

Assessing the Effect of Different Instrument Modes on Reinterview Results from the Consumer Expenditure Quarterly Interview Survey ¹

Angela-Jo Wetzel

U.S. Census Bureau, 4700 Silver Hill Road, Washington D.C. 20233-1912

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1.0 Background

1.1 Survey Overview

The Consumer Expenditure Survey is an on-going monthly survey conducted by the U.S. Census Bureau for the U.S. Bureau of Labor Statistics. The survey began in October 1979. Its purpose is to provide current and continuous series of data on consumer expenditures and other related characteristics. The Consumer Expenditure Survey consists of two components: The Quarterly Interview (CEQ) Survey and the Diary (CED) Survey. For the CEQ Survey, interviewers or field representatives (FRs) visit and interview each sample unit five times, once per quarter over 13 consecutive months. The CEQ Survey obtains data on large expenditures and those which occur on a fairly regular basis. For the CED Survey, FRs visit and ask the sample units to keep two one-week diaries for recording all purchases. The CED Survey provides data on those items not covered in detail in the CEQ Survey. Prior to April 2003, both components of the Consumer Expenditure Survey used a paper control card and either a paper questionnaire (CEQ) or a paper diary (CED).

1.2 CEQ Instrument Mode Conversion

The CEQ Survey converted from a paper questionnaire or PAPI survey to an automated questionnaire on a laptop or computer assisted personal interview (CAPI) survey in April 2003. Likewise, the CEQ Reinterview converted from PAPI to CAPI. To prepare for this conversion, a CEQ CAPI dress rehearsal took place from January through September 2002, with reinterview participating from March through September 2002. For seven months the CEQ survey had both a PAPI reinterview, as part of its regular production, and a CAPI reinterview, as part of the dress rehearsal, in the field at the same time.

The simultaneous occurrence of the CEQ CAPI and PAPI reinterviews allowed us the opportunity to compare certain reinterview results

between the two instrument modes. This paper compares the following:

- reinterview response rates,
- average lag times from original interview to reinterview,
- suspected falsification rates,
- noninterview misclassification rates, and
- household roster discrepancy rates.

2.0 Summary of Results

Our comparison of the CEQ CAPI and PAPI reinterviews showed the following results between the two instrument modes to be significantly different at the $\alpha = .10$ level:

- reinterview response rates,
- average lag times from original interview to reinterview, and
- household roster discrepancy rates.

There was no evidence of differences in the following reinterview results between the CAPI and PAPI instrument modes:

- suspected falsification rates and
- noninterview misclassification rates.

Details and discussions of these results are in Section 4.0, Results and Discussion, below.

3.0 Methodology

3.1 CEQ CAPI and PAPI Reinterviews

The CEQ CAPI dress rehearsal reinterview and the CEQ PAPI production reinterview were quality control (QC) reinterviews. Their primary purpose was to identify FRs who falsified data or who incorrectly followed procedures. Supervisory field representatives (SFRs) performed both the CAPI and PAPI reinterviews. They conducted these reinterviews by telephone, and, if a telephone reinterview was not possible, by personal visit.

The CAPI and PAPI QC reinterviews involved both original interview cases and original noninterview cases. For original interview cases, the CAPI and PAPI reinterviews attempted to verify that the FR contacted the unit, that the household roster membership was correct, and that the FR asked certain types of questions. The SFR also re-asked the tenure

¹This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress.

questions for subsequent analysis of response differences by Census Bureau Headquarters (HQ) staff. The reinterview was complete if the SFR was able to determine whether or not the FR made contact and properly interviewed the original interview case. For original noninterview cases, the CAPI and PAPI QC reinterviews attempted to verify the unit's noninterview status. The reinterview was complete if the SFR was able to determine whether or not the FR properly classified the original case's noninterview status.

