Analyzing Online Survey Experiments

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Sequential Blocking, Mode Effects, and the Power of Moral Arguments

PhD Dissertation Prospectus Defense

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13 April 2018

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Outline

- Methods dissertation about online survey experiments
- Three papers
  - Two quantitative methods contributions
  - One application in American Politics
- Paper I: Improving Balance in Online Survey Experiments
- Paper II: Uncovering Mode Effects in Online Survey Experiments
- Paper III: Moral Arguments as a Source of Frame Strength

Paper I: Improving Balance in Online Survey Experiments

I: Overview

- Problem:
  - Majority of online surveys use Qualtrics to design questionnaire
  - Qualtrics only offers complete randomization
  - Fine for large samples, but not for small samples
  - Large samples are expensive
- Solution
  - Sophisticated method of randomization called sequential blocking
  - Software tool that makes this method applicable to other researchers

I: Complete Randomization and Blocking

Table 1: Randomization in Experiments

Unit Characteristics Are Known	Unit Characteristics Are Not Known
Complete Randomization	Complete Randomization
'Nonsequential' Blocking	———
———	Sequential Blocking

I: Sequential Blocking

- Covariate-adaptive randomization (CAR)
  - Varies probabilities of assignment based on knowledge about previous units and the current unit
- Basic CAR
  - Biased coin
  - Minimization
- Advanced CAR
  - Continuous variables
- My contribution: CAR for ordinal outcome variables

I: Software Tool

- R package
  - Creates questionnaire that can be directly fielded online
  - Applies sequential blocking method
  - Freely available to other researchers
- MTurk
  - Package designed to be linked to MTurk to recruit participants
- Qualtrics
  - Free, more sophisticated alternative to Qualtrics

I: Data Applications

- Simulations
  - Sequentially block using the mean Mahalanobis distance
  - Complete randomization with same settings
- External
  - Studies that use complete randomization and OLS covariate controls
  - Sequentially block respondents in the data
  - Order of observations is sequential entry order
  - Example: Tomz and Weeks (2013)
- Original
  - Online survey experiment in paper III
    - Once with sequential blocking
    - Once with complete randomization

Paper II: Uncovering Mode Effects in Online Survey Experiments

II: Overview

- Problem
  - Online surveys are popular, fast, cheap
  - BUT: Changing modes influences how respondents answer questions
  - Lots of research, we know lots of differences
  - BUT: Is there a measurement error in the form of a critical distributional difference in aggregate survey responses?
- Solution
  - Entropy measure
  - Describes measurement variability in categorical questions
  - Measures of variance that assume continuous data (i.e. SD) not suitable
  - How respondents react to identical questions in different survey modes
  - Only applied to comparison between face-to-face and online so far

II: Pathologies of Online Surveys

- Sampling error
- Nonresponse
- Social desirability
- Satisficing
- Total survey error

Entropy Measure

- Evidence of effect of mode differences on survey responses is mixed
- Traditional statistical measurements (variance, median average deviation) robust to ordinal data with equally spaced distances
- Most surveys and survey experiments have non-equally spaced ordinal data
  - Likert scale of support
  - Ideology measure
- Entropy measure H, for a given discrete variable $f(X) = [p_1, p_2, ..., p_k]$:

$$H = -\sum p_i ln(p_i), \sum p_i = 1$$

p_i: observed counts for each possible answer category of survey variable

II: Data Applications

- External
  - Data sets that field identical questions on the phone and online
  - Examples: ANES 2016, Pew surveys
- Original
  - Online survey experiment in paper III
  - Complementary RDD survey through TESS

Paper III: Moral Arguments as a Source of Frame Strength

III: Overview

- Problem
  - Framing shown to have effects
  - Some frames work, others don't
  - We don't know what makes a frame strong
- Solution
  - Moral arguments could form part of frame strength
  - Moral arguments as the key IV

III: Framing and Moral Arguments

- Framing
  - Presenting an issue in certain terms to influence how people perceive it
  - Changed level of issue support as a result of frame exposure
  - Mixed findings on sources of frame strength
- Moral arguments
  - Based on ethics, fairness, equality
  - Important force in shaping public opinion
  - Moral Foundations Theory

III: Data

- Preliminary analyses
  - Meta-Analysis of experimental framing studies
  - Online poll to test strong frames from previous studies on moral content
    - Fielded on MTurk
  - Focus group on how people define moral arguments
    - Fielded with DC company
- Main analysis: Online survey experiment to test power of moral arguments
  - Design complementary nonmoral frames to strong frames from studies
  - Pre-test designed frames on MTurk
  - Field questionnaire on MTurk with sequential blocking (Paper I)
  - Analyze entropy results in identical survey fielded on TESS (Paper II)

Thank you!