Designing a survey: we will cover
   a. The preparation phase
   b. Design and conceptualization phase
   c. Sampling
   d. Writing questions
   e. Constructing response scales
   f. Formatting
   g. Piloting phase
   h. Tips on managing data collection

At the end of this handout are a number of references for you to follow up with specific issues within this enormous subject area.

Please ask questions along the way!

Betsy used Fowler, *Improving Survey Questions*, 1995, when putting together the worksheet—this is a great resource among those listed at the end of this handout.


**Preparation phase: Pre-design considerations**

**Check for existing surveys and survey items**
   o Validity and reliability of the existing surveys strengthens your own data collection
   o What are other people in your small area of research finding? Check for what to expect in terms of response rates, correlation sizes, sample sizes.

**Sampling**: probability and nonprobability, convenience sampling.

**Think about what types of survey**: cross sectional, longitudinal, experimental—your research question will differ

**Think about participant burden**: how long can you make the questionnaire and reasonably expect them to fill it out?
**Design phase: conceptualization**

![Flowchart showing the process of survey design](image)

(Wolnock, 2004)

**Recommendation: Outline your survey content and question objectives**

*E.g.*:

*Purpose of survey:* Survey investigates positive community relations. We think positive community relations are likely to be a function of the following:

- Cooperation
- Open communication
- Trust

*Within these categories, measurement objectives include:*

- **Cooperation**
  - Assistance with taking care of children in village
  - Helping out with fieldwork when there is a need
  - Contributing to public goods like schools and roads
  - Protecting community goods like wells

- **Open communication**
  - Frequency of community meetings
  - Attendance at community meetings
  - Discussions in public areas
  - Visitations to neighbor houses (social network)

*(etc)*

**Envision your eventual database:** this will help you to define and clarify variables and to figure out what kinds of measurement tools (response scales, categorical answers, etc) you want.
Identify method of data collection: Specify mail vs. person vs. phone vs. internet
Examples: skip patterns, agreement forms

Sampling

Choosing a sample design
• Need to take into account with whom, where, and when the survey will be done
  o Need to determine your target population
    ▪ Can you identify your sampling frame?
      ▪ Sampling frame is the list of the target population from which the sample will be drawn. (E.g. a list of seniors enrolled in city high schools at the end of the school year)
      ▪ Inclusion/Exclusion criteria based on who you are hoping to sample. (E.g. not interested in adults, may require respondents be seniors at the city high schools and have transcript data available and be enrolled in a certain number of classes)
  o Probability and Non-probability
    ▪ Probability designs rely on the laws of chance for selecting the sampling elements.
    ▪ Nonprobability designs rely on human judgement.
  • Probability and Non-probability
    o Probability designs rely on the laws of chance for selecting the sampling elements.
    o Nonprobability designs rely on human judgement.
  • 4 basis types of probability sample designs:
    1) Simple random sample (SRS): selected by a procedure that gives every element in the population an equal chance of being included in the sample.
      • May not be very efficient or capture certain groups of interest.
    2) Systematic random sample: researcher picks a random starting point and systematically selects cases from the sampling frame at a specified interval (E.g. list of households, start with the 3rd household on the list and sample every 5th household).
      • Can be biased if there is a pattern in the ordering of the sampling elements, same problems as SRS.
    3) Stratified sample: Entire sampling frame is divided into groups of interest (e.g. racial/ethnic groups) and then use SRS or systematic random sampling within each strata.
      • Requires knowledge of population in advance and may introduce more complexity in data analysis.
    4) Cluster sample: Divide sample into clusters (e.g. schools) and randomly sample the clusters. Then can use SRS, systematic, or stratified sampling within the sampled clusters. Often used in large-scale surveys.
      • Complex data analysis.

Sample Size Estimation
• Need to make sure you have enough people to detect a significant difference between your groups of interest, if a difference really exists. This is known as statistical power.
• Calculators available online that take into account your study design and analyses.
  http://calculators.stat.ucla.edu/
Writing the survey

Things to Consider:

- What kind of information are you going to want available for analysis?
- What kind of analyses will you want to do?
- Remember to get information not just on variables you’re interested, but also on confounders, variables that are known to be associated with your independent and dependent variables.
  - Look to the literature to find out what other people control or adjust for and operationalize those variables in your survey.