3.2 CEQ CAPI Reinterview Sample

HQ performed the sample selection for the CEQ CAPI reinterview. At the start of the dress rehearsal, it randomly assigned each FR to one of seven groups. Each interview month, it randomly selected reinterview cases for each FR with an original assignment in one of these seven predetermined groups. It selected five cases for a FR with less than 12 months of interviewing experience and eight cases for a FR with 12 or more months of experience. Upon receiving the output files from the completed original cases, HQ performed eligibility checks and eliminated any sample case determined to be ineligible. Ineligible cases included original Type A noninterviews (example, refusals), original cases observed by the SFR, and original cases reassigned to another FR. HQ then transmitted the eligible sample cases to the SFRs' laptops. The result was a total of 727 QC reinterview cases for the CEQ CAPI dress rehearsal.

3.3 CEQ PAPI Reinterview Sample

The Census Bureau's 12 regional offices (ROs) performed the sample selection for the CEQ PAPI reinterview. At the start of the 2002 calendar year, each RO randomly assigned each of its FRs to one of 12 groups. Each interview month, the ROs randomly selected reinterview cases for each FR with an original assignment in two of these twelve predetermined groups. Using the STAR (System to Automate Regions), the ROs selected approximately 1/3 of a FR's cases. Upon receiving the completed original questionnaires, the ROs prepared the paper reinterview questionnaires, excluding any sample case that was an original Type A noninterview, observed by the SFR, or reassigned to another FR. The result was a total of 1400 QC reinterview cases for the CEQ PAPI production from March through September, the time period of the CEQ CAPI dress rehearsal reinterview.

3.4 CEQ CAPI and PAPI SFRs

A total of 83 SFRs performed the CAPI reinterview during the dress rehearsal, with each SFR

having between one to seven assignments. A total of 147 SFRs performed the PAPI reinterview during the March through September production period, with each SFR also having between one to seven PAPI assignments. The number of SFRs who had both CAPI and PAPI assignments was 59. The average CAPI and PAPI assignments contained three to four reinterview cases.

4.0 Results and Discussion

4.1 Reinterview Response Rates

The reinterview response rate (p) represents the number of complete reinterviews (x) divided by the total number of reinterview cases (n). Our analysis showed that the reinterview response rates for the CAPI and PAPI reinterviews were significantly different at the $\alpha = .10$ level. The reinterview response rate from CAPI (80.1%) was less than the reinterview response rate from PAPI (88.5%) for the period from March through September, as shown in Part A of Table 1.

To determine if original outcome affected the difference between the CAPI and PAPI reinterview response rates, we compared these rates separately for original interview cases and for original noninterview cases. Again, our analysis showed significant differences at the $\alpha = .10$ level between the two instrument modes for both original interview cases and original noninterview cases. The reinterview response rates from CAPI (81.0% for original interviews and 75.9% for original noninterviews) were both less than the corresponding reinterview response rates from PAPI (88.3% and 89.4%, respectively), as shown in Parts B and C of Table 1.

Lastly, to determine if SFRs with only one type of assignment, either CAPI or PAPI, affected the difference between the reinterview response rates, we compared these rates for those 59 SFRs who had both CAPI and PAPI assignments. We reached the same conclusion - the reinterview response rates were significantly different at the $\alpha = .10$ level between the two instrument modes. The reinterview response rate from CAPI (79.1%) was less than the reinterview response rate from PAPI (87.6%) for the cases assigned to these 59 SFRs, as shown in Part D of Table 1.

