

CARI: The Places We Can Go...

Addressing Total Survey Error

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CARI and Total Survey Error

- CARI – address different components of total survey error
- CARI an alternative method for informing **error reduction** efforts
 - Interviewer error
 - Measurement error
 - Nonresponse

CARI and Total Survey Error

- CARI approach for **estimating magnitude** of measurement error
 - Probability sampling capability – quantitative method
 - Doesn't require an external benchmark, reinterview
 - Reflects actual survey environment
 - Estimate of error can be used in variety of ways

CARI Functions for Reducing Components of Survey Error

	Interviewer Error	Measurement Error	Nonresponse Error
Interview Validation	X		
Interviewer Performance	X		
Data Capture			
• Open ended items	X	X	
• Data Editing	X	X	
• Informed Consent			X
Question Assessment		X	

Interview Validation – Reducing Interviewer Error

- Traditional approach
 - Reinterview of a sample of cases, usually by phone, limited content
- CARI
 - Configure laptop to record some portion of the interview
 - Transmit recordings along with survey data
 - Code
- Both approaches successfully identify falsifiers – difference in timing/cost



Code Audio Recording

General Information

Interviewer ID	NHAT0002	Case ID	P0000130	Field Region:	1
Count of cases assigned at start of field period	19	Date of interview	08NOV10	Work Area:	998
Refusal Conversion Specialist: Y/N	N	CARICode load date:	12/9/2010 2:46:14 PM		
# completes in previous week	0	Language	English		
# completes in total	8	Respondent TType :(Proxy/Self)	Self		
# ever refuse in previous week	2	Start Time (including AM/PM)	3:33:10 PM		
# ever refuse in total	8	Total time of interview :hh.mm	0:02:07		
		Range for interview time (full sample)	0:00:45 - 0:01:15		
		Ever refused disposition (at any time)	Y		
		Last disposition prior to complete	Appointment Set		
		Total # of contacts	2		

Question name: HT1

Cycle: 1 of 1

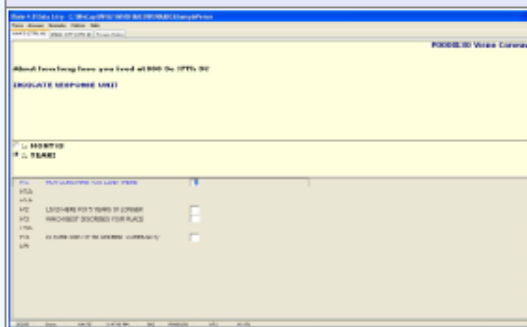
Audio for Cycle: Cycle 1

Stage of coding: Initial Validation Coding

Coder ID: ecls0004



Blaise Screen Shot (click image to enlarge)



- How clearly can you hear the interviewer on this recording?
- How clearly can you hear the respondent on this recording?
- Record the response code that corresponds to the recording. If open-ended, record verbatim response.

- Does audio match the interviewer's entry? Y N Unclear
- Did the interviewer maintain the question meaning? Yes No

6. How did the interviewer change the meaning of the question? (tick all that apply)

Interview Validation: Differences in Effort and Cost

Study	Interview Validation Method	Sample Size for IV	Survey Questions Reviewed	Effort / Duration	Minutes/Item
A	Traditional	7,400	5-7 items	30 min/case	5 min
B	Traditional	1,380	2 items	9 min/case	4.5 min
C	CARI	1,350	6-8 items	7 min/case	1 min

CARI for Interview Validation

- Both traditional and CARI approaches target reduction in **Interviewer Error**
 - identifying/eliminating falsified data
- Some benefits with using CARI
 - Review of audio and other paradata simultaneously
 - Less respondent burden
 - Avoid contact issues, recall issues
 - Reduction in effort and costs
 - More timely identification of problems
 - More scalable, quicker reaction time (hours vs. days)

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Interview Performance – CARI vs. Traditional Approach

- Traditional approach
 - Structured observations
 - Reinterview (field), to lesser extent
- CARI
 - Sample of audio recordings, collected for all interviewers
 - Target particular “interviewer-intensive” questions, as well as less demanding
 - Code skills of interest
- CARI targets more precise level of skills

Assessing Interview Performance: CARI Example

- Grouped interviewers: Targeted or Other
- Coded recordings of at least first interview
 - Ability to correctly answer R question
 - Probe to clarify an ambiguous response
 - When did probe, did so in a neutral manner
- If problem identified, project staff discussed with supervisor and interviewer
 - Interviewer specific feedback
 - Global feedback
- Coded another case (or more) after feedback

Assessing Interviewer Performance: CARI Example

- Measurable improvements in ability to respond to R questions

	First Round of Coding	Second Round of Coding
All interviewers	12%	8%
Other interviewers	11%	9%
Targeted Interviewers	20%	6%

- CARI allowed identification of issue
 - Observation does not give the same broad view
 - Reinterview filtered by respondent's perception

CARI for Interview Performance

- Both traditional and CARI approaches target reduction in **Interviewer Error**
 - identifying interviewer skill deficits (and strengths)
 - CARI provides finer-grain of skills assessment
- Some benefits with using CARI
 - Provides a larger “sample” upon which to assess skills
 - Less obtrusive – removes effect of observer on performance
 - Reduction in costs relative to observation, reinterview

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Data Capture: Open Ended Items & Editing Input

- Use CARI to directly capture responses
- Use CARI to clean data (entered by interviewer) that failed an edit check
- Objective of these functions is to provide improvements in data quality