- Several types of variables:
  - Continuous
    - E.g. what is your age? Respondent enters number.
  - Categorical: discrete groups.
    - E.g. what is your age? Respondent chooses category 18-24, 25-34, 35-44,
    - Dichotomous: yes/no or presence/absence
      - E.g. do you own a pet?
    - Ordinal: Type of categorical variable where there is a natural ordering to the response categories.
    - Nominal: No natural ordering to categories. E.g., race/ethnicity.
  - Rated
  - Open ended

Matching questions to objectives

- Make the objective specific

**Objective: Alcohol consumption**

*Q: How many alcoholic drinks did you have yesterday?*
*Q: How many alcoholic drinks did you in the last seven days?*
*Q: How many alcoholic drinks do you have on an average weekday?*
*Q: How many alcoholic drinks do you have on an average weekend?*
*Q: On days when you drink alcohol at all, how many drinks do you have on average?*
*Q: At a meal when you drink alcohol, how many drinks do you have?*

**Objective: Distance from hospital**

*Q: How many miles are you from the hospital?*
*Q: How much time does it take you to travel to the hospital?* (Think of bus transportation, vs. people who own cars, vs. city dwellers, etc.)

*(Objective needs to specify what kind of information)*

All questions above are associated with different kinds of uncertainties and will be understood and answered in different ways by individuals (why we must pilot, see below)
What’s a good question? Some principles and pitfalls to look out for.

Principles: to write a good question or a good survey...

1. Design questions that mean the same thing to all respondents. All the terms should be understandable or defined, time periods specified, complex questions asked in multiple stages.

E.g., Including your visits to psychiatrists, ophthalmologists, and any other professional with a medical degree, how many times have you seen or talked with a medical doctor in the past two months?

*It is important to specify the meaning of “doctor” because some people may exclude doctors like psychiatrists.

E.g., How often do you feel tired during the day—always, usually, sometimes, rarely, or never?

*To what day are you referring? My answer will drastically change depending on whether I’m thinking of a workday, vacation day, or I’m doing some weird calculus to try to mash all these days together.

E.g., “In your household, how are the responsibilities divided up?”

*This is a pretty complex question. Not all respondents will remember to touch upon finances, cooking, inside chores, outside chores, shopping, etc etc. Best to split up the responsibilities and ask about them separately.

Or the classic: “What is your income?”

*Formal income? From all jobs? Including stocks, mutual funds, income from other family members? Best to specify and give a rule for rounding, specifying, etc.

How many times have you eaten butter this week?

*Even the term “butter” can be too broad:
When it is: “How many times have you eaten butter, excluding margarine, this week?” the answers changed significantly (Fowler, 1992)

“How many times were you hospitalized this year?”

*The term is not understandable or is confusing (you’d be surprised at the number of words that confuse people):
Correction: “How many times were you admitted to the hospital as a patient overnight or longer this year?”
Piloting your questions ahead of time helps to identify what is clear and to test alternative wordings (see below, piloting), but you should strive to be extremely clear and focused from the start. Always, if you can, use multiple questions for one complex concept.

2. **Design all aspects of data collection to minimize possibility that any respondent will feel his or her interests are best served by giving an inaccurate answer to a question (more on social desirability bias below)**

3. **Make clear, and standardize the response task. Clearly define the dimension or continuum respondents are to use in their rating task, give them a reasonable way to place themselves on a continuum, or make clear how long or short of an answer is desired or expected in an open ended question. (more on response scale construction below.)**

   \[Q: \text{When did you move to New Haven?}\]
   Potential answers:
   A: 1978
   A: When I became a grad student
   A: After I graduated from college

   Instead:
   \[Q: \text{In what year did you move to New Haven?}\]
   19_ _
   200 _

   Note that some people won’t respect the number of lines you give them for an open ended question (they’ll use the back, ask for another page) but some will respect them too much (they’ll cut their answer short if the line on the page is short.) Give as many lines as you expect length of ideal answer to be. Know that some will go over and under, but the lines communicate your expectation for how much to write.

