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Chapter 6: Behavior Change Techniques for Reducing Interviewer Contributions to Total Survey Error Appendix 6

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Chapter 6: Behavior Change Techniques for Reducing Interviewer Contributions
to Total Survey Error

Appendix 6

Brad Edwards, Hanyu Sun, and Ryan Hubbard

Full book reference:

Olson, K., J. D. Smyth, J. Dykema, A. L. Holbrook, F. Kreuter, B. T. West. 2020. *Interviewer Effects from a Total Survey Error Perspective*. Boca Raton: CRC Press.

Appendix 6A Medical Expenditure Panel Survey key statistics for prescribed medicines for those 65 and older in the U.S.

Some key MEPS statistics for prescribed medicine utilization and expenditures are illustrated in the table below. The vast majority (just over 90%) of people aged 65 and above in the U.S. who were not institutionalized obtained prescribed medicines in 2016. Medicines were obtained about 25 times per person on average, and the average total expenditure (including public and private insurance and out-of-pocket payments) for each medicine purchase was \$117. The median annual expenditures per person who had at least one prescribed medicine purchase was \$1,100, but the mean was much higher, \$3,289. Two factors explain this large difference: some people have many prescribed medicine purchases, and some prescribed medicines are extremely expensive – the tails of both distributions are very long. This pattern is typical of most types of medical utilization and expenditures. The key statistics are quite sensitive to data from outliers. This puts a premium on high quality interviewing.

Table A6A.1 Key MEPS statistics, prescribed medicines for the non-institutionalized 65+ population, 2016

Description	Statistic
Population with expense	46,409,000
Proportion of total population with expense	90.2%
Number of prescription events	1,304,000
Mean events per person	25.4
Mean expenditures per event	\$117
Mean expenditures per person with at least one event	\$3,289
Median expenditures per person with at least one event	\$1,100
Total expenditures	\$152,602,000,000

Source: Medical Expenditure Panel Survey, Agency for Healthcare Research and Quality.

<https://meps.ahrq.gov/mepsweb/>.

Appendix 6B CAPI screenshots

Thanks for keeping these records. Let me review the records with you first.
 Please tell me who the record is for, and the type of record you're looking at, such as a calendar, or a provider statement, patient portal information, payment records, prescription records such as medicine bottles, or something else.

Do you have a calendar with health entries?

NAVIGATION: Complete the grid in order of respondent's answers.

- 1. YES, HAS CALENDAR WITH HEALTH CARE ENTRIES FOR LUCY ANN BROWN**
- 2. NO, DOES NOT HAVE CALENDAR WITH HEALTH CARE ENTRIES FOR LUCY ANN BROWN**

Records for RU member	CA30_01 Calendar with health care entries	CA30_02 Provider or Insurance Statements	CA30_03 Patient Portal	CA30_04 Payment Records	CA30_05 Rx Records/ Bottles	CA30_06 PR/MB Follow-Up	CA30_07 Other	CA30_08 Other Specify
LUCY ANN BROWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GEORGE BROWN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SAM BROWN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Medical Expenditure Panel Survey: Calendar series screenshot simulation

 PP-1

The next set of questions help make sure we haven't missed any additional health care for any people living here.

As I ask the questions, please look at the corresponding show cards and think about any additional health care each person received.

Let's start with hospitals. Looking at card PP-1, since August 15, 2018, were you admitted to the hospital for any period of time?

1. Yes

2. No

Lucy Ann Brown

No

**Medical Expenditure Panel Survey: Hospital in-patient provider probe
screenshot simulation**

Appendix 6C Westat's CARI code screenshots

WesCARI Screenshots: Mentor Menu

[| Home](#) | [My Account](#)

Please select a project role:

- Initial Coding
- Second Coding
- Targeted Review
- Field Review
- Mentor Feedback Form
- Interviewer Feedback
- Browse By Coder
- Browse Feedback
- Scheduler
- Browse
- Generate Reports

WesCARI Screenshot: Question Level Coding

Code Audio Recording

General Information

Interviewer ID	1036382	Household ID	11384932803	Region	2
# Completed in Previous 7 Days	10	Language	English	PSU	11821
# Completed in Total	10	Start Date	1/17/2017		
# Refused in Previous 7 Days	0	Start Time	11:01:19M		
# Ever Refused in Total	0	Total Time for Interview Misses	0:0		
		Ever Refused	No		
		Previous Status	EE-Sampled		
		Total # of Contacts	3		

Question name: [MetroConsent_AAs](#)

Cycle: 1 of 1 Audio for Cycle: Cycle 1

Stage of coding: [Field Review](#) Coder ID: [81484468](#)

▶ 0:00 / 0:10 🔊 🔍

Enlarge Screen Shot (click image to enlarge)



Question Response

English Change Language

1. How clearly can you hear the interviewer on this recording? --
2. How clearly can you hear the respondent on this recording? --
3. Is the interviewer asking the questions as if talking with another person?

