Concurrent Cognitive and Usability Testing: Taking Full Advantage of Pretesting Methodologies

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Paper presented at the Questionnaire Evaluation Standards Conference
Bergen, Norway
May 17-20, 2009
Overview

• Background
  – Cognitive and Usability Labs

• Case Study – U.S. 2010 Census
  – Example 1 – Separate Cognitive and Usability Testing
  – Example 2 – Joint Cognitive and Usability Testing

• Conclusions
Description of Pretesting Methods

• Cognitive Testing
  – Focus on respondent’s understanding of questions
  – Some focus on navigation
  – Often used to determine final question wording

• Usability Testing
  – Focus on user’s ability to complete the survey
    • User = Interviewer
    • User = Respondent
  – Focus on users’ interaction with questionnaire and on visual design (look and feel)
  – Used to improve visual design and navigational controls
U.S. Census Bureau Pretesting Lab Structure

- **Cognitive Lab**
  - Psychologists, sociologists, anthropologists, demographers, etc.
  - Based on CASM and Tourangeau’s 4 stages
  - Measures comprehension, accuracy and ability and willingness to respond

- **Usability Lab**
  - Psychologists, human factors and usability specialists
  - Based on principles of user-centered design (UCD)
  - Measures accuracy, efficiency (time to complete tasks), and satisfaction
Census Bureau Pretesting Lab Techniques

- **Cognitive Lab**
  - Concurrent think aloud
  - Concurrent and/or retrospective probing
  - Retrospective debriefing
  - Vignettes (hypothetical situations)
  - Emergent and expansive probing
  - In-depth ethnographic interviews

- **Usability Lab**
  - Concurrent think aloud
  - Concurrent and/or retrospective probing
  - Retrospective debriefing
  - Scenarios (hypothetical situations)
  - Split panel design
  - Eye tracking
  - Satisfaction questionnaire
Case Studies: United States
2010 Census
U.S. 2010 Census

• Basic demographic questions
  – Name, relationship, age, sex, race and Hispanic origin for each household member
• Mail forms to most households
• Non-response follow-up by personal visit
U.S. Census Nonresponse Followup (NRFU)

• Developed and tested CAPI instrument
  – Usability and cognitive testing independently conducted
  – Example 1

• Turned to PAPI data collection
  – Usability and cognitive testing conducted concurrently
  – Example 2
Example 1: CAPI Instrument Testing

• Usability testing and cognitive testing conducted separately
Separate CAPI Testing Methods

• **Usability**
  – 11 users
  – Can interviewers navigate the instrument?

• **Cognitive**
  – 60 respondents
  – Can respondents understand the questions?
Separate CAPI Testing Findings

- **Usability Findings**
  - Data entry
  - Navigation issues
  - Question text
  - Interview tasks

- **Cognitive Findings**
  - Navigation issues
  - Question text
  - Interviewer tasks
Separate Usability and Cognitive Testing Conclusions

• Separate Testing
  – Some unique results
  – Some redundant results
  – Partial expertise and knowledge of relevant research

• Joint Testing
  – More complete expertise and knowledge of relevant research
  – Able to generate recommendations to resolve problems
Example 2: Joint Cognitive and Usability PAPI Testing

- Paper and Pencil Instrument
- 40 cognitive interviews
- 20 usability sessions
- Concurrent testing leading to development of joint recommendations
Joint PAPI Testing Methods

- Cognitive Testing
  - Respondent-focused
  - Comprehension, accuracy, ability to answer questions given personal situation

- Usability Testing
  - Interviewer-focused
  - Accuracy, satisfaction and efficiency
Joint Findings and Recommendations
Information Sheet

Your Answers Are Confidential

Your answers are confidential and protected by law. All U.S. Census Bureau employees have taken an oath and are subject to a jail term, a fine, or both if they disclose ANY information that could identify you or your household. Your answers will only be used for statistical purposes, and for no other purpose. As allowed by law, your census data become public after 72 years. This information can be used for family history and other types of historical research.

You are required to provide the information requested. These federal laws are found in the United States Code, Title 19, (Sections 9, 141, 193, 214, and 221) and Title 44, (Section 2108). Visit our website at www.census.gov/privacy/ for additional information.

Thank you for your cooperation. The U.S. Census Bureau appreciates your help.

If you have any comments concerning the time it takes to complete this form or any other aspect of the collection, write to Population Redistribution Project, 5600B, U.S. Census Bureau, MHQ3-3014A, 4600 Silver Hill Road, Washington, DC 20233. You may send comments to: Population Redistribution Project, 5600B, U.S. Census Bureau, MHQ3-3014A, 4600 Silver Hill Road, Washington, DC 20233.