4. **Asking several questions to get at one concept always increases the “validity” of measurement (actually measuring the concept in question.)**

   *E.g., asking questions about the same thing, just in different ways.*

   Overall, how satisfied or dissatisfied are you with the way democracy works in Ghana?
   1=very dissatisfied;
   2= somewhat dissatisfied;
   3= neutral;
   4= somewhat satisfied;
   5= very satisfied
Choose the statement you agree with more:
A. In Ghana today, we enjoy a real choice among different political parties and candidates.
B. This country is well on its way to becoming a single-party state without real political choice

But beware if you use different kinds of response categories; it is difficult if you want to combine answers into an index. See more below on scales.

5. Questions should ask for firsthand experiences (if accuracy is the objective): beware of asking for secondhand knowledge, hypothetical questions, asking about causality, or asking about solutions to complex problems.

E.g.: hypotheticals: women who have delivered a baby are better at estimating their probability of using anesthesia than women who haven’t delivered a baby.

E.g., causality: we are notoriously bad at explaining our own behavior. See Ross & Nisbett, 1977. Or see the entire field of social psychology circa 1960-2007.

6. Ask one question at a time!! Avoid asking 2 questions, imposing unwarranted assumptions, or hidden contingencies.

“Would you like to be rich and famous?”

*This question confuses people who would like one thing and not the other.

“With the way the Iraq war is going, do you think it’s a good idea to send more troops?”

*These questions are “double barreled” or impose an assumption:
It asks people to accept its premise that the war is going badly before they respond vis-à-vis the troops. This question is unfair to people like Dick Cheney and Karl Rove.

“Are you unhappy with the way you budget your expenses?”

*You are assuming I have a budget. I may be unhappy with the way I spend my money, but if I don’t have a budget, I don’t know how to answer this question.

“In the past month, did you agree to do something your husband asked because you were afraid of him physically?”

*This question has a hidden contingency:
She may have refused to do what he asked, but still been afraid. Or he may not have asked her to do anything.
7. Ask the ultimate question LAST, so it sticks in the mind. I.e., define terms first, and give the response choices last.

NOT:
“Would you say you are not likely, somewhat likely, or very likely to get a job after you graduate?”

“If there was an election today, do you think you would be more likely to vote for Senator Obama or Senator Clinton, considering what’s happened with their campaigns up to this point?”

INSTEAD:
“Which of these categories describe how likely you think you are to get a job after you graduate: not likely, somewhat likely, or very likely?”

“Considering all that has happened with the 2008 presidential campaign up to this point, if there was an election today, do you think you would be more likely to vote for Senator Obama or Senator Clinton?”

People should have the possible answers presented to them right at the end of the question.

8. Measurement is better to the extent that people answering questions are oriented to the task in a consistent way

Generally—the introduction to the survey is delivered in the same manner. Specifically, an introduction to a question is clear and consistent, e.g., CHOOSE ONE or CHOOSE ALL THAT APPLY. Note that people often ignore directions to “choose all that apply” and think that they are supposed to choose only one. People are bad at reading directions. Make directions stick out or make the choices obvious from the way you format. See formatting below.

Pitfalls of writing questions: possible biases

Biasing effect: memory. Thumbnail rules for asking questions that draw on memory:

- Memory for daily, mundane events: Recall deteriorates even after 24 hours. When asked for mundane behaviors over longer period of time, (1 week, 1 month, etc) people average, estimate, guesstimate. Ask for recall of very short period, or ask to keep diary
- Memory for salient events: e.g., visits to doctor: recall deteriorates within six months.
Some tips for stimulating memory:

1. Ask multiple questions. A way of saying “try again”
2. Ask over the course of two interviews; preview questions for next interview to stimulate reflection
3. Ask related questions. For asking about doctor’s visit, also ask “Have you bought any medications recently? Have you had to file insurance?”
4. Provide memory aids, or place them in time. “think of last spring. Were you at the hospital when it was warm outside? Here is a calendar you can look at to help you.”

