Survey Practice This Month

Tuesday, March 24, 2009, 3:20:47 PM | Editor

This month, Survey Practice introduces a new feature - a list of books recently published in public opinion and survey methods. Mario Callegaro has agreed to create an updated list about twice each year. If you have any books that you would like included, send them to the Survey Practice email address.

The articles this month include a method for estimating questionnaire length by Sandra Berry; the results from an experiment conducted by Daniel Merkle and Murray Edelman to increase response rates that also increased bias; and a short article on measuring hang-ups during introductions to telephone surveys (HUDIs) by Barbara O'Hare and Diane Buck.

Please consider submitting an article for the special issue on the uses of non-probability sampling.

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Posted in Monthly Summary Comments: 0

Comments

How To Estimate Questionnaire Administration Time Before Pretesting: An Interactive Spreadsheet Approach

Tuesday, March 24, 2009, 3:17:39 PM | Editor

Sandra H. Berry
RAND Corporation

Survey researchers are often faced with the problem of managing an instrument design process within the framework of a budgeted time constraint for administering the final instrument. While survey managers worry about costs and respondent burden, researchers want to make sure that every relevant construct and potentially important covariate is included, preferably with multi-item measures. The problem is: How can you estimate how long a draft questionnaire will take to administer without actually pretesting it? Or, if some pretesting has occurred, how can you predict the effect of additions or deletions on administration time without more pretesting? Faced with this problem for several large studies, I developed an approach to address the problems of managing the length of an instrument using a simple spreadsheet. Here's how it works.

Getting started

You can begin with an outline and/or a list of specific candidate measures or items or an actual draft instrument. If the instrument is long, it's useful to divide the draft instrument into modules and sections within modules. Modules define basic subject areas, for example, demographics, economic variables, or health related quality of life. Sections within modules define distinct subsections, for example, current sources of income within an economics module.

Once your instrument is broken down into modules and possibly sections, you will want to count how many questions are

within a module or section. Do this by giving each question a raw item value. The rule we use is to count anything that could be asked of respondents as an item and to count each potential data field as a single item. Of course, this does not include checkpoints where the interviewer or computer refers to previously asked question. Using this system, the raw item count for a "circle one" question would be one (see Fig. 1, questions 1 and 3), while a "circle all that apply" would have a raw item count for as many items as there are possible response categories (see Fig. 1, question 2). If the question asks for an amount of time and then a unit (weeks, months, years, etc.), the raw item count is two (see Fig. 1 question 4). If the measures are well established, the item count is usually documented, for example, the health related quality of life measure called the SF-36 has an item count of 36.

Figure 1 - HOW TO COUNT ITEMS

What was your total income in the past year? (Income can come from salaries, wages, social security, welfare, dividends, interest, and any other income.)

TOTAL INCOME IN PAST YEAR:$

RAW ITEMS = 1

2. What were the sources of your income in the past year?

CIRCLE ALL THAT APPLY

Salary or wages 1

Loan(s).....2

Investment dividends.....3

Welfare 4

RAW ITEMS = 4

3. At this time, are you:

CIRCLE ONE

Working full time.....1

Working part-time.....2

On sick leave 3

Not working.....4

RAW ITEMS = 1

4. ASK IF CURRENTLY WORKING: How long have you worked at your current job?

_____

UNIT: WEEKS

MONTHS

YEARS

RAW ITEMS = 2

To start your spreadsheet, list the module numbers in column A and a short title for each module in column B., as shown in Figure 2. Then, total the raw item values in each section or module and put the counts in column C. This is usually quite close to the maximum number of items that could be asked of any (very unlucky) respondent although you may need to refine it as described below, depending on the structure of your instrument.

Next, go through each module, paying attention to skip patterns, and take the shortest possible path through the items -

the path a respondent would take who skipped as many items as possible. Enter the raw item totals for each module in column D. Individually total columns 3 and 4. You have now established the maximum (column C) and minimum (column D) number of items that could be answered.

