Measuring Respondent Burden and Its Impacts on Expenditure and Time-Use Estimates

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Acknowledgments

- Collaborators
  - Shirley Tsai (BLS)
  - Ting Yan (Westat, 2014 ASA/NSF/BLS Fellow)
“...respondent burden is not a neat, clearly defined topic about which there is an abundance of literature” (Bradburn, 1978: p49)

“Response burden is not a straightforward area to discuss, measure and manage” (Jones, 2012: p1)
Presentation Objectives

- Assessments of burden in household surveys
  - Objective measures
  - Subjective measures
  - Impacts on survey outcomes

- Applications in 2 BLS surveys
  - Contrasting approaches
    - Directly measuring Rs’ burden perceptions (CE)
    - Using burden proxies (CPS → ATUS)
  - Examine effects of “burden” on survey means, regression estimates, and other DQ indicators

- Concluding remarks
Assessing Burden “Objective” Measures

- Length of the interview
  - Duration
  - # of items asked/answered
- Number of interviews completed
- Number of survey requests
- Number of (known) contact attempts
Assessing Burden
Subjective Measures

- Perceptions of survey characteristics (e.g., item/task difficulty, sensitivity, interest) (Graf 2008; Fricker et al, 2012)
- Negative feelings (e.g., annoyance, frustration or inconvenience) (Frankel, 1980)
- Perceptions of time associated with the response task (Giesen 2012)
Possible Impacts of Burden

- **Unit nonresponse** (e.g., Groves et al. 1999; Rolstad, Adler, and Rydén 2011)
  - Panel attrition (e.g., Martin et al. 2001; Fricker et al. 2011)
  - Delayed responses (e.g., Giesen 2012)
  - Negative evaluations of surveys (Stocke and Langfeldt; 2004)

- **Item nonresponse** (e.g., Warriner 1991)
  - Break-offs (e.g., Galesic 2006)

- **Satisficing/Inaccurate reporting** (Krosnick, 1999; Peytchev, 2005)
BLS Applications
Study 1

- Consumer Expenditure Interview Survey (CE)
  - Longitudinal survey conducted by BLS
    - Provides information on buying habits of American consumers
      • Expenditures, income, consumer characteristics
    - Rotation panel design
      • Panel members are interviewed every quarter up to five times
Burden Measured in CE

- 5th interview is followed by post-survey assessment questions
  - How burdensome was this survey to you?
    - Very burdensome (376)
    - Somewhat burdensome (909)
    - A little burdensome (1049)
    - Not at all burdensome (1006)

- Data for this study: 3,340 cases from October 2012 through March 2013
Number of “Don’t Know” and “Refused” Answers by Level of Burden

*NUMDK: F(3,3336)=10.18, p<.0001; NUMRF: F(3, 3336)=59.36, p<0.0001
Impact of Burden on Reports of Expenditures

- Unweighted mean expenditure by level of burden
- Difference between estimates of mean expenditure with and without the most burdened respondents
Unweighted Mean Expenditure by Level of Burden

*TOTEXPPQ: F(3,3336)=13.94, p<.0001
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of expense categories</td>
<td>14</td>
</tr>
<tr>
<td># of expense categories significantly different across levels of burden</td>
<td>11</td>
</tr>
<tr>
<td># of expense categories with least expenditure amount for &quot;very burdensome&quot;</td>
<td>7</td>
</tr>
<tr>
<td># of expense categories with 2nd least expenditure amount for &quot;very burdensome&quot;</td>
<td>4</td>
</tr>
</tbody>
</table>
## Impact of Burden on Weighted Mean Expenditures

<table>
<thead>
<tr>
<th>Category</th>
<th>WITH (n=3340)</th>
<th>WITHOUT (n=2904)</th>
<th>DIFFERENCE (n=370)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Expenditure</td>
<td>$8636</td>
<td>$8618</td>
<td>$19</td>
</tr>
<tr>
<td>Food</td>
<td>1251</td>
<td>1235</td>
<td>16</td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>65</td>
<td>67</td>
<td>-3</td>
</tr>
<tr>
<td>Housing</td>
<td>2678</td>
<td>2663</td>
<td>15</td>
</tr>
<tr>
<td>Apparel and services</td>
<td>222</td>
<td>225</td>
<td>-3</td>
</tr>
<tr>
<td>Transportation</td>
<td>1656</td>
<td>1660</td>
<td>-4</td>
</tr>
<tr>
<td>Health care</td>
<td>546</td>
<td>546</td>
<td>-1</td>
</tr>
<tr>
<td>Entertainment</td>
<td>400</td>
<td>397</td>
<td>3</td>
</tr>
<tr>
<td>Personal care</td>
<td>50</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Reading</td>
<td>21</td>
<td>21</td>
<td>-1</td>
</tr>
<tr>
<td>Education</td>
<td>252</td>
<td>246</td>
<td>6</td>
</tr>
<tr>
<td>Tobacco</td>
<td>49</td>
<td>51</td>
<td>-2</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>106</td>
<td>110</td>
<td>-4</td>
</tr>
<tr>
<td>Cash contributions</td>
<td>386</td>
<td>391</td>
<td>-5</td>
</tr>
<tr>
<td>Pensions</td>
<td>956</td>
<td>954</td>
<td>2</td>
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</table>
# Impact of Burden on CE Regression Coefficients

