INTRODUCTION TO
QUESTIONNAIRE DESIGN

Workshop In Methods
Spring 2016

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THE ROAD TO A FINISHED INSTRUMENT

Start

Research Question → Focus Groups → Draft Instrument → Expert Reviews (Methodological & Substantive Area)

Cognitive Testing (Round 2) → Revise Instrument → Cognitive Testing (Round 1) → Revise Instrument

Revise Instrument → Pilot → Revise Instrument → Ready to Launch!
Focus group

"Success is ninety-nine percent failure."
—Soichiro Honda

Field pretest
Good questionnaire design involves

- An understanding of how you want to analyze data
- Resources ($$$$), time (can take YEARS!)
- Knowledge of questionnaire design principles

Why go through all of this trouble?

- The data ultimately produced from a survey are only as good as the questionnaire, sample and data collection process that produced them
Do you think the sports media treat African American athletes differently than white athletes?
- YES
- NO
  - 60% of respondents answer “YES”

Do the sports media treat African American athletes the same or differently than white athletes?
- SAME
- DIFFERENTLY
  - 40% of respondents answer “DIFFERENTLY”
Avoiding Measurement Error in the Instrument

Does the instrument actually measure what it is intended to measure?

- When writing and testing your (or evaluating another) instrument, take into critical consideration...
  - Target population
  - Analytic objectives
  - Mode (method of survey delivery) and other operationalization / implementation issues
  - Cognitive aspects of survey response
  - Questionnaire design properties (Top Ten slide)

Consult with stakeholders and experts to identify specific areas of interest and how to ask about them

Find existing questionnaires that you can modify/adapt – most surveys are not copyrighted

Conduct focus groups to learn what your target population thinks is important/how to word questions in ways that will make sense for them
Cognitive Aspects of Survey Methodology

Tourangeau (2000)

**Comprehension**

**Retrieval**

**Judgement**

**Reporting**
- Formatting into response options
- Editing answer

A respondent’s question-answering process
TOP TEN THINGS TO CONSIDER WHEN DRAFTING QUESTIONS

1. Conceptual Variability
2. Problematic Wording
3. Vague Quantifiers
4. Response Options
5. Order Effects
6. Recall/Retrieval Difficulty
7. Estimation Difficulty
8. Attitudinal Questions
9. Sensitive Topics
10. Formatting
#1 – Conceptual Variability

- Words have many meanings:
  - variability across respondents
  - divergence from researcher’s definition

- Suessbrick, Schober & Conrad (2000) administered CPS Tobacco Use Supplement followed by post-test about interpretation:

  Most frequent interpretation held by only 53.8%!

<table>
<thead>
<tr>
<th>Interpretation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only cigarettes you finished</td>
<td>54%</td>
</tr>
<tr>
<td>Cigarettes you finished or partly smoked</td>
<td>23%</td>
</tr>
<tr>
<td>Even just one puff</td>
<td>23%</td>
</tr>
</tbody>
</table>
Do you think children suffer any ill effects from watching programs with violence in them, other than ordinary Westerns?

- Belson (1981) determined that respondents interpreted children, ill effects and violence in numerous ways
  - e.g. “children”: < 8 years, < 19 - 20 years
  - children as students
  - only 8% interpreted question as intended

The “same” question, with some definitions:

- Do you think that children suffer any ill effects from watching TV with violence in them, other than ordinary Westerns? By children I mean people under 14, by ill effects I mean increased aggression at school or at home, increased nightmares, inability to concentrate on routine chores, and so on. By violence I mean graphic depictions of individuals inflicting physical injuries on themselves or others, depictions of individuals wantonly damaging property or possessions, abusive behaviors or language to others, and so on.

- Additional words can clarify intended meaning but this may lead to unwieldy questions, as above.
  - Tradeoff between clarity and complexity
EXAMPLE: College Student Survey

How did you become involved with the Campus at Community College?

☐ I requested information and considered attending, but never enrolled

☐ I previously enrolled in at least one course, but I am no longer enrolled

☐ I am currently enrolled in at least one course

☐ I completed a certificate or degree
AVOID:
- Double-barreling
- Negatives
- Complex syntax
- Hidden assumptions
- Leading questions

Aim for a ~6th grade reading level.