Figure 2

A	B	C	D
	Module Name	**Raw Item Count**	**Shortest Path**
1	Work status measures	10	1
2	Insurance plan description	4	1
3	Satisfaction with hospital stay	6	1
	TOTAL ITEMS	20	3
	EST ITEMS PER MINUTE	4	
	ESTIMATED ADMIN TIME IN MINUTES	5	.75

Now that you have an idea of the number of items in the modules, you are ready to obtain a preliminary time estimate. For a CAPI survey I recommend using a rule of thumb of about 4 items asked per minute. If you divide the individual column C and D raw item totals by 4, you will have theoretical maximum and minimum times for the draft instrument. This rate works well for an interview that includes short scales with a common set of response categories as well as wordier factual recall or opinion items. If most of your items are of one kind or another, you might adjust the rate up or down, from 3 to 6 items per minute. To consider refinements to the standard items per minute rate, it is helpful to put the rate into a reference cell and use it as a "constant" in formulas. This allows you to quickly see the impact of different assumptions about the rate. A simple spreadsheet like this one is very useful for developing a ballpark estimate of administration time at an early stage. It can be computed for a partial instrument and additional modules can be added later. It can also be used to plan an instrument and allocate approximate numbers of items to each section of the instrument, though these typically need to be adjusted later.

Refining the estimate - "expected" number of items

The preliminary estimate of the number of items can be refined prior to pretesting by calculating the "expected" number of items. This is the number of items that will likely be asked, taking into account the number of respondents to whom each item will actually be administered (skip patterns) and assigning weights. This sounds difficult to do, but it can often be done with considerable accuracy. If a question is going to be asked of everyone, its weight is 1. However, many questions are only asked of a sub-group of the sample. For example, if 50% of the sample is female a series of items asked of "women only" would have a weight of .5 (Column E of the example below). The task is to look at each item or measure and give it a "weight" based on the proportion of respondents to whom it will be administered. You will multiply the number of items in each section by its weight (Column C * Column E below). It's often possible to predict the probability of responding based on expectations about the sample characteristics or by making assumptions about rates for a few key parameters that can be checked from other data sources, for example, by obtaining an estimate of what fraction of the adult population in hospitalized in a year and using that as a weight for a section on satisfaction with hospital stay. It's useful to document how you developed the weights that led to an expected number of items, since this is likely to be a key factor in explaining your estimate.

Now we can expand on our earlier example of a timing table in Figure 2. By adding up the weighted values for each item in the module, we determine the "expected" number of items in column F. Note that the expected total can be significantly lower than the raw item total. At the bottom of column F we divided the expected number of items by a rate of 4 items per minute to obtain an "expected" mean time for administration of the interview. The expected time should fall somewhere

between the maximum and minimum time estimates. It's useful to consider the maximum time as well as the expected time in thinking about acceptable respondent burden, though the expected time is most useful in relation to the budgeted administration time.

Figure 3

A	B	C	D	E	F	G
	Module Name	**Raw Item Count**	**Shortest Path**	**Weight**	**Expected Item Count (C*E)**	**NOTES:** *note assumptions here that led you to your expected item count*
1	Work status measures	10	1	.4	4	40% of sample will be working
2	Insurance plan description	4	1	.3	1.2	30% of sample has insurance
3	Satisfaction with hospital stay	6	1	.2	1.2	20% of sample will have had a hospital
	TOTAL ITEMS	20	3		6.4	
	EST. ITEMS/MINUTE	4.00				
	EXPECTED ADMINSTRATION TIME IN MINUTES	5	.75		1.6	

Using pretest information to further refine the estimation

Pretest data can be used to refine the estimate, especially if the pretest sample is reasonably large and generally representative of the actual sample. Using the pretest frequencies and module-by-module time stamp data, you can obtain a count of the actual number of items asked in each module, refining the "weight" of each item to update the "expected" number of items, and the a rate of items asked per minute.

Predicting the effects of additions and deletions

One of the most helpful uses of the spreadsheet is to model the effects of cuts or additions on the total administration time reflecting changes in the numbers of items to be asked, changes in skip patterns that affect the item weights, or the addition or removal of entire sections of a questionnaire. If you have set up your spreadsheet correctly, it will show an automatic re-calculation of the estimated administration time when you make changes. We display the spreadsheet on an overhead screen to use in meetings where changes are being discussed. It's surprising to most people how many items must be deleted to make a meaningful change in the administration time. If the instrument administration rate is 4 items a minute, cutting 10 minutes requires eliminating 40 items that are asked of everyone, or 80 items, each of which is asked of 50 percent of the respondents. Making that point clearly, in real time, tends to focus efforts to reduce respondent burden and control costs.