Biasing effect: Avoiding looking bad, trying to look good, preserving our self image: In short, social desirability.

E.g.: voting and having a library card is overreported, drunk driving underreported

- Assure confidentiality of responses, communicate this to respondent that protection is in place
- Communicate the priority of response accuracy. Some people have asked respondents to verbally or in writing make a commitment to giving accurate answers; interviewers stress “there are no right answers” “we need to know this because of X goal of research”
- Reduce role of interviewer in data collection process
- Use a preamble that minimizes the sense that certain answers will be negatively viewed: “We have found that many people did not vote in this past local election, for many reasons. Did you vote in this past election?” (But be careful; do not create a reverse bias against a positive answer!)
- Allow the respondent to provide perspective on the meaning of the answer using ordering of questions

Q: Did you go to the doctor in the past two weeks?
Q: Did you go to the doctor in the past month? (Loftus, et al., 1991)
People are likely to overreport visits “in the past two weeks” because they want to be seen as “a person who goes to the doctor.” When you allow them a larger time frame first: did you go to the doctor in the past month and then ask the question of interest: did you go to the doctor in the past two weeks you are likely to get a more correct answer.

Q: In general, would you say you drink more than your friends, less than your friends, or about the same amount as your friends?
Q: Think about the friend you know who drinks the most. About how many drinks would you say that person has?
Q: And how about you? On days when you have any alcoholic drinks, about how many drinks do you usually have? (Sudman & Bradburn, 1982)

Here you’ve allowed the person to give context for their answer (e.g., I run with a heavy/non-drinking crowd)
o Provide a scale that shows acceptance of any answer that is potentially viewed negatively:

*Q:* How many sexual partners would you say you have had? None, one, two, three, four, five to ten, eleven to twenty, twenty one to thirty, more than thirty? Not, obviously, “one, two, three, more than three?” Or, leave the line blank, make it open-ended. But note that while broader categories (e.g., thirty to fifty partners) are less informative, they are also less stressful for respondents. More on scale below.

o Ask “list” questions:

“Risk” questions: National Health Interview Survey:

*Q:* Is any of these statements true for you?

  a. You have hemophilia and have received clotting function concentrates since 1977.
  b. You are a native of Haiti or central East Africa who has entered the U.S. since 1977.
  c. You are a man who has had sex with another man at some time since 1977, even one time.

(etc.)

“Random response” method:

  a. Have you used marijuana in the last month?
  b. Is your mother’s birthday in June?

(Subtract % yes responses to unrelated question from % yes responses to all questions, and you have an inferred yes response to the target (sensitive) question, then you can repercentagize responses to target question.)

Or:

*Q.* Take the number of days in the past week in which you have used any marijuana at all and add to that the number of working television sets you have in your home now. What is that sum?

*Q.* How many working television sets do you have in your home now?

Obviously, these approaches only gather population rate

**Biasing effect: positive and negative bias**

Some people see the questionnaire half full and some see the questionnaire half empty. To avoid measuring people’s personal tendencies to answer “yes” or “no” to questions, try to pose roughly half of your attitudinal questions with a positive slant and half with a negative slant.

*E.g.,* Please rate your agreement with each statement:

“*There is a great deal of trust in my community***

“I don’t trust many people.”

If the respondent is going to answer consistently, she will have to agree AND disagree using these two questions. The benefit of this method is that it can also pick up on random answerers--if she agrees to both, you know she is answering randomly (i.e., all yes, all c’s, etc.)
**Biasing effect: Ordering bias**

Sometimes there are distinct sections to your questionnaire, and you think that one may affect the way answers are given to another. For example, one part of my survey asks questions about your mother, and the other asks questions about your romantic partner. Thinking about your mother first may change your responses toward your romantic partner.