CARI for Data Capture

- Memory assessment task:
“I want you to tell me all the animals you can think of in one minute. Ready? Go!”
- Data collector records names on paper; enters names after interview
- CARI coder listens independently and enters names
 - Double coded and adjudicated to establish “truth”

Data Capture: Comparing Data Collector and CARI Coder Entry

	Counts	%
Total cases reviewed	73	
Full agreement	27	37%
Data collector entry in error:	46	63%
• Missed animals <u>or</u> added animals	22	48%
• Cases with both errors	24	52%

Data Capture: CARI for Editing

- Editing is standard part of data processing
- Run logic, range checks - flag cases that fail
- Traditionally - corrections based on exploration of data, and set decision rules
- CARI provides additional information for edit decision
 - Unambiguous
 - Direct and less effort/time needed

CARI for Editing – Household Roster

- Editing household roster
 - Relationship to child – e.g., 2 biological mothers
 - Out of range age – e.g., 12 year old mother
- On average, about 2% or fewer cases fail edits
- Roster is input to next interview, so info carried forward
 - Of 175 cases for which audio available, audio ALWAYS resulted in correction to roster in time for next fielding
 - First stop and done

Data Capture: Recording Informed Consent

- National longitudinal survey, school sample, students within schools
- Require parental consent to conduct child/student assessments
- Difference school districts, different procedures for obtaining consent
- CARI as a back-up procedure to paper consent form:
 - Ask for consent in a parent (phone) interview, and record
 - Have staff review recording and generate a form that “certifies” consent given

Data Capture: Recording Informed Consent

82% overall parental consent

- 50% of consents were “authenticated” CARI (no paper)
 - 95% Schools accepted “authenticated consents”, and allowed assessment
- Implication – about 40 percentage point gain in consent rate with acceptance of “authenticated” CARI consent

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Question Assessment: Reducing Measurement Error

- During production
- As part of question development

Question Assessment: Identify Difficult Questions in Production

Question	Respondent needed clarification	Initial answer did not match resp. categ.	R could not provide a valid answer	Read w/ Major change
About how many of this agency's current hospice patients were admitted under Open Access? (n=44)	49%	36%	11%	--
What are {AGENCY}'s patient referral sources for (home health/home/hospice) care? (n=118)	19%	30%	--	--
Is the Medicare fee for service (traditional Medicare), managed care, or some other type of Medicare? (n=75)	27%	29%	--	18%

- No other systematic way to identify these issues
- Provides opportunity to correct

Question Assessment: for Question Development

- National Health and Aging Trends Survey (NHATS)
- Two stages of field testing prior to production
 - Validation study (n=300)
 - Pretest (n=125)
- Recorded and coded 300 questions in VS
- In pretest, coded subset of items:
 - Changed from VS
 - New since VS

CARI and Coding for Question Development

	Question Wording (PA24)	Invalid Response
VS	In the last month, how often did you provide care to another person? This includes looking after or providing hands-on care to a child or adult who cannot care for themselves. [Would you say every day, most days, some days, rarely, or never?]	16%
Pre	In the last month, how often did you provide care or look after another adult or child? This includes looking after or providing hands-on care to a child or adult who cannot care for themselves. [Would you say every day, most days, some days, rarely, or never?]	9%

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What else can CARI do?

Estimating the Magnitude of Error

- Using CARI for estimating magnitude of measurement error
 - Known probability for each coded case
 - SRS of recordings
 - SRS of coding instances
 - Quantitative method for collecting ‘qualitative’ data
 - Project to the entire population (survey respondents)
 - Estimate the standard error, for each “problem” identified

Example: Estimating Magnitude of Error

“What was the main reason someone else did your laundry for you? Was that because of your health or functioning or some other reason?”

- Afraid of falling
- Age
- Memory / poor focus
- Poor balance
- Vision difficulty
- Health condition
- Health
- Functioning
- Other health or functioning reason
- Convenience / Pay someone else
- Do not like to do / Do not prefer it
- Someone else has always done it
- Have never done it
- Someone else offered to
- Can't get there
- Too tired
- Other reason

Example: Estimating Magnitude of Error

- Respondent answer:

“My arthritis is really bad these days. It’s hard for me to get up and down the stairs, especially carrying all that laundry.... And besides she said she doesn’t mind doing it. I really don’t like doing the laundry.”

- Interviewer entry:

“Do not like to do it”

Estimating Magnitude of Error

- Statistic of interest: % of interviewers' entry \neq audio
- Assume: Code cases sampled throughout field period
- Calculate proportion of sample in which interviewer selected incorrect reason
- Known probability of coded instances of that question
- Weight the estimate - Apply selection probability
- Estimate of the proportion of total survey responses reflecting an error

What are Your Options?

- Use magnitude estimate to:
 - Produce a data quality stat for use by analysts
 - To determine whether need to edit the data, or drop the variable
- Can use as an adjustment factor
- Can estimate interviewer error/bias
- In 2-phase responsive design approach, can repeat after making question/training adjustments to assess effectiveness

CARI – Another Tool for Addressing Total Survey Error

- Can use to **reduce** different types of error
 - Nonresponse,
 - Interviewer,
 - Measurement error – as part of development or production
- Also, can use to estimate the magnitude of error in your survey responses (*many birds, one stone...*)
 - Data quality indicator
 - Inform edit activities, and data file content decisions
 - Interviewer error/bias indicator
 - Include as part of 2-phase responsive design approach

CARI – Another Tool for Addressing Total Survey Error

Comments or Questions?

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