How accurate is this prediction?

We've been using this approach for about 10 years. It's very helpful in the planning stages to give instrument designers a sense of how many questions they can afford to ask or to estimate how long it will take to administer the instrument they have planned. The approach was originally developed for CAPI surveys and the rate of about 4 items a minute worked well for that mode. We use a range of 4-6 items per minute for CATI surveys where 4 items a minute seems to work well for lower literacy or elderly populations, 5 is about right for a "general" population, and 6 is used for sections or modules that have a common stem, brief items, and a common response scale. (If the modules have very different kinds of items, it's easy

to use module specific items per minute rates by creating several reference cells and using them to make a time estimate for each module that you can sum for a total estimated administration time.) However, this is not a perfect predictor, so at the initial stages we design an instrument that's 5-10 minutes longer than desired so we can pretest all the candidate items and then prune as needed. We are still experimenting with rates in other modes, although we expect them to be in a similar range.

Conclusions

Controlling the administration time of an instrument is the first step to a successful field effort. Using a basic spreadsheet approach, it's possible to develop a simple interactive model to predict the expected administration time for a draft questionnaire. Doing this at an early stage helps to guide the initial design process and sets the stage for predicting the effects of cuts or additions.

Note: I am very grateful to Shirley Nederend, Julie Brown, and other RAND SRG staff members who helped to refine this method and who provided timing information from their surveys.

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Comments

An Experiment on Improving Response Rates and Its Unintended Impact on Survey Error

Tuesday, March 24, 2009, 3:16:57 PM | Editor

Daniel M. Merkle, ABC News
Murray Edelman, Edelman Consulting

Groves (2007) warns that the "[b]lind pursuit of high response rates in probability samples is unwise" (p. 668) because it may have the unintended consequence of actually increasing survey error. This will happen when efforts to improve the response rate increase the correlation between the propensity to respond and the survey variable being measured. The findings of a study we conducted a while back, in 1997, provide a good illustration of Groves' point. This experiment was designed to test the impact of factors hypothesized to increase the response rate but had the unanticipated effect of increasing survey error.

Many of the studies that explore ways to increase response rates ignore the bigger issue of how methodological changes will impact survey error (see Groves, 2007 for a review). Often it's not possible to compute a measure of error because the population parameters are not known. This experiment was conducted as part of an Election Day exit poll, making it possible to compute a measure of survey error in addition to the response rate.

The key moment in an exit poll occurs when the interviewer approaches the voter. In a matter of just seconds, the request for participation is made and the voter decides whether or not to respond based on the information given. This study tested two factors that were hypothesized to increase response rates and thus decrease survey error. The first was an incentive — a pen which included the logos of the six Voter News Service (VNS) member organizations (ABC, the Associated Press, CBS, CNN, FOX, and NBC).

The second factor tested in this study was the incorporation of a colorful folder over the questionnaire pad to better standardize the interviewer's approach to the voter and to help the interviewer stress key pieces of information that we hypothesized would lead to better compliance. A folder was designed that fit over the right half of the questionnaire pads. On the top of the folder were the color logos of the six media organizations. Below that were the words "Survey of Voters," "Short" and "Confidential." The folder approach was expected to increase response rates for a few reasons:

First, it was expected that stressing key information, that the survey was short and confidential, would make voters more likely to fill it out. As part of a previous evaluation we interviewed voters who refused to fill out the exit poll questionnaire and found that lack of time was the primary reason for refusing, followed by concerns about confidentiality and privacy.

Second, we tried to grab the attention of sampled voters leaving the polling place by making the color folder more eye-catching than the black and white questionnaire that is normally used.

Finally, on the back of the folder we included some directions and helpful hints for the interviewer about how to get voters to fill out the survey, including special instructions detailing how to deal with people who hesitated or refused.

Method

An experiment was conducted as part of the New Jersey and New York City general election exit polls conducted by VNS in November 1997. A total of 80 precincts were randomly selected from all precincts in each state, 44 in New Jersey and 36 in New York City. These precincts were then randomly assigned to one of three conditions:

1.) ***Folder Condition*** — The interviewers in these precincts were given questionnaire pads with the folders described above. In the folder were the standard VNS questionnaires, which were printed in black-and-white and included the logos of the sponsoring media organizations in the upper left-hand corner. All three conditions used the same questionnaire.