Table 1. Reinterview Response Rates

Part A. All Cases			
	x	n	p
CAPI	582	727	.801
PAPI	1239	1400	.885
z	-5.264		
Part B. Original Interview Cases			
	x	n	p
CAPI	481	594	.810
PAPI	969	1098	.883
z	-4.080		
Part C. Original Noninterview Cases			
	x	n	p
CAPI	101	133	.759
PAPI	270	302	.894
z	-3.652		
Part D. Common CAPI/PAPI SFRs			
	x	n	p
CAPI	451	570	.791
PAPI	587	670	.876
z	-4.034		

We did not expect to find a difference in the reinterview response rates between the CAPI and PAPI reinterviews. However, we propose 1) the greater importance placed on production by the ROs and the field staffs and 2) a learning factor as possible reasons for CAPI's lower reinterview response rates. In terms of greater importance, the ROs monitor production response rates very closely and use them as a measure of FR performance. In terms of learning, the CAPI dress rehearsal was the CEQ Survey's first full-scale test of both its automated original questionnaire and reinterview questionnaire in the field, so some adaptation to the new instrument mode was a normal consequence.

The original survey also had results similar to the reinterview. Original response rates for the time period from March through September 2002 were 78.1 percent from the CAPI dress rehearsal and 79.5 percent from the PAPI production. These rates were likewise significantly different at the $\alpha = .10$ level ($z = -2.49$).

4.2 Lag Times from Original to Reinterview

The lag time from the original interview to the reinterview represents the number of days from when the FR finished an original case to when the

SFR finished the reinterview for that case. Our analysis showed that the average lag times (\bar{x}) from the CAPI and PAPI reinterviews were significantly different at the $\alpha = .10$ level. The average lag time from the original interview to the reinterview for CAPI (23 days) was less than the average lag time from the original interview to the reinterview for PAPI (35 days) for the period from March through September 2002, as shown in Part A of Table 2.

Due to the efficiencies of the automated original and reinterview systems, we expected to find a difference in the lag times between the CAPI and PAPI reinterviews. The PAPI reinterview required the FRs to mail their completed original work to the ROs in weekly transmittals, while the CAPI reinterview allowed the daily transmissions of completed original cases from the FRs' laptops to the ROs. After the ROs received the original PAPI questionnaires, they needed to manually prepare the reinterview questionnaires. Once they prepared an entire reinterview assignment, they mailed it to the SFR. On the other hand, the ROs made daily transmissions of accepted CAPI work to HQ. When HQ received an original case, it extracted the original output, created the reinterview input, and transmitted the reinterview case to the SFR's laptop. SFRs continually received cases in their reinterview assignments throughout the interview month. Generally, a CAPI reinterview case can be on a SFR's laptop two to three days after the FR completes the original.

Even though our analysis showed an improvement in time lag from the original interview to the reinterview for CAPI, we think the SFRs could have performed both the CAPI and PAPI reinterviews in a timelier manner. CAPI procedures called for the SFR to "Conduct QC reinterviews as soon as possible" and stated that "Each QC reinterview case should be completed within two weeks of the original interview." However, Part B of Table 2 shows that the SFRs completed only 20.6 percent of their CAPI reinterviews within the procedural two-week time frame. The same procrastination held true for the PAPI reinterview. PAPI production procedures stated that, "In order to maximize respondent recall, begin reinterview as soon as possible after the original case was completed. Do not conduct reinterview more than four weeks after the original interview." However, the SFRs completed only 27.7 percent of their PAPI reinterviews within the procedural four-week time frame.

Table 2. Lag Time from Original to Reinterview

Part A. Average Lag Times				
	\bar{x}	n	s^2	
CAPI	23	691	95.154	
PAPI	35	1386	145.801	
t	-23.165			
Part B. Frequency Distributions of Lag Times				
Lag Time-Days	CAPI		PAPI	
	Percent	Cum.%	Percent	Cum.%
1-7	4.8	4.8	.9	.9
8-14	15.8	20.6	4.0	4.9
15-21	26.8	47.3	8.6	13.5
22-28	20.3	67.6	14.2	27.7
29-35	21.0	88.6	21.1	48.9
36-42	9.1	97.7	22.7	71.6
43-49	2.3	100.0	15.8	87.4
50-56			9.6	97.0
>56			3.0	100.0

4.3 Suspected Falsification Rates

We define falsification as any **intentional** deviation by the FR from current interviewing procedures to avoid interviewing and/or properly classifying units. The suspected falsification rate (p) represents the number of cases the SFR suspected of falsification (x) divided by the total number of complete reinterviews (n). Our analysis showed that the suspected falsification rates for the CAPI and PAPI reinterviews were not significantly different at the $\alpha = .10$ level (0.52 percent versus 0.48 percent, respectively, as shown in Part A of Table 3). Therefore, the introduction of the CAPI instrument did not hinder the SFR from suspecting falsification.

