Using Paradata to Investigate an Unexpected Production Outcome & Associated Interviewer Behaviors

Shonda Kruger Ndiaye
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Panel Study of Income Dynamics (PSID)

• A national, longitudinal household panel study
• Started in 1968 with 5,000 families
• 38 waves of data collection
• Extensive content: housing, earnings, income, employment, wealth, health, philanthropy, and more
2013 Wave

• 9,107 interviews (2013); 92% RR
• 43 wk data collection—13 wk period of Lab + Field work
• All experienced interviewers—Lab interviewers new to PSID
  – 103 Field (~60% PSID-experienced)
  – 12 Lab (0% PSID-experienced)
• Sample assignment to group not random, but not believed to differ systematically
Interview Length on the PSID

- Closely monitored:
- Known to vary greatly by:
  - Interview type
  - Interviewer PSID experience
  - Also by:
    - Resistance
    - Use of Cell Phone
    - # of Suspends
    - Interview Consent to record status, etc.
Initial Observations on Length Differences

• Length differences apparent as soon as interviews came in.

• Wk 4
  – Field Avg = 83.10
  – Lab Avg = 97.78 (~18% longer)

• No real benchmark for “true avg”
  – Substantial content changes 2011 – 2013
  – 2013 Pretesting w/convenience sample
  – Major q’naire modifications post-pretest
Difference persisted over time:

![Graph showing the difference persisted over time between Field and Lab movements. The graph includes two lines: one for Field with a blue color and one for Lab with a red color. The graph is labeled with the x-axis as Weeks and the y-axis as Minutes. The legend indicates the following: Field, Lab, 3 per. Mov. Avg. (Field), and 3 per. Mov. Avg. (Lab).]
Final Iw Length for 13 wks of Lab + Field

- Field Iws = 5872
- Lab Iws = 341

- Field Avg = 93.41 (StdDev: 31.71)
- Lab Avg = 111.16 (StdDev: 33.38)

- Lab Iws—19% longer
Areas of Investigation

1. Inherent Differences in Sample/Interviews
2. Interviewer Behavioral Differences
3. Technical Differences
Audit Trails/Blaise ADT Files

Definition:

– Automatically generated files with records for each visit to a survey item or Web page:
  • # of visit to the item (page)
  • Start and end time
  • Keystrokes, function keys, mouse clicks
  • Final response/value
Blaise Audit Trail with Keystrokes

**Case ID in Blaise database**

- **Sample ID**
  - 1/17/2012 09:00:06:304 AM, "Enter Form:1", "Key:3975053020"
  - 1/17/2012 9:00:06:304 AM, "Metafile name:C:bpj\proj\HRS2012\work\HRS12.bmi"
  - 1/17/2012 9:00:06:304 AM, "Metafile timestamp:Friday, January 06, 2012 1:08:04 PM"
  - 1/17/2012 9:00:06:304 AM, "WinUserName:14554015"
  - 1/17/2012 9:00:06:304 AM, "DictionaryVersionInfo:0.0.0.0"

- **Start IW**
  - Audit trail file information

- **Question**
  - 1/17/2012 9:00:12:702 AM, "Enter Field:SecA.StartInterview.A007TRAlice_A", "Status:Normal", "Value:"
  - 1/17/2012 9:00:13:965 AM, "(KEY:1[ENTR])"
  - Time of first keystroke

- **Question with changed answer**
  - 1/17/2012 10:02:51:681 AM, "Enter Field:SecJ.WORKSTATUS.J005MCurrEmpStatus[1]", "Status:Normal", "Value:"
  - 1/17/2012 9:02:55:971 AM, "(KEY:15[BACK][BACK][5][ENTR])"
  - 1/17/2012 9:03:03:256 AM, "Leave Field:SecJ.WORKSTATUS.J005MCurrEmpStatus[1]", "Cause:Next Field",
    "Status:Normal", "Value:5"

- **Complete IW**
  - 1/17/2012 9:13:30:056 AM, "Leave Form:1", "Key:3975053020"
Trace movement...