 Yes No Neither Question not read
4. Can you hear someone responding to the interviewer?

 Yes No Neither
5. Does audio match the interviewer's entry?

Previous recording
Next Recording
Cancel

WesCARI Screenshot: Interviewer Feedback Case Report

Interviewer Feedback Case Report

Interviewer ID: 1036382								
Interviewer Name: Craig Kay	Link to Recording							
Case ID: 10364850084								
Date of Interview: 1/27/2017 10:42:28 AM								

	Question Asked Correctly	Changed Question Wording	Changed Response Category	Changed Introduction	Did Not Read Reference Period	Changed Other Text in the Question	Probing Failure	Leading Probe
IntroConsent.A4a	X							
IntroConsent.A4b	X							
ICM40Consent.ICM40Consent[1].A1IntroC	X				X	X		
ICM40Consent.ICM40Consent[1].A1	X							X
ICM40Consent.ICM40Consent[1].A2	X							
PublicAssistance.0 IntroCAMP	X							
PublicAssistance.05	X							X
PublicAssistance.0 IntroCAMP	X							
PublicAssistance.017					X	X		
PublicAssistance.018	X				X	X		
IRF# Composition, Intro								
IRF# Composition, E1	X							
IRF# Composition, E3	X							
Measure Sources, P7 Intro					X			
Measure Sources, P7a	X							
Measure Characteristics, Intro	X							
Measure Characteristics, E1					X	X		
Measure Characteristics, E2	X							
Measure Characteristics, E3	X							
Measure Characteristics, E4	X							

Comments:

I have read and understood this report.

Mentor provides comments on both good and bad cases

WesCARI Screenshot: Case Level Coding

Code Audio Recording

Interviewer ID	11361332	Household ID	113849334001	Region	2
# Completed in Previous 7 Days	18	Language	English	PSID	11821
# Completed in Total	18	Start Date	3/27/2017		
# Refused in Previous 7 Days	0	Start Time	10:07:04		
# Ever Refused in Total	0	Total Time for Interview Minutes	8:13		
		Ever Refused	No		
		Previous Status	SI - In Progress		
		Total # of Contacts	4		

Perf Value: 0.76 Perf Rating: Fair

Summary Questions

1. Is the start time at a reasonable time of day? Yes No unclear
2. Is the length of the interview within the expected range?
3. Can you hear other people who are not part of the survey interview? Yes No unclear
4. Was this interview conducted in person or by telephone? In Person By Telephone unclear
5. How would you rate the interviewer on this case? Excellent Very good Good Fair Poor
6. Which of the following positive behaviors did the interviewer demonstrate? (check all that apply)
 - Was consistently polite and respectful
 - Spoke at an appropriate pace for respondent
 - Had a consistent or appropriate tone of voice

[Return to Interviewer List](#)

WesCARI Screenshot: Mentor Feedback Form

Feedback Form

Interviewer ID: 1010002 Interviewer Name: Craig Jay
 Case ID: 10001702000_02 Mentor:
 Number of cases coded to date:

1. When did you give the feedback for this case to the interviewer?
 Date: / / Months/Day/Year
 Time: : AM *

2. Did you play any recordings for the interviewer?
 Yes
 No

3. Summarize what you discussed with the interviewer.

4. How did the interviewer react to the feedback?
 Agreed with all feedback
 Mostly agreed with the feedback
 Equally agreed and disagreed with the feedback
 Mostly disagreed with the feedback
 Disagreed with all feedback

5. Did the interviewer ask for clarification about the feedback at any time?
 Yes
 No

WesCARI Screenshot: Scheduler

Week starts:

Please enter all the date & time in Eastern time.