Are you satisfied with our prices and customer service?

Do you favor or oppose not allowing drivers to use cell phones while driving?

Given the world situation, the government protects too many documents by classifying them as SECRET or TOP SECRET. (Agree/Disagree)

How many minutes does it usually take you to commute to work?

In the past month, have you crossed the street from one side to another in order to avoid going near someone you thought was frightening?

Now that you've seen how you can save time, would you buy our product?
B6a. [Programmer Note: Please only ask this question if more than three sources in Question 6 are marked as “Very Important”] You listed the following sources as being very important to helping you learn how to perform your job well:

ANSWER 1: FILL a-g
ANSWER 2: FILL a-g
ANSWER 3: FILL a-g
ANSWER 4: FILL a-g
ANSWER 5: FILL a-g

... 

Of these, which three were the most important in helping you learn how to perform your job well?

1. [DROP-DOWN MENU WITH ANSWERS 1-5…]
2. [DROP-DOWN MENU WITH ANSWERS 1-5…]
3. [DROP-DOWN MENU WITH ANSWERS 1-5…]
#2 — PROBLEMATIC WORDING

**EXAMPLE: College Student Survey**

Please rate your experience of preparing and submitting your application.

- Very simple
- Simple
- Neutral
- Difficult
- Very difficult
BRAIN BREAK...

FOR THE TENTH YEAR IN A ROW, THE EMPLOYEE SATISFACTION SURVEY SAYS MORALE IS LOW.

MANAGERS' BONUSES ARE LINKED TO THESE RESULTS. YOU CAN BE SURE WE'LL MAKE BIG CHANGES...

...TO THE SURVEY.
#3 — Vague Quantifiers

- Non-numerical terms for quantity have different numerical interpretations
  - Belson (1981) found “few” (in over the last few years) meant:
    - “no more than two years” (7/59 respondents)
    - “seven or more years” (19/59)
    - “ten or more” (11/59)

- Particularly problematic in response options
  - e.g. How often do you feel really excited? Very often, pretty often, not too often or never?
  - If R says more than never, Schaeffer & Bradburn asked for number
  - For educated and younger Rs, “pretty often” and “very often” were associated with larger numbers
#3 — VAGUE QUANTIFIERS

**EXAMPLE: College Student Survey**

How useful or not useful was each of the following parts of the orientation? How courses are structured through Canvas.

- □ Was Not in Orientation (N/A)
- □ Not Useful At All
- □ A Little Useful
- □ Moderately Useful
- □ Very Useful
- □ Critical
#4 – RESPONSE OPTIONS

**Why Response Options Matter**
Response Alternatives and Television-Watching (Schwartz & Bienias, 1990)

<table>
<thead>
<tr>
<th>Low Frequency Scale</th>
<th>High Frequency Scale</th>
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<tbody>
<tr>
<td>( ) up to 2 ½ hours</td>
<td>( ) up to 10 hours</td>
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<td>( ) 2 ½ to 5 hours</td>
<td>( ) 10 to 15 hours</td>
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<td>( ) 5 to 7 ½ hours</td>
<td>( ) 15 to 20 hours</td>
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<td>( ) 7 ½ to 10 hours</td>
<td>( ) 20 to 25 hours</td>
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<tr>
<td>( ) more than 10 hours</td>
<td>( ) more than 25 hours</td>
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**Don’t forget to check:**

- Balanced scale
- Likert items – state in fairly strong terms
- Number of response options: 5 to 7? (Krosnick et al.)
- Label all scale points
- Mutually exclusive and exhaustive
- Midpoint (e.g., Neither/Neutral) option?
- “Other (Please Specify)” option?
- “Don’t Know” option?
- “Not Applicable” option?
#4 — RESPONSE OPTIONS
RESPONSE CATEGORIES FOR SCALE ITEMS

- Positivity bias, acquiescence bias
  - [http://www.youtube.com/watch?v=G0ZZJXw4MTA](http://www.youtube.com/watch?v=G0ZZJXw4MTA)

- Numerical labels (-5 to +5, 0 to 10)

- Labeling all scale points and using two-step branching (Rep/Dem, then strength) increase reliability (Krosnick & Berent, 1993)

- Avoid check-all-that-apply items – satisficing problem

- Include response categories at end of the question, not at the beginning

- Rates of change, proportions, percentages – difficult for respondents to report
**EXAMPLE: Grant Survey KY**

* 4. HEALTHCARE SECTOR - For each of the occupations listed below, please indicate the total number of apprentices you anticipate training over the next five years.