2.) ***Folder and Pen Condition*** — The interviewers in these precincts used the folders just described and also offered VNS pens to voters as an incentive for filling out the questionnaire.

3.) ***Traditional Condition*** — The interviewers followed the standard VNS interviewing procedures, approaching voters without the folder and without the pen.

Interviewers randomly selected voters leaving the polling place to fill out the exit poll. (1) They also kept track of each sampled voter who refused to fill out the questionnaire or who they missed. This information was used to compute precinct-level response rates, refusal rates and miss rates.

Two measures of survey error were also computed at the precinct level, using the vote question from the exit poll as the survey estimate and the official precinct votes as the population values. First, the signed error was computed by taking the Democratic percentage minus the Republican percentage from the exit poll and subtracting from it the Democratic percentage minus the Republican percentage from the official vote. (2) Second, a measure of the absolute error was computed by taking the absolute value of the signed error.

Results

a. Pens

Contrary to our expectations, the hypothesis that the pen would increase the response rate was not supported. The average response rate was similar in both the Folder/Pen Condition (55.4 percent) and the Folder Condition (54.2 percent) (see Table One). The same is true of refusal rates: 34.7 percent in the Folder/Pen Condition and 34.3 in the Folder Condition.

Table One
Comparison of Means
--Folder/Pen Vs. Folder Only--

	Folder/Pen (n=27)	Folder (n=26)	SE Diff	t-value
Response rate	55.4	54.2	4.8	.24
Refusal rate	34.7	34.3	3.6	.11
Miss rate	9.9	11.5	2.2	.71
Signed error	7.0	8.3	3.8	.36
Absolute error	11.0	12.6	2.2	.74

*p<.05

The hypothesis that the pen would decrease survey error was also not supported. The Folder/Pen Condition and the Folder Condition did not differ significantly in terms of the signed error or the absolute error (see Table One).

b. Folders

Because the two Folder Conditions were not significantly different from each other, we combined them to test the impact of the Folder by comparing it to the Traditional method. The data suggest that the Folder Condition had a small, although not quite statistically significant, impact on response rates in the hypothesized direction. The response rate was about five percentage points higher using the Folder compared with the Traditional method (t = 1.22, p = .11, one-tailed test) and the refusal rate was 4 percentage points lower in the Folder Condition (t = 1.25, p = .11, one-tailed test) (3) (see Table Two).

Table Two
Comparison of Means
--Folder Vs. Traditional Method--

	Folder (n=53)	Traditional (n=27)	SE Diff	t-value
Response rate	54.8	49.9	4.0	1.22
Refusal rate	34.5	38.4	3.1	1.25
Miss rate	10.7	11.6	2.0	.48
Signed error	7.6	-2.0	4.1	2.33*
Absolute error	12.5	15.5	3.0	1.00

*p<.05

Although these differences do not quite reach the traditional level of statistical significance, an argument could have been made to implement the Folder based on this finding. The cost of implementing the Folder was relatively small compared with the cost of other procedures that might be used to increase response rates, such as incentives or hiring multiple interviewers per precinct.

Based on the response rate results, conventional wisdom might have suggested that survey error would be lower in the Folder Condition than in the Traditional Condition, if only slightly. In fact, the opposite was the case. Contrary to what was hypothesized, the signed error was actually larger in the Folder Condition. The Folder Condition had a fairly large, statistically significant overstatement of the Democratic candidate (7.6 percentage points), whereas the Traditional Condition had a small, nonsignificant Republican overstatement (2.0 percentage points).

Conclusion

Studies that explore ways to increase response rates often ignore the more important issue of how methodological changes will impact survey error. This study is unique because it investigated how a pen incentive and a change in the interviewer's approach in the Folder Condition affected not only response rates but the more critical measure of survey error.

The pen incentive did not have an impact on response rates or survey error. In the Folder Condition there was a slight, although not quite statistically significant, five-point increase in response rates. Had this study focused on response rates as the only measure of survey data quality, this may have seemed like a good enough justification for the implementation of this low-cost procedure in future exit polls. However, that would have been a mistake because the experiment also found that the Folder Condition significantly increased the bias in the vote estimates.