*Advice: switch ordering for half of respondent sample; test them to see if the responses vary with the order.*


**Formatting: tips, do’s and don’ts**

(from Aday and Cornelius, 2006)

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. Assign numbers to each question.</td>
<td>Don’t leave off the question number.</td>
</tr>
<tr>
<td>1b. Use letters to indicate subparts of a question when it has more than one part.</td>
<td>Don’t leave off the letter for subparts of a question.</td>
</tr>
<tr>
<td>1a. Do you own a pet?</td>
<td>1b. How many pets do you own?</td>
</tr>
<tr>
<td>Yes……………………………………1</td>
<td>Number: __________</td>
</tr>
<tr>
<td>No……………………………………2</td>
<td></td>
</tr>
<tr>
<td>(If yes):</td>
<td></td>
</tr>
<tr>
<td>1b. How many pets do you own?</td>
<td></td>
</tr>
<tr>
<td>Number: __________</td>
<td></td>
</tr>
<tr>
<td>2. Use a vertical response format for closed-end responses.</td>
<td>Don’t list them horizontally:</td>
</tr>
<tr>
<td>White…………………………….1</td>
<td>White …1 Black …2 Other …3</td>
</tr>
<tr>
<td>Black…………………………….2</td>
<td></td>
</tr>
<tr>
<td>Other…………………………….3</td>
<td></td>
</tr>
<tr>
<td>3. Use numerical codes for closed-end responses</td>
<td>Don’t use alphabetic codes or blank lines to place X or check on, for closed-end responses.</td>
</tr>
<tr>
<td>4. Use consistent numerical codes and formats - e.g. 1 always indicates ‘yes’ on yes/no items, 2 indicates ‘no’, and 8 indicates ‘don’t know’.</td>
<td>Don’t use different codes and formats for comparable responses to different questions; keep it the same!</td>
</tr>
</tbody>
</table>
More formatting tips:

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Align response codes:</td>
<td>Don’t vary alignment of response codes on a page.</td>
</tr>
<tr>
<td>Yes …………………..1</td>
<td>Yes………………1</td>
</tr>
<tr>
<td>No…………………2</td>
<td>No………………2</td>
</tr>
<tr>
<td>Don’t Know………..8</td>
<td>Don’t Know………..8</td>
</tr>
<tr>
<td>White…………………1</td>
<td>White………………………………..1</td>
</tr>
<tr>
<td>Black…………………2</td>
<td>Black………………………………..2</td>
</tr>
<tr>
<td>Other…………………3</td>
<td>Other………………………………..3</td>
</tr>
</tbody>
</table>

6. Provide clear instructions for open-ended items:

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td>What was your blood pressure the last time you had it checked? RECORD HIGH VALUE: ________ (systolic reading) RECORD LOW VALUE: ________ (diastolic reading)</td>
<td>Don’t just leave a space with no instructions for the answer.</td>
</tr>
<tr>
<td></td>
<td>What was your blood pressure the last time you had it checked?</td>
</tr>
<tr>
<td></td>
<td>____________________</td>
</tr>
</tbody>
</table>

7. Provide clear special instructions

(Ask males only):

Did you use a condom?

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Don’t have instructions in the same typeface and format as the question.</td>
</tr>
<tr>
<td>Ask males only: Did you use a condom?</td>
<td>Ask males only: Did you use a condom?</td>
</tr>
</tbody>
</table>

8. Provide clear skip instructions.

8a. Do you smoke cigarettes? 
   Yes (Ask Q. 8b) ……………………1 
   No (Skip to Q 9) ……………………2 

8b. How many cigarettes do you smoke per day on average? RECORD NUMBER OF CIGARETTES: ______ 

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Don’t leave out explicit skip instructions.</td>
</tr>
<tr>
<td></td>
<td>Skip patterns reduce respondent burden!</td>
</tr>
</tbody>
</table>

9. Phrase full and complete questions.

What is your age? _____

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Don’t simply use words or headings.</td>
</tr>
<tr>
<td></td>
<td>Age? _____</td>
</tr>
</tbody>
</table>

10. Use a forced-choice format for a list.

Should an employer be allowed to require job applicants to be medically tested for … (circle answer for yes or no to each.)