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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11+</th>
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<tbody>
<tr>
<td>Certified Nursing Assistant</td>
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<td>Emergency Medical Technician/Paramedic</td>
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<td>Health Information Management Hospital Coder</td>
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<tr>
<td>Healthcare Sanitary Technician</td>
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#5 – ORDER EFFECTS

## Ordering of Questions
- Part/whole effects (marital satisfaction/general satisfaction) – ask general question first
- Related content – Fewer people say taxes are too high when first asked several questions about whether government spending for various programs should be increased

## Ordering of Response Options
- Recency effect: tendency to endorse last option in list – most likely when interviewer reads to respondent
- Primacy effect: tendency to endorse first option in list – most likely when respondent reads to self (self-administered) or predictable scale used
EXAMPLE: College Student Survey

How did you first learn about the Campus?

☐ Professor or Academic Advisor
☐ Workforce system referral
☐ Community College or Campus website
☐ Direct email from Community College or Campus
☐ Social media
☐ Newspaper or other periodical
☐ Radio or television
☐ Word of mouth
☐ Professional Association
☐ My employer
☐ Other (please describe)
BRAIN BREAK...

Hello, this is customer satisfaction survey, are you satisfied? If you say no, you will have to answer too many questions... so suit yourself...

Brains&Stuff.com
When did you purchase your car radio?

Tourangeau (2000)
Recall tasks can involve a complicated process for respondents (cognitive burden)
- Telescoping
- Situating an event between landmarks

More recent, more likely to recall

Greater impact/salience, more likely to recall

Is the respondent in a position to know the answer? (e.g., parent’s income on college student survey)
In the past year, how many times have you seen or talked with a medical doctor or a physician’s assistant about your health?

In the past twelve months, since [DATE], how many different times have you been admitted to a hospital as a patient overnight or longer?

During the past 4 weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed, or irritable)?

How many hours of television did you watch yesterday?
How many hours of television did you watch last month?
In a typical week, how many hours of television do you watch?

Counting, general impressions, and hypotheticals can be difficult for respondents

- Reference period/point
- Ask in a series of questions
- Try a longer question (using familiar words, examples)
#8 — ATTITUDINAL QUESTIONS

Do you think marijuana should be made legal, or not?

On the average, [racial minority] have worse jobs, income, and housing than white people. Do you think these differences are mainly due to discrimination?

How satisfied are you with how your life has turned out so far? Please use a scale of 1 to 10, where 1 is extremely dissatisfied and 10 is extremely satisfied.

- **Factual vs. attitudinal questions**
- **Measuring subjective states of respondents**
  - “No right or wrong answers”
  - May not be fixed
  - No mental “card catalog” of topics
  - Capturing weak attitudes and nonattitudes
  - “…or have you not thought much about this?”
  - Midpoint, No Opinion, Don’t Know options
#9 – SENSITIVE TOPICS

- Sensitive answers

- A short list of topics shown to be sensitive:
  - Pap smears, mammograms, disease prevention, library card ownership, voting, reading, exercise, income, charitable giving, drinking, gambling, sexual activity, illegal activity.
  - Note: List possibly susceptible to culture, time, gender, etc.

- Consider:
  - Emphasize anonymity
  - Use self-administered mode, if possible
  - Placement of questions, e.g. demographics, early or later in questionnaire?
  - Income: try broad ranges, if initially refused.
#9 – SENSITIVE TOPICS

**The Casual Approach**
- Did you happen to murder your wife?

**The Everybody Does It Approach**
- As you know, many people have been killing their wives these days. Did you happen to kill yours?

