Understanding Society
THE UK HOUSEHOLD LONGITUDINAL STUDY

# Quantifying the impact of web mode on analyses of data from Wave 8 of *Understanding Society*

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# Survey Mode

- Survey mode – how the survey is administered/data are collected
- Interviewer-mediated: e.g. face-to-face, telephone
- Self-administered: e.g. postal, online via web
- Surveys occasionally use more than one mode

# *Understanding Society*

- Predominantly face-to-face interviews (augmented by self-completion and telephone)

- Move to web mode:
  - Technological and cultural changes have normalised use of web browsers and mobile apps
  - Promise of reduced costs (savings on interviewers) as funding squeezed
  - Promise of improved response rates by minimising inconvenience for participants

# What Are the Issues?

- Participants' answers differ depending on the mode used to administer the question
- Mode also influences whether participants respond – to specific questions or at all
- The impact will not be the same for every question

# Question Types

- Interviewer effects
  - Fear of disclosure
  - Social desirability
  - Positivity
- Satisficing
  - Participants minimise the work needed by providing a ‘good enough’ but incorrect answer
- Presentation
  - Ranking, multi-option answers, mid-point scales, primacy/recency effects, straight-lining in question batteries

# Mode Effect Risk Assessment

- Working paper by D'Ardenne et al. (2017)

  "Review of proposed survey questions for waves 7-10 of Understanding Society" Understanding Society WP 2017-04

  https://www.understandingsociety.ac.uk/research/publications/524254

- Full spreadsheet of results

  https://www.understandingsociety.ac.uk/files/working-papers/2017-04-appendix.xlsx

Table 4-3 Total number of questions rated as being at risk of mode effects

| | Risk of interviewer effects | Risk factors for satisficing | Risk factors for question and answer presentation effects | Final risk rating of any mode effect |
|---|---|---|---|---|
| No risk | 1044 | 980 | 799 | 405 |
| Low risk | 336 | 450 | 496 | 758 |
| Medium risk | 88 | 56 | 184 | 299 |
| High risk | 18 | 0 | 6 | 24 |

## Summary of Risk Assessment

D'Ardenne et al. (2017) Understanding Society WP 2017-04

# Two Questions

- Vulnerable because risk of satisficing

  `hworkdis` – Distance live from work

  Assessed as low risk

- Vulnerable because of risk of positivity bias

  `hdebty` – Amount in debt (v. skewed)

  Assessed as high risk

# Mode Effect on Measurement

- Basic mode effect: Hypothetical difference between a) your answer had you been interviewed face-to-face and b) your answer had you completed the questionnaire online – **one is unobserved/'counterfactual'**

- More complex: Difference between estimates (i) you would have obtained had everyone been interviewed face-to-face and (ii) everyone had completed via the web – **myriad such effects: we can't measure every one!**

# Different to Measurement Error

- Measurement error is difference between the measured responses and the ‘truth’: there is no truth here, only the difference between different answers
- Not trying to measure ‘reliability’ – just estimate **what we would have got had we not introduced web mode**
- Face-to-face (F2F) is not necessarily the best mode: mode effects **NOT** necessarily = poor data quality

# Mode Effect on Non-response

- Basic mode effect: Hypothetical difference between your actual non-response status and whether you would have non-responded had you been allocated another mode (unit/item)
- More complex: Do the factors influencing non-response differ by mode (need to e.g. recalculate survey weights)?
- Not the subject of this presentation

Make the “representativity assumption” (Vannieuwenhuyze 2015)

# Estimating Mode Effects

- Selection effects: If people free to choose, the characteristics of those choosing Web may differ from those choosing F2F
- Difference between web responses and F2F responses **not** valid estimate of simple mode effect – mixes up selection and mode effects
- Need to adjust for selection effects

# Adjusting for Selection Effects

- Need to know which people would disproportionately choose web mode:
  - Good starting choices (**C**): gender, age, education, income?
- Need measures of these factors obtained *using the same mode* for everyone
  - No problem if measures from Waves 1–7 but not otherwise
- Adjust for these vars to estimate mode effects

# Indicator Method

- Estimating the mean of mixed-mode var Y (binary or continuous)
  - Regress Y on M and **C**
  - M = 1 if Web, M = 0
  - Coefficient of M is mode effect on mean
- Effect of X on Y (regression coefficient of X)
  - Safe if X is ‘single-mode’ variable (some issues otherwise)
  - Regress Y on X and **C**
    **and** M and X.M interaction
  - Interaction coefficient is mode effect

# Imputation Methods

( Kolenikov & Kennedy 2014; Park, Kim & Park 2017)