The procedures used in the Folder Condition were more appealing to Democrats than to Republicans. The data do not allow us to determine what specific aspect of the Folder Condition is responsible for this. After conducting this study we initially hypothesized that the color logos of the national news organizations on the folder may have been perceived more positively by Democrats, leading to a greater propensity to respond among these voters. However, an experiment to test the effect of the logos by the second author using the 2000 exit polls did not find an impact of the logos on response rates or error.

While this doesn't rule out the logos as having an effect in this study, there are other possible explanations for the Democratic overstatement. The Folder Condition emphasized that the survey was short and confidential and also included more interviewer training on refusal conversion. These are standard methods for improving response rates but perhaps the message of "short and confidential" appealed more to Democrats than Republicans, and it may have been the case that Democratic refusals were more easily converted than Republican refusals.

But whatever the reason for the effect, the lesson for survey researchers is clear. When studying ways to improve survey data quality it's important to look beyond the impact on response rates and also consider the impact on survey error. As Groves (2007) states, "nonresponse bias is a phenomenon much more complex than mere nonresponse rates." The quest for higher response rates for the sake of higher response rates is misplaced. Surveys with higher response rates are not necessarily more accurate (e.g., Merkle and Edelman, 2002), and manipulations designed to increase response rates can increase survey error if they are differentially attractive to subgroups of the population.

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An earlier version of this paper was presented at the annual conference of the American Association for Public Opinion Research, St. Louis, MO, May 14-17, 1998. The authors would like to thank Kathy Dykeman and Chris Brogan for their help fielding this study.

(1) See Merkle and Edelman (2000; 2002) for details on the VNS exit poll methodology.

(2) Other operationalizations of exit poll error (e.g., Lindeman, Liddle and Brady, 2005) produced results similar to those reported below.

(3) There was an extreme outlier in this analysis, a precinct with a very low response rate of six percent. The reason for this outlier was that the interviewer experienced significant legal problems at the precinct and had to stand over 100 feet away. Dropping this precinct from the analysis strengthens the observed effect on response rate ($t=1.53$, $p = .07$, one-tailed test) and refusal rate ($t=1.39$, $p = .08$, one-tailed test).

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Posted in Methods Comments: 0

Comments

Phone Interview Hang Ups During Introduction: A Growing Challenge

Tuesday, March 24, 2009, 3:15:56 PM | Editor

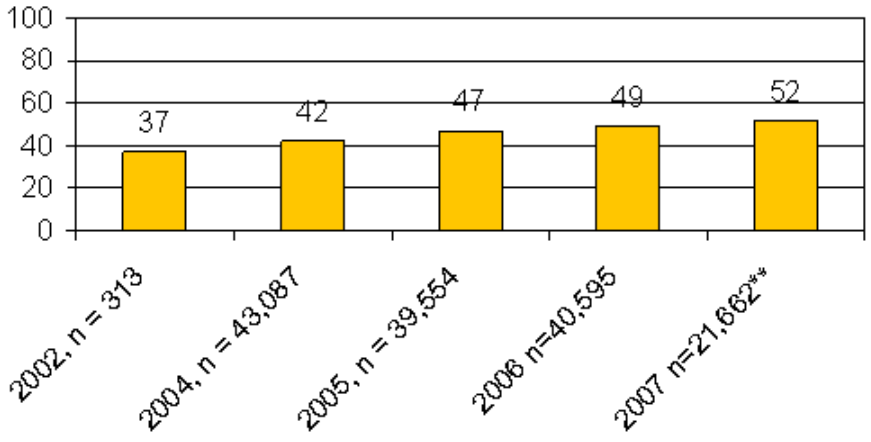
Barbara C. O'Hare, Arbitron Inc.
Diana Buck, Arbitron Inc.

For anyone running a call center or overseeing phone surveys, respondent terminations by hanging up on the interviewer in the first few seconds of the interview are a serious concern. This affects survey completion rates, call throughput rates, and measurement reliability. There is little, if any, time to overcome objections or to assess anything about who has been contacted. Since the early work of Oksenberg and Cannell (1986; 1988), there have been relatively few published studies on what seems to be, among conversations with practitioners, a common problem.