**The Other People Approach**
- Do you know any people who have murdered their wives? How about yourself?

Do you happen to jog or not? (Gallup)

In talking to people about elections, we often find that a lot of people were not able to vote because they weren’t registered, they were sick, or they just didn’t have time. How about you—did you vote in the elections this November? (ANES)

Some people say that most people can be trusted. Others say you can’t be too careful in your dealings with people. How do you feel about it? (GSS)

Bradburn (2004)
#10 — FORMATTING

| Beverage Description                                                                 | Hot coffee | Hot specialty coffee | Cold or iced regular coffee | Cold or iced specialty coffee | Hot tea | Hot specialty tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Cold or iced tea | Carbonated regular soft drinks | Carbonated diet soft drinks | Fruit juice/juice drink other than lemonade | Lemonade | Vegetable juice | White milk | Flavored milk | Soy/rice milk | Smoothie | Milkshake | Iced drinks (Starbucks, Dairy Queen) | Bottled water | "Free" tap water | Sports drinks (Gatorade, Powerade) | Energy Drinks (Red Bull, Monster) | None of these |
|-------------------------------------------------------------------------------------|------------|----------------------|----------------------------|-------------------------------|---------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|---------------------|-----------------|----------------|-------------|-------------|-------------|----------|----------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|
| Healthy or good for you                                                            |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Packed with vitamins and nutrients                                                 |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Most thirst-quenching/refreshing                                                    |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Can drink any time during the day                                                   |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Most appropriate with breakfast                                                   |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Most appropriate with lunch                                                         |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Most appropriate with dinner                                                        |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Best for drive-thru                                                                 |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Best for a sit-down meal                                                            |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Most appropriate to consume in a company/school cafeteria                         |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| I should be drinking more of this beverage when I go out to eat.                   |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| I should be drinking less of this beverage when I go out to eat.                   |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Goes well with food                                                                |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Is fun to drink                                                                    |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Is a special treat                                                                 |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| A good "snack"                                                                     |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| A good drink to relax with                                                          |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Most appropriate for kids                                                          |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |
| Can't get it at home                                                                |            |                      |                            |                               |         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |                   |                  |                  |                   |                     |                   |                  |

# KEEP IT SIMPLE #
For web surveys:

1. Middle means typical
2. Left and top means first
3. Near means related
4. Up means good
"Of students surveyed, 64% prefer English and 32% prefer math. The fact that these numbers do not add up to 100 may help explain why."
BONUS: TIPS FOR ADMINISTRATION

PAPER QUESTIONNAIRES:
- Include unique ID
- Provide an easy way to return the questionnaire
- Have a plan for data entry
- “Dillman Method"

WEB QUESTIONNAIRES:
- Email message timing matters
- Subject lines matter
- Avoid heavily formatted emails
- Vary length and text of emails
- Use unique survey links
**BONUS: ANALYZING OPEN-TEXT QUESTIONS**

**When Drafting Questions:**
- Limit survey questions to those which can be answered in <500 characters
- Add a general comments catch-all item for anything >500 characters
- Decide if coding for specific topic/theme or letting codes grow out of responses

**When Coding Questions:**
- Use multiple coders to check reliability of interpretations
- Use Cohen’s kappa to assess interrater agreement
- Use a two phase (or more) process
  - Phase 1 – code into broad categories
  - Phase 2 – review and refine into more discrete subcategories.
REFERENCES

Questionnaire design:

Focus groups:

Cognitive interviewing:

Reliability/validity:

Data collection:
- Dillman, D et al. (2009). Internet, Mail and Mixed Mode Surveys.

Analysis of survey data:

Best practices for surveys (while it is written for cross-cultural surveys, many will apply to mono-cultural surveys as well):
- http://ccsg.isr.umich.edu/

Survey quality, overview of survey methodology:
ONLINE SOURCES FOR QUESTIONS

- Google, Google Scholar, academic journal databases to find published scales
- ICPSR: www.icpsr.umich.edu/
- University of North Carolina, Odum Institute: arc.irss.unc.edu/dvn/
- Question Bank for UK surveys: surveynet.ac.uk/sqb/
- Polling the Nations: poll.orspub.com/
- Pew Center: people-press.org/ (question search at top of main page)
- Gallup Polls: brain.gallup.com/
- Roper Center iPOLL databank: www.ropercenter.uconn.edu/data_access/ipoll/ipoll.html
- World Values Survey: www.wvsevsdb.com/wvs/WVSAnalize.jspl
THANK YOU!

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Center for Survey Research
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