- F2F response is ‘missing’ for those choosing Web
  - Impute these values using observed F2F responses
- Multiple imputation to calculate standard errors
  - For all types of variable, all types of model
  - Combines the **Is there a mode effect?** and **Does it make a difference?** questions, at a price:
  - Complex (especially for multivariate analyses) and difficult to implement for ‘lay users’
  - As usual with imputation, it can make matters worse if badly done

# Drawbacks

- For both, control variables must be added to adjust for selection effects
- But what if we have omitted important factors driving selection because these are *unknown*, *unobservable* or *unobserved*…?
- To get around this, an experiment using randomisation is needed…

# Wave 8 Experiment

- Randomise participants to Web or F2F
  - We cannot force participants to accept their assigned mode
  - No point with everyone: we already have some idea of those who'd be unlikely to participate if assigned to web
  - Others were not present at Wave 7: try web to persuade them to return
- Use a 'sequential design'
  - Each household randomised to Web or F2F
  - If individuals object, they are offered the other mode
  - Telephone is the last resort for those refusing both
- Non-compliance is different to selection if chose freely

# Allocations

- Only showing data from quarters 1, 2 and 4 here
  - Focus on sequential expt. Randomised household
  - Result: 9783 individuals: 5866 (60%) to Web; 3917 (40%) F2F
- 3347 in Ringfenced sample, remainder ignored here
- Focus on choice/non-compliance:
  - Allocated F2F: 216 chose Web, 3660 chose F2F
  - Allocated Web: 3933 chose Web, 1858 chose F2F
  - Total interviewed Web 4149 (43%), F2F 5518 (57%)

# Instrumental Variables (IVs)

- Not a ‘pure’ experiment but can still estimate mode effects because household randomisation is an “IV”:
  - Unrelated to household’s/individual’s characteristics
  - Proportion choosing Web among those randomised to Web must be different to prop for those randomised F2F
  - It is: **68%** (among web-allocated) versus 6% (F2F)!
- Can estimate different sorts of mode effects
  - Mean & variance of a single variable
  - Association between a ‘mixed-mode’ and ‘single-mode’ variable
  - Covariance between two mixed-mode variables, etc.

# Results: Distance from Work

- Mean
  - Mixed-modes mean: 11.3 miles from work
  - Unadjusted association: Web respondents +2.68 (0.8) further
  - IV estimate: Difference between Web and counterfactual F2F is 2.92 (1.2) among those choosing web
- Variance/Standard Deviation (SD)
  - Mixed-modes SD: 28.3
  - Unadjusted ratio of SDs for web and F2F respondents: 36.6 / 17.4 = x2.1
  - IV estimate: web respondents' SD is x2.7 larger than had their F2F responses being used

# Results: Total Debt

- Mean
  - Mixed-modes mean: 8.01 log(£)
  - Raw association: Web respondents 0.22 (0.08) more debt **sig**
  - IV estimate: Difference between Web and counterfactual F2F is – 0.06 (0.1) among those choosing web **non-sig**
- Standard Deviation (SD)
  - Mixed-modes SD: 2.00
  - Unadjusted ratio of SDs for web and F2F respondents: 1.99 / 2.04 = x1.0 **non-sig**
  - IV estimate: Ratio s x1.11 larger than counterfactual F2F (but CI 0.9 – 1.4 includes 1) **non-sig**

# Results: Associations

- Single-mode X: Age (0 if < 40, 1 if > 40)
- `hworkdist`

  Over 40s live 2.14 (0.8) miles further away than under 40s

  Difference in mode effects –0.92 (2.5) is **non-sig**
- `log(hdebty)`

  Over 40s debt is –0.38 (0.1) less than under 40s

  Difference in mode effects –0.16 (0.3) is **non-sig**
- Covariance between `hworkdist` and `dhdebty`

  IV estimate: covariance 1.15 (2.2) higher among web responses than F2F ones for those choosing web: **non-sig**

# Recommendation for Practice

- Consult risk assessment to identify troublesome vars
- **Is there a mode effect** Estimate using IV methods
- **Does it make a difference** Advice on adjusting results for simple models in our forthcoming WP!
- Generally, and simply, see the User Guide:

  https://www.understandingsociety.ac.uk/sites/default/files/downloads/documentation/mainstage/user-guides/mainstage-user-guide.pdf

  Pages 14-16 on experimental design

  Guidance for analysis (pp. 101-102): run your analysis on full sample and on ringfenced subsample `h_ringfence == 1`: smaller sample size but very robust!

# Further Work

- Clarke, Bao et al. (2019) WP forthcoming

  Review and critique existing methods

  Description of IV estimation for mode effects (using gmm routine in Stata) and efficient estimation of standard errors (incorporating survey weights and design)

  Mode effect adjustments for simple models based on these results: nothing quick and simple for general forms of analysis is possible, however ☹

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