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>DON’T use a “check all that apply” or “circle all that apply” format.</td>
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</tbody>
</table>

11. Use a column format for a series with the same response categories.
12. Use a column format for a series with comparable skip patterns.  
   **Do**  
   **Don’t**

13. Put all parts of the question on the same page.  
   **Do**

14. Allow plenty of space on the questionnaire.  
   **Don’t**

15. Carefully consider the overall appearance of the questionnaire.  
   **Don’t**  
   - just start the questions on page 1 without introducing the study, identifying the sponsoring organization, and so on.

16. End the questionnaire with a thank you to the respondent.  

17. Consider how the data will be processed

**Response Scales**

- **Response categories**
  - Make them logical and meaningful:
    - NOT: Many......Some.......A Few.....Very Few.....None
  - Arrange them well in space:
    - NOT:
      - Very helpful
      - Not very helpful
      - Somewhat helpful
      - Not at all helpful

- **Likert scale**
  - Strong scales are clear and provide meaningful gradations:
    - 1. Strongly disagree
    - 2. Moderately disagree
    - 3. Mildly disagree
    - 4. Mildly agree
    - 5. Moderately agree
    - 6. Strongly agree
  - OR
    - 1. Completely true
    - 2. Mostly true
    - 3. Equally true and untrue
    - 4. Mostly untrue
    - 5. Completely untrue

To have a neutral midpoint or not? An ongoing debate between people who say that some people are too likely to give “non-opinions” or otherwise lazily fill out a questionnaire, and those on the other side who say it is not good to “force” people onto one side or the other when they are truly neutral. You should choose which side you agree with based on your research question (e.g., is neutral a meaningful and important category of response?)
• **Semantic differentials**

  E.g., *Rate economists: (mark an “x” your place on the scale)*

  Kind  __ __ __ __ __ __ __ __ __ Mean
  Honest __ __ __ __ __ __ __ __ __ Dishonest

  *Rate lawyers: (mark an “x” your place on the scale)*

  Kind  __ __ __ __ __ __ __ __ __ Mean
  Honest __ __ __ __ __ __ __ __ __ Dishonest

• **Thermometers and visual analogues**

  How warm do you feel toward women?

  Very warm ____________________________ Very cold

  How bad was your pain?

  No pain at all ____________________________ Worst pain I ever Experienced

**Combining questions into scales**

- Ask multiple questions to get at one “complex concept”—e.g., “empowerment” or “reconciliation” (again, check to make sure that a scale for this complex topic does not already exist—that is, one that is reliable and valid according to previous research.)
- This allows for factor analysis, scale development following the survey

**Question ordering**

Ask intimate and demographic questions at the end, after the respondent has “warmed up” to the questionnaire and answered most of the questions.

**Link your questionnaire to other datasets** (GIS, and census, archival datasets)

Think about what “linking data” you need for each individual or community, and collect it: e.g., zip code, address, GIS parameters. Check with Human Ethics committee first to see if you can retain identifying data.

**Piloting your questions:**

1. Field pretest: logistics, and how long does the protocol take? Check to see if there are consistently skipped, unanswered questions
2. “Cognitive interview”: ensure understanding, find out how people go about answering the question, put questions in the vernacular
3. Focus group discussion
Validity of your questions
1. Content validity (can find out through piloting, as above)
2. After piloting or first part of survey:
   a. Analyze resulting data to evaluate strength of predictable relationships among them
   b. Compare alternately worded questions
   c. Compare answers against records, if possible (e.g., test differently worded sensitive questions for known result, e.g. drunk driving)
   d. Measure consistency of answers of same respondents at two points in time.

Data collection

Response rate issues: what to expect, how to shoot for it.
   Based on expectations, remuneration, recruitment methods

Organizing your survey as it comes in: dating questionnaires, numbering them.

References
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Morgan, David L. 1997. Introduction; Focus Groups as a Qualitative Method; and The Uses of Focus Groups, Ch. 1-3 in Focus Groups as Qualitative Research. Thousand Oaks, CA: Sage Publications.


Tourangeau, Roger. 1999. Context Effects on Answers to Attitude Questions, Ch. 8 in Monroe G. Sirken et al. (Eds.) Cognition and Survey Research. New York: John Wiley and Sons, Inc.