"12/17/2010 1:36:14 391PM", "Enter Field: Section_A.A45a", "Status: Normal", "Value:"

"12/17/2010 1:36:15 796PM", "(KEY:)[SHFT]This is a test[ENTR]"

"12/17/2010 1:36:22 295PM", "Action: Store Field Data", "Field: Section_A.A45a"

"12/17/2010 1:36:22 530PM", "Leave Field:Section_A.A45a", "Cause: Next Field", "Status: Normal", "Value: This is a test"

"12/17/2010 1:36:22 540PM", "Enter Field:Section_A.A45b", "Status: Normal", "Value:

"12/17/2010 1:36:26 578PM", "(KEY:)[UP]"


"12/17/2010 1:36:26 607PM", "Enter Field:Section_A.A45a", "Status: Normal", "Value: This is a test"

"12/17/2010 1:36:31 001PM", "(KEY:)this is another test, changing te[BACK]ext:[ENTR]"

"12/17/2010 1:36:49 948PM", "Action: Store Field Data", "Field: Section_A.A45a"

"12/17/2010 1:36:49 985PM", "Leave Field:Section_A.A45a", "Cause: Next Field", "Status: Normal", "Value: this is another test, changing text."
Disadvantages of raw ADTs

- Running even simple queries takes a lot of time and system resources
- Requires query programming skills
- To be really useful, ADT data should be pre-joined with other paradata
- Thus, we need a fast and flexible query tool that empowers the analyst
  - Must be relatively easy to use, and allow both data exploration and reporting capability
SRO’s ADT OLAP Cube

• Online Analytical Processing (OLAP)
  – Based on multidimensional database
  – Data pre-aggregated at regular intervals

• Uses the ADT database as main source
  – But can supplement with any source data (e.g., sample management system data)

• Data are piped into a new interim database (data warehouse), then cube is built.
1. Inherent Differences in Sample/Interview – Lab vs. Field
Interview Type

• Recontacts and Splitoffs, longer than Reinterviews

• Interview Length differences existed within groups:

<table>
<thead>
<tr>
<th>Type</th>
<th>Overall</th>
<th>Field</th>
<th>Lab</th>
<th>% Longer Among Lab Iws</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recontact</td>
<td>113.3</td>
<td>111.65</td>
<td>236.16</td>
<td>111.52%</td>
</tr>
<tr>
<td>Reinterview</td>
<td>96.84</td>
<td>92.73</td>
<td>110.51</td>
<td>19.17%</td>
</tr>
<tr>
<td>Split from Recon</td>
<td>114.99</td>
<td>111.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Splitoff</td>
<td>113.19</td>
<td>109.34</td>
<td>134.75</td>
<td>23.24%</td>
</tr>
</tbody>
</table>
Interview Type (2)

- Interview type sample distribution:

<table>
<thead>
<tr>
<th>Type</th>
<th>Field</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recontact</td>
<td>1.4%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Reinterview</td>
<td>95.0%</td>
<td>98.0%</td>
</tr>
<tr>
<td>Splitoff</td>
<td>3.5%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

- Distribution favored shorter iws in the Lab
Questions in Interviews

• Distinct Field Count (from ADT)
  – Field Avg/Iw = 507
  – Lab Avg/Iw = 515 (1.62% more)

• Increasing Field Avg Iw Length 1.62%
  – Adjusted Field Iw Length = 94.92
  – Lab Length still ~17% longer
2. Interviewer Behavioral Differences
“Best Behavior” Hypothesis

• Same recording/evaluation protocol across groups, however . . .
  – Lab interviewers are subject to monitoring at any time
  – Field interviewers know which interviews are subject to recording/evaluation
“Best Behavior” Hypothesis (2)

- Avg Iw Length of Field iws consented to record = 101.01
- Avg Iw Length of SSL iws = 111.16
- Lab Iws 10% longer
Use of Notes/Remarks