Check the box if you are available for the time slot.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:00 AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8:30 AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> cheng_f	<input type="checkbox"/> cheng_f	<input type="checkbox"/>
9:00 AM	<input checked="" type="checkbox"/> [Search ▼]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9:30 AM	<input type="checkbox"/>	<input checked="" type="checkbox"/> [Search ▼]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> cheng_f	<input type="checkbox"/>
10:00 AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> cheng_f	<input type="checkbox"/>	<input type="checkbox"/>
10:30 AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> cheng_f	<input type="checkbox"/>
11:00 AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> cheng_f	<input type="checkbox"/> cheng_f	<input type="checkbox"/>
11:30 AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12:00 PM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12:30 PM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mentor provides availability for the next week in advance

Appendix 6D Coding scheme

Calendar Series:

1. How well can you hear the interviewer on this recording?
 - 1=Very Clear
 - 2=Somewhat clear
 - 3=Not very clear
 - 4=Cannot hear the interviewer

2. How well can you hear the respondent on this recording?
 - 1=Very Clear
 - 2=Somewhat clear
 - 3=Not very clear
 - 4=Cannot hear the interviewer

3. What can you hear on this recording?
 - 1=Question and Answer
 - 2=Question only
 - 3=Answer only
 - 4=Neither the question nor answer

4. Did the interviewer read the question as it is worded
 - 1=Yes (**End of coding**)
 - 2=No
 - 3=Unclear

5. (**If Q4 =No or Q4=Unclear**) Did the interviewer maintain the question meaning?
 - 1=Yes
 - 2=No
 - 3=Unclear

Provider Probes

1. How well can you hear the interviewer on this recording?
 - 1=Very clear
 - 2=Somewhat clear
 - 3=Not very clear
 - 4=Cannot hear the interviewer

2. How well can you hear the respondent on this recording?
 - 1=Very clear
 - 2=Somewhat clear
 - 3=Not very clear
 - 4=Cannot hear the interviewer

3. What can you hear on this recording?
 - 1=Question and answer
 - 2=Question only
 - 3=Answer only
 - 4=Neither the question nor answer

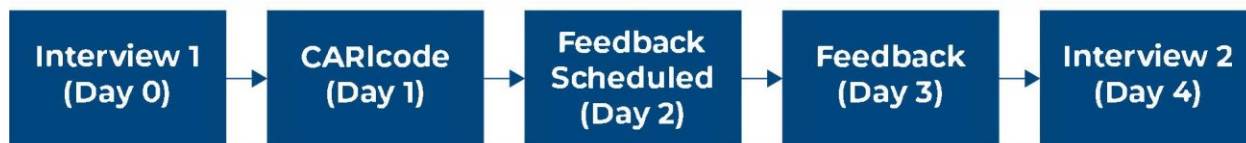
4. Did the interviewer read the question as it is worded?
 - 1=Yes (**Skip to Q7**)
 - 2=No
 - 3=Unclear

5. (**If Q4 =No or Q4 =Unclear**) Did the interviewer read the examples provided for the type of doctors or health care professionals?
 - 1=Yes
 - 2=No
 - 3=Unclear

6. (**If Q4 =No or Q4=Unclear**) Did the interviewer maintain the question meaning?
 - 1=Yes
 - 2=No
 - 3=Unclear

7. Did the interviewer back up to or wait for a more appropriate probe to enter a respondent's answer about health care events?
 - 1=Yes
 - 2=No
 - 3=Unclear
 - 4=NA

Appendix 6E Flowchart of CARI rapid feedback process



CARIcone Rapid Feedback Process

Appendix 6F Multilevel multinomial logistic regression models

Table A6F.1 Parameter estimates in the multilevel multinomial logistic regression models, predicting interviewer behavior (verbatim vs. did maintain the meaning, maintained the meaning vs. did not maintain the)

Parameter	Model 1 (Figure 6.4)		Model 2 (Figure 6.5)	
	Estimate	SE	Estimate	SE
Intercept (1)	4.3***	0.5	3.9***	0.6
Intercept (2)	4.5***	0.4	4.4***	0.5
Before Feedback (vs. After Feedback) (1)	-0.8*	0.4	-0.4	0.5
Before Feedback (vs. After Feedback) (2)	-0.2	0.4	0.2	0.5
Calendar Series (vs. Provider Probes) (1)	-1.9***	0.2	-0.6	0.5
Calendar Series (vs. Provider Probes) (2)	-0.3	0.2	-0.1	0.5
Asked for Clarification (vs. Did Not Ask for Clarification) (1)	-0.9	0.4	0.7	0.6
Asked for Clarification (vs. Did Not Ask for Clarification) (2)	-0.2	0.4	1.0	0.6
Two-way Interaction				
Before Feedback * Calendar Series (1)			-0.8	0.6
Before Feedback * Calendar Series (2)			-0.5	0.6
Before Feedback * Asked for Clarification (1)			-2.1*	0.8
Before Feedback * Asked for Clarification (2)			-3.5***	0.8
Calendar Series * Asked for Clarification (1)	-0.6	0.7	-4.1***	0.7
Calendar Series * Asked for Clarification (2)	-1.6*	0.7	-2.3***	0.7
Three-way Interaction				
Before Feedback * Calendar Series * Asked for Clarification (1)			-14.0	375.6
Before Feedback * Calendar Series * Asked for Clarification (2)			3.4***	0.8
Covariance Parameter				
$\sigma_{int:question}^2$ (1)	14.6	3.2	15.9	3.5
$\sigma_{int:question}^2$ (2)	7.2	1.6	7.7	1.7