Respondents are not required to respond to any information collection unless a valid approval number has been assigned by the Office of Management and Budget. This approval number for the 2010 Census is 0607-0019-C. Approval Expires 12/31/2011.

U.S. Census Bureau

List A

WHO TO COUNT ON APRIL 1st

We need to count people where they live and sleep most of the time.

Do NOT INCLUDE these people: (They will be counted at the other place)

- College students who live away from this address most of the year
- Armed Forces personnel who live away
- People who, on April 1, 2009, were in a:
  - Nursing home, mental hospital, etc.
  - Jail, prison, detention center, etc.

INCLUDE these people:

- Babies and children living here, including foster children
- People who, on April 1, 2009, were in:
  - Nursing home, mental hospital, etc.
  - Jail, prison, detention center, etc.

List B

RELATIONSHIP

- Husband or wife
- Biological son or daughter
- Adopted son or daughter
- Stepson or stepdaughter
- Brother or sister
- Father or mother
- Grandchild
- Parent-in-law
- Son-in-law or daughter-in-law
- Other relative
- Roomer or boarder
- Housemate or roommate
- Unmarried partner
- Other nonrelative

List C

HISPANIC, LATINO, OR SPANISH ORIGIN

- No, not of Hispanic, Latino, or Spanish origin
- Yes, Mexican, Mexican American, or Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, of another Hispanic, Latino, or Spanish origin – For example: Argentine, Colombian, Dominican, Peruvian, Salvadoran, Spaniard, and so on.

List D

RACE

(Choose one or more races)

- White
- Black, African American, or Negro
- American Indian or Alaska Native
- Asian Indian
- Chinese
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian – For example: Hmong, Latvian, Thai, Pakistani, Cambodian, and so on.
- Native Hawaiian
- Guamanian or Chamorro
- Samoan
- Other Pacific Islander – For example: Fijian, Tongan, and so on.
- Some other race
Information Sheet Findings

• Cognitive Findings
  • Respondents understood and were able to use the Information Sheet for all relevant questions

• Usability Findings
  • Interviewers were successful in administering the information sheet and associated questions
Hispanic Origin Question

5. Please look at List C. Is (Name) of Hispanic, Latino, or Spanish origin?

Read it necessary:
Examples of another Hispanic, Latino, or Spanish origin include Argentinean, Columbian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.

☐ No, not of Hispanic, Latino, or Spanish origin
☐ Yes, Mexican, Mexican American, Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, another Hispanic, Latino, or Spanish origin — What is that origin? ☑

List C

HISPANIC, LATINO, OR SPANISH ORIGIN

☐ No, not of Hispanic, Latino, or Spanish origin
☐ Yes, Mexican, Mexican American, or Chicano
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☐ Yes, Cuban
☐ Yes, of another Hispanic, Latino, or Spanish origin — For example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.
Hispanic Origin Findings

• Cognitive Findings
  – Difficulty for Hispanic respondents
    • “Latino” or “Spanish”—without country of origin
    • Describing race and origin
    • Unable to respond *unassisted*
  – With probing by interviewer, able to provide answer

• Usability Findings

<table>
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<tr>
<th>Scenario</th>
<th>Dominican Republic</th>
<th>Columbian</th>
<th>Puerto Rican</th>
<th>Cambodian</th>
<th>Mexican</th>
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<td>Success Rate</td>
<td>95%</td>
<td>95%</td>
<td>100%</td>
<td>95%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Hispanic Origin Discussion and Recommendations

• Respondents had some difficulty, but…
• Interviewers in usability testing were able to successfully navigate the question.
• Recommendations focused on training
Conclusions from Joint Cognitive and Usability Studies

- Understanding of how:
  - Respondents react to questions
  - Interviewers react to questionnaire
  - Interviewers react to respondent situations

- Recommendations
  - Improve the form – question wording, visual design, and/or navigational instructions
  - Improve interviewer training
General Recommendations

- Conduct cognitive and usability testing concurrently with early versions of the questionnaire, with time to change:
  - Question wording
  - Visual design (i.e., format and layout of the questionnaire)
  - Navigational strategies
  - Interviewer training

- Conduct iterative testing
Future Research

- Cognitive and usability testing of American Community Survey Internet data collection instrument
  - Early in development cycle
  - Iterative testing
Thank you!

Questions or Comments?

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