<table>
<thead>
<tr>
<th>PSU=1111</th>
<th>DV=log(totexppq)</th>
<th>Model 1 (With “Very burdensome” cases)</th>
<th>Model 2 (Without &quot;Very burdensome&quot; cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept</td>
<td></td>
<td>7.81</td>
<td>0.16</td>
</tr>
<tr>
<td>60 or older</td>
<td></td>
<td>0.28</td>
<td>0.16</td>
</tr>
<tr>
<td>College or More</td>
<td></td>
<td>0.66</td>
<td>0.14</td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td>0.56</td>
<td>0.16</td>
</tr>
<tr>
<td>Single-person Household</td>
<td></td>
<td>0.20</td>
<td>0.19</td>
</tr>
<tr>
<td>R-Square</td>
<td></td>
<td>0.44</td>
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Impact of Burden on CE Regression Coefficients, cont.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Total number of regression models</td>
<td>37</td>
</tr>
<tr>
<td># of models where regression estimates changed</td>
<td>7</td>
</tr>
<tr>
<td>significance level</td>
<td></td>
</tr>
</tbody>
</table>
BLS Applications
Study 2

- American Time Use Survey (ATUS)
  - Sample
    - Individuals age 15 and older from HH that have completed the final (8th) interview of the Current Population Survey (CPS)
    - 1 person in HH selected
  - Timing: typically 3 – 5 months after CPS
  - CATI Interview (24-hour time diary)
    - Person is interviewed once about his/her time on the previous day
    - Rs list activities sequentially, giving type, time information, where they were, and who they were with
Study 2, cont.

- Linkage to CPS provides opportunity to examine variables that may be related to burden among ATUS sample members
  - Respondent concerns captured in CPS Contact History Instrument (CHI)
  - CPS survey data
    - E.g., CPS NR/REF/NC; income NR; contact attempts; same CPS-ATUS respondent
ATUS Analysis

- Univariate and regression analyses examining impact on:
  - ATUS data quality indicators
    - Unit nonresponse; # of activities reported; missing “basic activity” reports (e.g., no personal care or eating + *can’t recall*)
  - Activity duration estimates
    - Selected: work; socializing/relaxing; sleep
    - Included demographic controls (gender, age, education, hours worked, household size, presence of young child)
ATUS Analysis, cont.

- Burden items:
  - CHI-based R concerns
  - ATUS R was CPS R
  - Flag for non-contact in CPS
  - Flag for refusal in CPS
  - Propensity for ATUS noncontact
  - Propensity for ATUS refusal
  - Income missing in CPS
  - # of contact attempts in final CPS interview
<table>
<thead>
<tr>
<th></th>
<th>ATUS NR</th>
<th># of Reports</th>
<th>Missed Reports</th>
<th>Work Time</th>
<th>Leisure Time</th>
<th>Sleep Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI Concerns</td>
<td>7.3%</td>
<td>ns</td>
<td>5.5%</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Same R</td>
<td>8.4%</td>
<td>-2.9</td>
<td>-2.7%</td>
<td>ns</td>
<td>4.0%</td>
<td>1.6%</td>
</tr>
<tr>
<td>CPS NC</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>CPS Ref</td>
<td>14.1%</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>2.1%</td>
</tr>
<tr>
<td>ATUS NC Prop</td>
<td>-2.4</td>
<td>-11.2%</td>
<td>14.0%</td>
<td>ns</td>
<td></td>
<td>3.1%</td>
</tr>
<tr>
<td>ATUS REF Prop</td>
<td>4.9</td>
<td>4.7%</td>
<td>ns</td>
<td>-5.4%</td>
<td>-1.8%</td>
<td></td>
</tr>
<tr>
<td>Income NR in CPS</td>
<td>1.6%</td>
<td>-3.9</td>
<td>ns</td>
<td>ns</td>
<td>3.5%</td>
<td>ns</td>
</tr>
<tr>
<td># of CPS Contacts</td>
<td>4.3%</td>
<td>ns</td>
<td>1.2%</td>
<td>ns</td>
<td>3.8%</td>
<td>-0.4%</td>
</tr>
</tbody>
</table>
Summary

- Self-reported “very burdened” CE Rs had poorer quality data
  - Removing these cases did not change mean estimates or conclusions from regression models
  - Tracking subjective measures of burden could help to reduce survey costs

- Burden indicators from CPS were associated with ATUS final outcome status in expected direction
  - Some evidence of poorer quality reports
  - Impact on activity duration estimates generally small, but we suspect smaller activity categories could be affected more
Conclusions, cont.

- Burden is a subjective phenomenon
- Impact of survey characteristics will be mediated by Rs’ psychological experiences and reactions to those characteristics
- Continued conceptual development of “respondent burden” and its measures is necessary
- Tracking burden can inform design decisions, cost and error considerations
Contact Information

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