Developing Metrics to Evaluate Streamlined Questionnaire Changes in the Consumer Expenditure Interview Survey

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Outline

- Overview of the Consumer Expenditure (CE) Interview Survey

- Streamlined questionnaire implementation and evaluation

- Defining question text for analysis: considerations and challenges

- Documentation system

- Metrics methodology

- Example changes – Results

- Summary and next steps

Consumer Expenditure Surveys (CE)

- Collect spending data on the U.S. population

- Sponsored by the Bureau of Labor Statistics, collected by the Census Bureau

- Provide expenditure weights for the U.S. Consumer Price Index (CPI)

- Two separate surveys:
  - ▶ Interview Survey
  - ▶ Diary Survey

CE Survey Redesign: Streamlined Questionnaire

■ Objectives of CE redesign

Primary: Address measurement error

Secondary: Reduce respondent burden

■ Streamlined questionnaire features

▶ Reduce the level of detail: aggregate expenditure questions to the extent possible

▶ Records focus: facilitate the use of records, including a records path for certain groups of questions

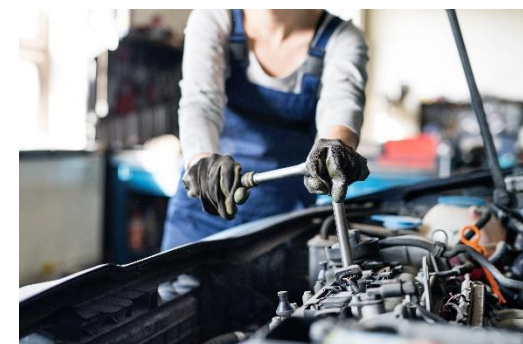▶ Question order/sections: intuitive changes to the order and section organization to improve flow

Streamlined Questionnaire Sections

Phased implementation started in April 2023:

■ Family Care and Education section

▶ Childcare, education, school meals, and adult care

■ Expense Patterns section

▶ Grocery expenses, alcohol and tobacco, food away from home, and gifts

■ Transportation section

▶ Vehicle operating expenses and public transportation

Evaluating Streamlined Questionnaire Changes

- **Have the questionnaire changes made progress toward reducing complexity and length?**
  - Estimate metrics to compare old vs. new wording
  - Focus on text read aloud to respondent
  - Examine changes both at the question level and among questions grouped at the path or section level

- *Separate research will analyze:*
  - Response outcomes to gauge impact on data quality
  - Actual time spent for interviews

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Defining the Question Text for Analysis

Considerations and Challenges

- CE uses a variety of question formats
  - ▶ Including "laundry list questions" where a list of items share a common question stem
- Skip patterns
  - ▶ Reported purchases lead to follow-up questions, e.g., month, amount spent
  - ▶ Follow-ups and their wording vary by item
- New sections integrate items previously in different sections and do not have a direct counterpart for comparison
- Tailored question fills, with wording dependent on household characteristics, previous responses, etc.

Example: Family Care and Education Section

"In this section, I'm going to ask about any payments for education and caring for [family and non-household members/your family, other household members, and non-household members]. Please remember to include payments you made online or by an automatic payment. Please only report your final out-of-pocket payments."

Section Intro

"Since the first of [reference month], not including this month, have [you/you or any members of your household] paid for any –

- Education savings plans, including 529s?
- Daycare, nursery, or preschool tuition or fees?
- Babysitting, nanny services, or other childcare inside or outside your home?
- Elementary through high school tuition or fees?
- Vocational or technical program tuition or fees?
- College or university tuition or fees?
- Housing while attending school? …"

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- "Education savings plans, including 529s?

- Daycare, nursery, or preschool tuition or fees?

- Babysitting, nanny services, or other childcare inside or outside your home?

- Elementary through high school tuition or fees?

- Vocational or technical program tuition or fees?

- College or university tuition or fees?

- Housing while attending school?

- School meals for preschool through college, including meal plans?*

- Private school bus service?

- Purchase or rental of any school books, supplies, or equipment, which has not already been reported?

- Tutoring or test prep?

- Adult day care centers?

- In-home care for convalescing, disabled, or elderly persons, excluding medical care?"

"Was this for... Prepaid tuition plans? Other education savings plans?"

Asked for each item that respondent reports paying for:

"In what month or months did [you/your household] pay for [item description]?"

"How much did [you/your household] pay? Please include any sales tax with the expense."

"Did you pay for any other [item description]?"