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. There were 112 interviewers. The number of questions each interviewer had ranges from 15 to 121 with the mean of 50. The number of observations used is 4626 questions of calendar series and provider probes. The dependent variable is whether the interviewer followed the interviewing protocol including three categories: verbatim, maintained the meaning, and did not maintain the meaning (reference group). The comparison between verbatim vs. did not maintain the meaning is denoted as (1), and the comparison between maintained the meaning vs. did not maintain the

meaning is denoted as (2). The unconditional model with random effects only show that interviewers accounted for 80% of the variance for verbatim vs. did not maintain the meaning and 63% of the variance for maintained the meaning vs. did not maintain the meaning.

Appendix 6G Multilevel multinomial logistic regression models with interviewer experience

Table A6G.1 Parameter estimates in the multilevel multinomial logistic regression model with the interviewer's experience, predicting interviewer behavior (verbatim vs. did maintain the meaning, maintained the meaning vs. did not maintain the meaning)

Parameter	Model 1 (Experience in Years)		Model 2 (Experienced Yes vs. No)	
	Estimate	Standard Error	Estimate	Standard Error
Intercept (1)	4.0***	0.8	4.1***	0.6
Intercept (2)	3.9***	0.6	4.5***	0.5
Before Feedback (vs. After Feedback) (1)	-0.4	0.5	-0.4	0.5
Before Feedback (vs. After Feedback) (2)	0.2	0.5	0.2	0.5
Calendar Series (vs. Provider Probes) (1)	-0.6	0.5	-0.6	0.5
Calendar Series (vs. Provider Probes) (2)	-0.1	0.5	-0.1	0.5
Asked for Clarification (vs. Did Not Ask for Clarification) (1)	0.7	0.6	0.7	0.6
Asked for Clarification (vs. Did Not Ask for Clarification) (2)	1.1	0.6	1.0	0.6
Two-way Interaction				
Before Feedback (1) * Calendar Series (1)	-0.8	0.6	-0.8	0.6
Before Feedback (2) * Calendar Series (2)	-0.5	0.6	-0.5	0.6
Before Feedback (1) * Asked for Clarification (1)	-2.1*	0.8	-2.0*	0.8
Before Feedback (2) * Asked for Clarification (2)	-3.5***	0.8	-3.4***	0.8
Calendar Series (1) * Asked for Clarification (1)	-4.2***	0.7	-4.1***	0.7
Calendar Series (2) * Asked for Clarification (2)	-2.3***	0.7	-2.3***	0.7
Three-way Interaction				
Before Feedback (1) * Calendar Series (1) * Asked for Clarification (1)	-5.2	4.9	-12.7	194.5
Before Feedback (2) * Calendar Series (2) * Asked for Clarification (2)	3.5***	0.8	3.4***	0.8
Experience in Years (1)	0.0	0.1		
Experience in Years (2)	0.1	0.1		
Experienced: Yes (vs. No) (1)			-1.1	1.4
Experienced: Yes (vs. No) (2)			-0.8	1.0
Covariance Parameter				
$\sigma_{int:question}^2$ (1)	16.1	3.6	16.0	3.5
$\sigma_{int:question}^2$ (2)	7.6	1.7	7.8	1.7

Note: * p<0.05, ** p<0.01, *** p<0.001. There were 112 interviewers. The number of questions each interviewer had ranges from 15 to 121 with the mean of 50. The number of observations used is 4626

questions of calendar series and provider probes. The dependent variable is whether the interviewer followed the interviewing protocol including three categories: verbatim, maintained the meaning, and did not maintain the meaning (reference group). The comparison between verbatim vs. did not maintain the meaning is denoted as (1), and the comparison between maintained the meaning vs. did not maintain the meaning is denoted as (2). The interviewer's experience was used as a continuous predictor in Model 1 and a dichotomous predictor in Model 2.

Appendix 6H Alert frequency

Table A6H.1 Data quality alerts, frequency by type

Alert Type	Count	Percent
Record usage (general), all medical events	1,968	84.4%
Record usage prescribed medicines (65+)	243	10.4%
Zero night hospital stays (admission and discharge on same day)	117	5.0%
Respondent under 18	4	0.2%
Total	2,332	100.0%