• Question-level notes
• Some needed and systematically reviewed; others not

• Avg Remarks/Iw:
  – Field—5.7
  – Lab—10.6

• Adjusted to equalize distinct field count—Lab entered ~83% more Notes
Use of Notes/Remarks (2)

• Could calculate time spent typing notes, however, note-taking is also a function of R behavior

• Intervened mid-data collection to clarify use of Notes
Notes per interview

Weeks

Notes per lw

Field
Lab

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Use of Question-Level Help

• Question-by-Question Objectives (Q by Qs)

• Avg Times Q by Qs Used/Iw
  – Field—2.1
  – Lab—4.9

• Adjusted to equalize distinct field count—Lab used Q by Qs 130%
Backups

• Interviewers back up to view/correct previously-entered data

• Diligence or challenges with interview navigation?

• Avg backups/iw
  – Field—35.87
  – Lab—51.18

• Adjusted to equalize distinct field count—Lab backed up ~40% more frequently
Effect of Experience

• 2011 interviewers (all Field):
  – New to PSID Iw Avg Length = ~4% longer than Experienced on PSID

• 2013 Interviewers New to PSID:
  – Field Iw Avg Length = 96.21
  – Lab Iw Avg Length = 111.16
  – Lab Iws ~16% longer
## Experience—Notes, Q by Qs, Backups

<table>
<thead>
<tr>
<th></th>
<th>Notes/Iw</th>
<th>Q by Qs/Iw</th>
<th>Backups/Iw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field</td>
<td>5.72</td>
<td>2.06</td>
<td>35.87</td>
</tr>
<tr>
<td>2011 Experience</td>
<td>5.06</td>
<td>1.97</td>
<td>32.43</td>
</tr>
<tr>
<td>Experience pre-2011</td>
<td>4.54</td>
<td>1.88</td>
<td>28.90</td>
</tr>
<tr>
<td>No PSID Experience</td>
<td>6.75</td>
<td>2.09</td>
<td>40.63</td>
</tr>
<tr>
<td>Lab</td>
<td>10.59</td>
<td>4.88</td>
<td>51.18</td>
</tr>
<tr>
<td>No PSID Experience</td>
<td>10.59</td>
<td>4.88</td>
<td>51.18</td>
</tr>
<tr>
<td>Grand Total</td>
<td>5.99</td>
<td>2.21</td>
<td>36.71</td>
</tr>
</tbody>
</table>
Skipping or Shortening Q Reading

• Could have timed reading of shortest version of certain Qs
• Simpler: % of Questions administered in <2 seconds.
• Complicated due to Q format
  – E.g. date questions with mo/day/year on separate screens
Skipping or Shortening Q Reading (2)

- % of Questions administered in <2 seconds:
  - Field—4.70%
  - Lab—3.12%

- ~33% more in the Field

- Due to greater variance in questions reached among Field iws? (e.g. more mm/dd/yyyy questions)

- Due to real differences in administration?
Skipping or Shortening Q Reading (3)

• Intro to Philanthropy Section
  – Field 84.1 sec
  – Lab 60.2 sec

• Gateway into subsequent Philanthropy questions
  – Field 46.25
  – Lab 52.79

• No evidence so far of skipping or shortening?
3. Technical Differences
Computer Processing Speed

- Lab used desktops; Field used laptops. Could there have been important differences?
- Between-field lengths from ADT
  - $x$ Distinct field count

- Mins of iw length due to processing speed ($w/$distinct field count equalized)
  - Field—1.4
  - Lab—1.7

- Only $\sim 1/3$ min attributable to processing speed differences
Challenges

• Fully understanding meaning of audit trail variables (e.g. unit of measure).
• Properly aggregating audit trail data for each analysis.
• Reaching actionable conclusions in time to inform production.
• If actions driving length adhere to interviewers’ training, what to do?
Suggestions for Next Wave

• Pre-build more interview-length monitoring tools
  – Monitor by more factors up-front
  – Monitor at iwer, question level
• Consider refining interviewer training and/or questionnaire design
  – Find the questions where Lab length is significantly longer. Devote additional training?
  – Legitimize appropriate streamlining