For both the CAPI and PAPI reinterviews, if the SFR suspected falsification, the case went on to supervisory review in the RO. Here the RO determined whether or not the suspected falsification warranted an investigation of the FR's original assignment. If so, the RO proceeded with the investigation, documenting their findings on the Form 11-163, Field Representative Data Falsification Followup. None of the three suspected CAPI cases led to investigations by the ROs, but four of the six suspected PAPI cases did cause the ROs to investigate

the assignments of the FRs in question. The investigations cleared three of the FRs, but confirmed falsification in the fourth FR's assignment. (Note: There are numerous Census Bureau studies of interviewer falsification based on the data documented on the Forms 11-163. Tupek (2000) is one such study that reported the national rate of confirmed FR falsification at 0.49 percent over all surveys, one-time and on-going, from 1985 to 1999.)

For our analysis, we further examined the three suspected CAPI cases and the six suspected PAPI cases to gain insight into what discrepancies the SFRs detected between the original and reinterview which led them to suspect falsification using the two instrument modes. Part B of Table 3 lists these discrepancies by case. Common discrepancies detected by both the CAPI and PAPI reinterviews are

- original interview cases claimed by the respondents not to have been interviewed, and
- original vacant noninterview cases found by the SFRs to have been occupied at the time of the original interview.

Table 3. Suspected Falsification Cases

Part A. Suspected Falsification Rates			
	x	n	p
CAPI	3	582	.0052
PAPI	6	1239	.0048
z	0.089		
Part B. Discrepancies Detected			
Original	Discrepancy Detected		
<u>CAPI Cases:</u>			
Interview	respondent not interviewed		
Interview	not all questions asked		
Vacant	occupied unit at time of original		
<u>PAPI Cases:</u>			
Interview - 2	respondent not interviewed		
Interview - 2	respondent refused interview		
Vacant	occupied unit at time of original		
Vacant	temporarily absent at time of original		

4.4 Noninterview Misclassification Rates

The noninterview misclassification rate (p) represents the number of cases the SFR determined had an incorrect noninterview classification (x) divided by the total number of complete reinterviews of original noninterview cases (n). Our analysis showed that the noninterview misclassification rates for the CAPI and PAPI reinterviews were not significantly different at the $\alpha = .10$ level (4.0 % versus 5.6 %, respectively, as shown in Part A of Table 4). Therefore, the introduction of the CAPI instrument did not hinder the SFR from determining an original noninterview as misclassified.

Table 4. Noninterview Misclassification Cases

Part A. Noninterview Misclassification Rates			
	x	n	p
CAPI	4	101	.040
PAPI	15	270	.056
z	-0.620		

Part B. Misclassifications Detected	
Original	Reinterview
<u>CAPI Cases:</u>	
Vacant - 3	Occupied
Type B Other	Vacant for rent
<u>PAPI Cases:</u>	
Vacant - 2	Occupied
Vacant - 2	Temporarily absent
Vacant	No one home
Vacant	Type B Other
Vacant	Condemned
Under construction - 2	Vacant
Usual residence elsewhere	Vacant
Type B Other	Unable to verify
Condemned	Vacant
CU moved	Type C Other

Even though there was no evidence of a difference in noninterview misclassification rates between the two instrument modes, we examined the four misclassified CAPI cases and the 15 misclassified PAPI cases. We looked at the FR's noninterview classification from the original and the SFR's classification from the reinterview for each case to determine the types of noninterview misclassification

found by the SFRs using the two instrument modes. Part B of Table 4 lists each misclassified case. The classification of an occupied unit as vacant by the FR is a common misclassification detected by both the CAPI and PAPI reinterviews.

