Interview Productivity in the American Community Survey. 2016 American Community Survey Research and Evaluation Report Memorandum Series #ACS16-RER-22.

Zelenak, M. and Davis, M. (2013) Impact of Multiple Contacts by Computer-Assisted Telephone Interview and Computer-Assisted Personal Interview on Final Interview Outcome in the American Community Survey. 2013 American Community Survey Research and Evaluation Report Memorandum Series #ACS13-RER-08.

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