Data collection using mobile technologies: Changes over time in the barriers to participation

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Smartphones (SP) increasingly used for data collection

Examples:

- App tracking device use
- Movement
- GPS tracking
- Geo-triggered survey
- Browser based survey
- App quaire/diary
- EMA
- Photos
Participation in SP studies still low

Many stages at which drop-out occurs:

- Continues task
- Installs app / sets up account / turns sensors on
- Is able and willing
- Has compatible device
Why do / don’t people participate in SP studies?
Predictors of actual participation in SP tasks

- App to scan shopping receipts and enter purchases
  - *Understanding Society* Innovation Panel
  - Probability sample of households in Great Britain
  - 2016

- Predictors of participation:
  - Has a device
  - Frequency of device use
  - **Hypothetical willingness** to download an app for a survey
  - Cooperativeness with the survey (consent, item non-response)

Source: Jäckle, Burton, Couper & Lessof (in press) *Survey Research Methods*
Hypothetical willingness to participate

Varies between different types of tasks:

Source: Wenz, Jäckle & Couper (in press) *Survey Research Methods*
See also Revilla, Couper, & Ochoa (2018); Revilla, Toninelli, Ochoa, & Loewe (2016)
Predictors of willingness to participate in different tasks

Empirical tests:
- Significant predictors across different types of tasks

Source: Figure 1 in Wenz, Jäckle & Couper (in press) Survey Research Methods
In sum….

- Key known predictors of participation:
  - Has device
  - Frequency of device use
  - Intensity of device use (# activities)
  - Hypothetical willingness to do SP tasks for survey
  - Security concerns about providing info via SP features
Population trends

- Increasing…
  - Smartphone ownership
  - Intensity of smartphone use
  - Technical capability of devices

- But also public events that might increase data security concerns, e.g.
  - Cambridge Analytica
  - GDPR legislation
The big questions

• What is the future scope of smartphone based data collection?
• Is participation likely to increase?
• Is selectiveness of who participates likely to decrease?

Here: use panel data to examine…

• **RQ1:** How are predictors of participation changing?
• **RQ2:** How are selection biases changing?
Data

- **Understanding Society Innovation Panel**
  Probability sample of households in Great Britain
  All household members aged 16+ interviewed annually
  Since 2008

- **Repeated questions about mobile device use**
  2016: n=1,884
  2017: n=2,212
  (2018 still in field)

- **Analysis sample**
  Balanced panel: n=1,762
RQ1: How are predictors of participation changing?

Within individual changes (2016-2017):

- **Has smartphone**
- **Uses smartphone every day**
- **Little or no concern about downloading tracking app**
- **Very willing to download tracking app**

Legend:
- Never
- Move off
- Move on
- Always
RQ2: How are selection biases changing?

• **Stages of selection**
  1. Coverage (has a smartphone)
  No longitudinal measures of participation – instead:
  2. Willingness (conditional on having smartphone)
  3. Total bias (willingness in full sample)

• **Example:**
  Willingness to install app that tracks smartphone usage
Coverage and willingness to install tracker app

Aggregate rates:

- **Has smartphone**
- **Willing to install tracker app (conditional on smartphone)**
- **Willing to install tracker app (full sample)**
Coverage, willingness and total bias

- Respondent characteristics tested for bias
  - Gender
  - Age
  - Education
  - Personal monthly income
  - Subjective assessment of financial situation
  - Whether in work (employed/self-employed)
  - Travel to work time (if in work)
  - Long-term disability or health problem
Bias example

Respondents with long-term health problem or disability under-represented at all stages:

- **Coverage bias**
  - % of users – % of full sample

- **Willingness bias** (conditional on coverage)
  - % of willing – % of users

- **Total bias**
  - % of willing – % of full sample

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<th>Year</th>
<th>Percentage Points</th>
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Average absolute bias
Across 8 variables (26 categories)
Conclusions

• Barriers to participation in SP studies
  Decreasing somewhat
  But also lot of within-individual change

• Biases related to coverage and willingness to participate
  Small decreases, remain persistent
  Often reinforce each other

• 2018 data
  Trends over longer time period?
More information

- Project webpage:
  
  [https://www.iser.essex.ac.uk/research/projects/understanding-household-finance-through-better-measurement](https://www.iser.essex.ac.uk/research/projects/understanding-household-finance-through-better-measurement)