Mixed Method Questionnaire Evaluation using Web Probing at the National Center for Health Statistics

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Outline

- NCHS’ Mixed Method Approach to Question/Survey Evaluation
- Web Probing: History and Use
- Case Studies
  - NHIS E-Cigarette Question
  - RANDS during COVID-19 Telemedicine Access Question
- Questions/Discussion
NCHS’ Mixed-Method Approach

- NCHS uses two complimentary methods when examining items for measurement error and comparability:
  1. Cognitive Interviewing
  2. Web Probing/Web Panel-Based Research
- Traditionally, NCHS’ Collaborating Center for Questionnaire Design and Evaluation Research (CCQDER) has used cognitive interviewing almost exclusively.
- Shift to include web panel work over the last ~5 years
Cognitive Interviewing at NCHS

- Examines Validity, Comparability, and Response
  - We focus on identifying the constructs that survey items capture
  - Output is a set of constructs/interpretations that:
    - Survey and subject matter experts can use to determine whether or not the question is suiting their needs
    - Data users can consult to better understand what the final estimates mean
  - We can compare the constructs that certain sub-groups of respondents use to others, to see if there are differences in interpretation or use of answer categories
NHIS Question: Would you say your health in general is excellent, very good, good, fair, or poor?
Why move towards a mixed methodology?

- The point of employing mixed methods is not just to arbitrarily increase the number of methods, but rather to combine methods that help address each others’ limitations.
- Cognitive interviewing is excellent at uncovering patterns of interpretation and response.
- However, it is limited by its sample—we use small, purposive samples that targets recruitment of respondents in a theoretical manner
  - If we’re studying injury, we need to find people who engage in activities where injury is common; if we’re studying opioid use, we need to interview people who have chronic pain or have had surgeries.
Web Probing

- Growing method that uses set cognitive probes on web surveys to expand on findings from offline cognitive testing.
- Probes can be added to “production” surveys, but there are downsides:
  - Cost of questionnaire development/programming
  - Additional burden
  - Potential for framing effects
- The maturation of commercial web survey panels have provided researchers with a low cost/risk way of using this method
Web Probing

- Two basic forms of web probing:
  1. Open-ended collects text data and provides primary qualitative data
     • Attempts to collect comparable data to face-to-face cog interviews
     • Leverages large sample size as compared to CIs
     • Uses a standard/scripted probe, so potentially obtains less nuanced information than CIs
     • Potentially burdensome, with a risk of breakoffs or item non-response
     • Need to be coded
  2. Close-ended collects quantitative data and relies on previous qualitative data
Web Probing

- Two basic forms of web probing:
  1. Open-ended collects text data and provides primary qualitative data
  2. Close-ended collects quantitative data and relies on previous qualitative data
    - Attempts to quantify qualitative findings by administering close-ended questions based on previous CI findings
    - Leverages statistical sample to extrapolate CI findings from a purposive sample to a population
    - Questions appear similar to other survey questions, so less downside than open-ends
    - Requires previous qualitative work; cannot serve as primary source of contextual/interpretative data
Web Probing

- Overall, the goals of both forms are to:
  - Collect meaningful data that assists in questionnaire evaluation
  - Has a neutral impact on the survey response for the other items on the questionnaire
- At NCHS, we prefer the use of close-ended probes...
General Health Question

Health Conditions
- Pain
- Chronic Conditions
- Physical Limitations
- Medicine Use

Health Habits
- Physical Activity
- Vices (Drinking, Smoking, etc)
- Diet
In general, would you say your health is excellent, very good, good, fair or poor?

When you answered the previous question about your health, what did you think of? (Mark all that apply)

☐ My diet and nutrition
☐ My exercise habits
☐ My smoking or drinking habits
☐ My health problems or conditions
☐ The amount of times I seek health care
☐ The amount of pain or fatigue I have
☐ My conversations with my doctor

Question evaluation research: Embedded probes added to RANDS
Question evaluation research: RANDS probe results of general health status question

HEALTH BEHAVIOR
- Diet / Nutrition
- Exercise
- Smoking / Drinking

ACTUAL HEALTH
- Health Problems
- Need for Healthcare
- Pain / Fatigue
- Conversations with Doctor

Patterns of Interpretation of Self-Rated Health Survey Question

- Total, n=2480
- Those with a bachelor’s degree or above, n=973
- Those with less than a bachelor’s degree, n=1507
E-Cigarette Case Study
The next question is about electronic cigarettes or e-cigarettes. E-cigarettes and other electronic vaping products include electronic hookahs (e-hookahs), vape pens, e-cigars, and others. These products are battery-powered and usually contain nicotine and flavors such as fruit, mint, or candy.

Have you ever used an e-cigarette or other electronic vaping product, even one time, in your entire life?

- Yes
- No
Have you **ever** used an e-cigarette or other electronic vaping product, **even one time**, in your entire life?

- [ ] Yes
- [ ] No
What counts as an e-cigarette?

*Please select all that apply.*

- A vape with cannabis, THC, or CBD oil
- A vape with nicotine or other flavored oil
- A hookah-pen or e-hookah
- An e-vaporizer
- A tobacco cigarette or cigar
- A marijuana cigarette
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Prevalence of Patterns of Interpretation of 'E-Cigarette' by Experimental Condition

- CBD/THC Vape: 48.86 Text, 48.75 No Text
- Nicotine Vape: 80.8 Text, 80.39 No Text
- Hookah-pen**: 39.05 Text, 33.69 No Text
- E-vaporizer: 55.24 Text, 56.67 No Text
- Tobacco Cigarette: 11.58 Text, 12.51 No Text
- Marijuana Cigarette: 5.38 Text, 5.38 No Text

Condition: Text vs. No Text

2019 RANDS, n=2646, two-tailed test of proportions *<0.05, **<0.001, ***<0.001
Telemedicine Case Study
In the last two months, has this provider offered you an appointment with a doctor, nurse, or other health professional by video or by phone?

- Yes
- No
- Don’t know
How do you know whether your provider offers telemedicine, or not?
Analysis of the Telemedicine Access Probe

• n=10,855 responses (75.71% item response rate)

• Team of three CCQDER researchers coded all the responses
  - Coding scheme included “Access,” “Use,” “Not sure/Don’t Know,” “Other,” and “Un-codable”

• With this data were were able to:
  - Apply the codes back to the file and do a bit of subgroup analysis
  - And more importantly, construct a close-ended probe for the second round of data collection...