School meals item leads to a different set of follow-up questions (e.g., who, how often)

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Documenting Questionnaire Changes

Change Types:

- Section introduction

- Question
  - ▶ Question stem text, along with any instructional or clarifying language read aloud

- Item grouping
  - ▶ Aggregated item list text from laundry lists

- Question set
  - ▶ Captures deletions/additions of follow-up questions

- Section
  - ▶ For sections/subsections with comparable content across questionnaire versions

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Classifying the Purpose of Changes

Purpose Categories:

- Capture information not previously collected
- Disaggregate a 2022 question/response option/item
- Add instructions
- Update language or examples
- Improve specificity

- Reduce number of questions/response options/items
- Simplify language
- Make language consistent across survey
- Match respondent cognition

Metrics – Changes in…

■ Length

▶ Number of words

▶ Number of characters

■ Speaking time

Metrics (cont.)

For Questions, Item Groupings, and Section Introductions:

Changes in...

■ Readability

▶ Flesch-Kincaid Grade Level (FKG)

▶ Gunning-Fog Index (FOG)

■ Text density

▶ Average characters per word

Metrics (cont.)

For Questions, Item Groupings, and Section Introductions:

Changes in…

Comprehension difficulty – based on the Question Understanding Aid (QUAID)

http://quaid.cohmetrix.com/ (Graesser et al. 2006)

■ **Term ambiguity**

▶ Number of words flagged by QUAID as:

- Unfamiliar technical terms
- Vague or imprecise relative terms
- Vague or ambiguous noun phrases

■ **Problematic sentence structure**

▶ Number of sentences flagged by QUAID as having:

- Complex syntax
- Working memory overload

Metrics (cont.)

For Question Sets and Sections:

Defined and analyzed both the **longest** and **shortest** paths possible

Changes in...

■ Length

▶Number of words

▶Number of characters

▶Number of **questions**

▶Number of **sentences**

Example Changes – Metrics Results

Question Example

Transportation section – Vehicle operating expenses laundry list question stem

Old Wording

"Since the first of August, have you or any members of your household **had expenses for any of the following**?"

New Wording

"Since the first of August, have you or any members of your household **paid for any** –"

Metric	Old Wording	New Wording	Change (New - Old)
Length: # of Words	20	16	-4
Length: # of Characters	86	65	-21
Speaking Time (seconds)	10	8	-2
Readability: FKG	9.9	6.9	-3.0
Readability: FOG	14.0	8.9	-5.1
Text Density	4.3	4.1	-0.2
Term Ambiguity (QUAID)	2	1	-1
Problematic Sentence Structure (QUAID)	0	0	0

Item Grouping Example

Comparable items from old Educational Expenses section vs. new Family Care and Education section

Old Wording

- **Preschool or child day care centers?**
- **Tuition, including pre-paid tuition?**
- Housing while attending school?
- Private school bus service?
- **Test preparation or tutoring services?**
- **Purchase of school books?**
- **Purchase of school supplies or equipment not already reported?**
- **Other school related expenses not already reported including the rental of any school books or equipment?**

New Wording

- **Education savings plans, including 529s?**
- **Daycare, nursery, or preschool tuition or fees?**
- **Elementary through high school tuition or fees?**
- **Vocational or technical program tuition or fees?**
- **College or university tuition or fees?**
- Housing while attending school?
- Private school bus service?
- **Purchase or rental of any school books, supplies, or equipment, which has not already been reported?**
- **Tutoring or test prep?**

Metric	Change
Length: # of Words	+7
Length: # of Characters	+25
Speaking Time (seconds)	+3
Readability: FKG	+0.04
Readability: FOG	-4.9
Text Density	-0.3
Term Ambiguity (QUAID)	+2
Problematic Sentence Structure (QUAID)	+4

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Problematic Sentence Structure (QUAID)	+4

Question Set Example

For comparable items from old Educational Expenses section vs. new Family Care and Education section that share the same set of follow-up questions in a given year

Old Wording

- What was the expense for?
- Was this expense for - Someone inside the household? Someone outside the household?
- In what month was the payment made?
- How much was paid?
- Has any of this amount been or will any of it be reimbursed by an employer, agency, or other person?
- Did you make any other payments for [ ]?

New Wording

- In what month or months did your household pay for [ ]?
- How much did your household pay? Please include any sales tax with the expense.
- Did you pay for any other [ ]?

Metric	Change
Length: # of Words	-25
Length: # of Characters	-112
Length: # of Questions	-4
Length: # of Sentences	-3
Speaking Time (seconds)	-12

Summary and Next Steps

- Defining the question text for analysis can present challenges

- Process of documenting changes proved useful in itself

- Data quality improvements sometimes involved adding language, and therefore increasing length
  - Considerations in developing interpretations of the metrics

- Examining multiple metrics provides additional insight

- Future directions:
  - Evaluating data quality, actual time spent for interviews, perceived burden, and respondent comprehension
  - Using metrics during question development process as streamlining continues

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