4.5 Household Roster Discrepancy Rates

The household roster discrepancy rate (p) represents the number of cases the SFR verified had one or more household members erroneously included on or excluded from the roster (x) divided by the total number of complete reinterviews of original interview cases (n). Our analysis showed that the household roster discrepancy rates for the CAPI and PAPI reinterviews were significantly different at the $\alpha = .10$ level. The household roster discrepancy rate from CAPI (1.5%) was greater than the household roster discrepancy rate from PAPI (0.5%) for the period from March through September 2002, as shown in Table 5.

Table 5. Household Roster Discrepancy Rates

	x	n	p
CAPI	7	481	.015
PAPI	5	966	.005
z	1.853		

We propose that a possible reason for the difference in household roster discrepancy rates between the two instrument modes was the way in which the instruments handled the verification of the roster. The CAPI instrument used a sequence of four detailed questions, while the paper questionnaire gave the SFR a general instruction. The CAPI screens displaying the four detailed questions were:

- The following question read by the SFR to the respondent.

[Fill: display of household roster]
Our records indicate that ♦ Read above names of household members ♦ were living or staying at [Fill: sample unit address] on [Fill: interview date].
Were these people living or staying at the household?
1. Yes
2. No

- The following instruction for the SFR, if the respondent answered “No” to the above question.

[Fill: display of household roster]

◆ Enter the line number of the listed household member(s) who weren’t living or staying the household.

- The following question read by the SFR to the respondent.

[Fill: display of household roster]

Have I missed anyone who wasn’t away at college or who doesn’t have a usual residence elsewhere?

1. Yes
2. No

- The following instruction for the SFR, if the respondent answered “Yes” to the above question.

[Fill: display of household roster]

◆ Enter the name of the person(s) missing who weren’t away at college or who don’t have a usual residence elsewhere.

On the other hand, in the PAPI Survey, “Household Record” was one of several items on the Form CE-300, CEQ Control Card, completed by the FR during the original interview. The paper reinterview questionnaire included a “Control Card Check” section with the general instruction for the SFR to “Verify the following Control Card items,” of which “Household Record” was one. In that section’s “Household Record” item, the SFR simply marked whether the roster was “Correct” or “Incorrect,” and if incorrect, the “Number of HH members added” and/or the “Number of HH members deleted.”

5.0 Conclusion

Our results revealed that the CAPI instrument provided a more efficient mode for reinterview. Our comparison of the reinterview results from the CEQ CAPI dress rehearsal and the CEQ PAPI production showed that the only negative effect of the CAPI instrument was a lower reinterview response rate, which we attribute to 1) the greater importance the ROs and field staffs place on production and 2) the SFRs’ period of adjustment and learning from a PAPI to a CAPI survey. We expect reinterview response rates to improve with the onset and continuation of CAPI production.

(Note: Recent reinterview results from the first three months of CAPI production, April, May, and June 2003, showed monthly reinterview response rates of

88.1 percent, 87.8 percent, and 90.0 percent, respectively, at the national level.)

In terms of benefits, the CAPI reinterview system automated sampling and centralized it in HQ, thereby eliminating the manual sampling and adjustments by each RO. Daily transmissions of original output files and reinterview input files allowed the SFRs to receive their reinterview cases within a few days from when the FRs completed them, thereby eliminating the timely mail transmittals of materials and the preparation of questionnaires by the ROs.

Lastly, the CAPI reinterview instrument allowed detailed screens and provided an environment for consistency from case to case and from SFR to SFR, since it controlled the pathing and display of the reinterview questions. Such detail and consistency helps provide a thorough and accurate reinterview, as shown in the more effective way the CAPI instrument verified household roster.

6.0 References

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