What can we learn from in-app paradata on the active-passive trade-off in smart surveys?

Anne Elevelt, Bella Struminskaya, Maaike Kompier, Daniëlle Remmerswaal & Barry Schouten
UNECE 2023, June 12-14, 2023
Smart surveys?

Smart surveys have at least one of the following smart features:

1. **Device intelligence:** It can use the intelligence (computing, storage) of the device
2. **Internal sensors:** It can employ the sensors available in the device;
3. **External sensors:** It can communicate with other sensor systems;
4. **Public online data:** It can extract publicly available online data;
5. **Personal online data:** It can go online and request access to existing external personal data;
6. **Linkage consent:** It can ask consent to link external personal data already in possession of the survey institute.

UNECE, June 13, 2023
Why smart surveys?

Survey themes that satisfy one or more of following:

1. **Burden**: The survey topic(s) are burdensome for a respondent (time or cognitive effort);
2. **Centrality**: The survey topic(s) are non-central to respondents;
3. **Non-survey type**: The survey topic(s) do not lend themselves to a survey question-answer approach to begin with;

→ reduce drop-out, satisficing, measurement error, improve validity.

Active data collection = Respondents are involved in interpretation of the smart task, retrieving information through the smart task, judging the smart data, and/or submitting the smart data.

BUT ARE RESPONDENTS MOTIVATED, ABLE AND COMPETENT?
### In-app logdata on navigation/clicking behaviour

<table>
<thead>
<tr>
<th>userName</th>
<th>action</th>
<th>objectName</th>
<th>time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>LoginScreen</td>
<td>2021-09-10 13:29:25</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>Menu</td>
<td>2021-09-10 13:30:11</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>StartQuestionnairePage</td>
<td>2021-09-10 13:30:11</td>
</tr>
<tr>
<td>1234567</td>
<td>close screen</td>
<td>StartQuestionnairePage</td>
<td>2021-09-10 13:34:59</td>
</tr>
<tr>
<td>1234567</td>
<td>openTab</td>
<td>ReceiptListScreen</td>
<td>2021-09-10 13:35:50</td>
</tr>
<tr>
<td>1234567</td>
<td>openTab</td>
<td>ReceiptListScreen</td>
<td>2021-09-10 13:35:56</td>
</tr>
<tr>
<td>1234567</td>
<td>openTab</td>
<td>OverviewScreen</td>
<td>2021-09-10 13:35:58</td>
</tr>
<tr>
<td>1234567</td>
<td>openTab</td>
<td>ReceiptListScreen</td>
<td>2021-09-10 13:36:00</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>ManualEntryScreen</td>
<td>2021-09-10 13:36:20</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>SearchWidget</td>
<td>2021-09-10 13:36:23</td>
</tr>
<tr>
<td>1234567</td>
<td>close screen</td>
<td>SearchWidget</td>
<td>2021-09-10 13:36:29</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>DiscountDialog</td>
<td>2021-09-10 13:37:14</td>
</tr>
<tr>
<td>1234567</td>
<td>close screen</td>
<td>DiscountDialog</td>
<td>2021-09-10 13:37:22</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>DatePickerController</td>
<td>2021-09-10 13:37:44</td>
</tr>
<tr>
<td>1234567</td>
<td>close screen</td>
<td>DatePickerController</td>
<td>2021-09-10 13:38:49</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>ManualEntryInformationIncompleteDialog</td>
<td>2021-09-10 13:39:04</td>
</tr>
<tr>
<td>1234567</td>
<td>close screen</td>
<td>ManualEntryInformationIncompleteDialog</td>
<td>2021-09-10 13:39:11</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>SearchWidget</td>
<td>2021-09-10 13:39:19</td>
</tr>
<tr>
<td>1234567</td>
<td>close screen</td>
<td>SearchWidget</td>
<td>2021-09-10 13:39:23</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>SearchWidget</td>
<td>2021-09-10 13:39:41</td>
</tr>
<tr>
<td>1234567</td>
<td>close screen</td>
<td>SearchWidget</td>
<td>2021-09-10 13:39:45</td>
</tr>
<tr>
<td>1234567</td>
<td>showTutorialManualEntry</td>
<td>InkWell</td>
<td>2021-09-10 13:40:15</td>
</tr>
<tr>
<td>1234567</td>
<td>nextTutorialPage</td>
<td>InkWell</td>
<td>2021-09-10 13:40:33</td>
</tr>
<tr>
<td>1234567</td>
<td>nextTutorialPage</td>
<td>InkWell</td>
<td>2021-09-10 13:40:38</td>
</tr>
<tr>
<td>1234567</td>
<td>open screen</td>
<td>ClosingScreenWarning</td>
<td>2021-09-10 13:40:42</td>
</tr>
</tbody>
</table>
Example analysis – Household Budget Survey

RQ: How much time do respondents spend in-app?

![Graph showing total in-app time per day](Graph.png)

UNECE, June 13, 2023
Example analysis – Household Budget Survey

RQ: Does allowing to edit scanned (e-)tickets help?

<table>
<thead>
<tr>
<th></th>
<th>With editing</th>
<th>Without editing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct amount</td>
<td>7.8%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Difference amount &lt;= 1 Euro</td>
<td>63.9%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Correct number of products</td>
<td>27.6%</td>
<td>16.1%</td>
</tr>
<tr>
<td>Difference number of products &lt;=1</td>
<td>43.5%</td>
<td>45.5%</td>
</tr>
<tr>
<td>No zero amounts</td>
<td>38.0%</td>
<td>18.5%</td>
</tr>
</tbody>
</table>

UNECE, June 13, 2023
Example analysis – Household Budget Survey

RQ: Do respondents look at tutorials?

Average number of shown tutorial over time

Number

0.0

0.1

0.2

0.3

0.4

0.5

Number of days into the study

0

2

4

6

8

10

12

14

Shown Tutorials

UNECE, June 13, 2023
Example analysis – Mobility Survey

RQ: What edit actions on stops – tracks are done?

<table>
<thead>
<tr>
<th></th>
<th>One day sample</th>
<th>First day of seven day sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All actions</td>
<td>Limited editing</td>
</tr>
<tr>
<td>Time in-app (seconds)</td>
<td>58</td>
<td>41</td>
</tr>
<tr>
<td>Nr of sessions</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Nr of messages</td>
<td>62</td>
<td>44</td>
</tr>
<tr>
<td>% User-entered</td>
<td>6.2</td>
<td>NA</td>
</tr>
<tr>
<td>Mean nr tracks</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>Mean nr stops</td>
<td>3.5</td>
<td>3.4</td>
</tr>
<tr>
<td>% labeled stops</td>
<td>81%</td>
<td>71%</td>
</tr>
<tr>
<td>% labeled tracks</td>
<td>76%</td>
<td>68%</td>
</tr>
</tbody>
</table>
Example analysis – Mobility Survey

RQ: How does battery management affect geotracking?

UNECE, June 13, 2023
Discussion

- In-app logdata can be very useful in smart (diary) surveys to evaluate problematic (smart) tasks, BUT
  - Data generally large in size and warrants hypotheses
  - Only partially structured
  - Hard to separate inability from lack of motivation

- Research on how to structure and detect ‘breaking points’ in active-passive trade-offs
- Others doing similar studies?

Contact: jg.schouten@cbs.nl

UNECE, June 13, 2023