The data presented here describes the incidence and characteristics of hang-ups-during-introduction (sometimes called HUDIs), as experienced by Arbitron Inc. The data are based on the results of standard interviewer monitoring of 5% of all calls and reflect hang-up rates during the first five sentences of the survey, before the first data collection question, whether the respondent has said anything at all or not.

As seen in Figure 1, the incidence of initial hang-ups has been growing steadily over the past five years.

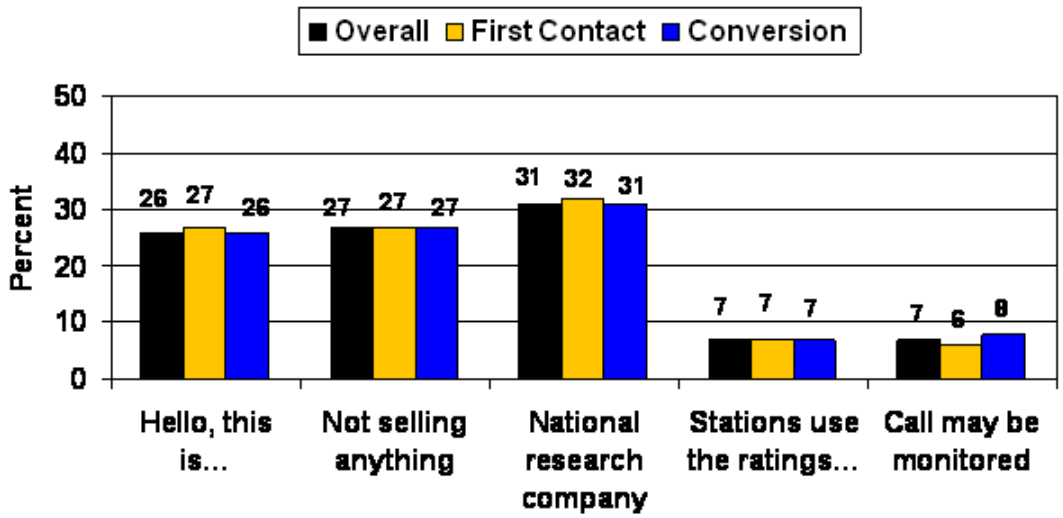
Figure 1. Incidence of Hang-Ups During Introduction as Percent of Contacts



*2002 pilot study
** 2007 partial year

Further, 84% of the hang-ups occur during the first three sentences of the introduction. (Figure 2)

Figure 2. Percent of Hang-Ups by Sentence of Hang-Up



Examination of known characteristics of the phone number found that the small town Midwest stereotype holds. The incidence of HUDIs was significantly lower in the Midwest (46%, $p < .01$) than in the South (49%), Northeast (52%) and West (53%). In the smallest towns of less than 50,000 population, the hang-up rate (47%) was significantly lower than all other larger metropolitan areas. Phone numbers with addresses, which were sent pre-alert mailings before the first call, show a lower incidence of hang-ups (48% vs. 52%, $p<.01$). This is likely the result of both the mailing and other characteristics of the household that differ by address availability.

In an attempt to determine if there were characteristics of smaller units of geography that were predictors of hang-up rates, a logistic model was fit that included 2000 census block group data for all phone numbers for which we had addresses. None of the small area geography indicators, which included home value, income and race added to the significant predictors of time of day of the call, whether the call was a first contact or conversion call, census region and metro rank.

Last, looking at the final outcome of the HUDI cases, we found that 90% of the hang-ups resulted in a final disposition as a refusal.

Conclusions

Although we don't know much about the household when they hang up on us, we know that this group of respondents is particularly challenging and may warrant special procedures to overcome their reluctance to participate. While considerable literature exists experimenting with introductions, including what to say, whether they should be standardized, the value of caller ID and the effects of interviewer characteristics, there is still much to be learned. From the survey researcher and the practitioner perspectives, there are real costs in hang-ups during introductions.

The authors would welcome comments on the experience of other survey organizations in the incidence of HUDIs and what they have tried to attack this particular challenge.

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Recent Books in Public Opinion and Survey Methods

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Mario Callegaro
Knowledge Networks

Bell, R. M., & Cohen, M. L. (Eds.) (2008). *Coverage measurement in the 2010 Census*. Washington D.C.: National Academies Press.

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