Mixed-Mode Designs for Social Surveys:
Introduction and Overview

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Early Practice

"Mixed mode surveys, that is, surveys that combine the use of telephone, mail, and/or face-to-face interview procedures to collect data for a single survey project are occurring with increasing frequency. A second, or in some cases even a third, method to collect data for a single survey is being used throughout the world…. Indeed, mixed mode is becoming one of the survey buzz words of the late 20th century"

Dillman & Tarnai, 1988

- Important goals then
  - Coverage (telephone), dual frame sampling
  - Nonresponse follow-up
- Important Issues already identified by Dillman & Tarnai
  - Data comparability
  - Questionnaire construction

At Present

- The norm and expected to increase….
  - Tourangeau 2015. 2017, Blyth 2008; Biemer & Lyberg, 2003
- Many forms
  - *Contact* by different mode
    - Recruitment probability based online panels (Blom et al, 2015)
    - Special letters (e.g., with incentive, push to web) (Dillman, 2017)
  - Another mode for *specific questions* for all respondents
    - Self-administered forms for sensitive questions
    - Direct observations (e.g., GPS signal)
  - Different *response modes* for different (groups of) respondents
    - Concurrent (e.g., international surveys, special groups)
    - Sequential (e.g., nonresponse follow-up)
  - Alternating modes in longitudinal design

Common Mixed-Mode Designs Data Collection

- Cross-sectional
  - Offer two or more modes at same time
    - To overcome coverage problems
- Cross-national (& cross-cultural)
  - Different countries have different traditions main modes

Concurrent Mixed Mode

- Cross-sectional
  - Start with cheapest and follow-up with more expensive to reduce nonresponse
- Longitudinal mixed-mode or panel
  - Start with expensive high response mode
  - First contact formation online (probability) panel

Sequential Mixed Mode

Why? We Need To!

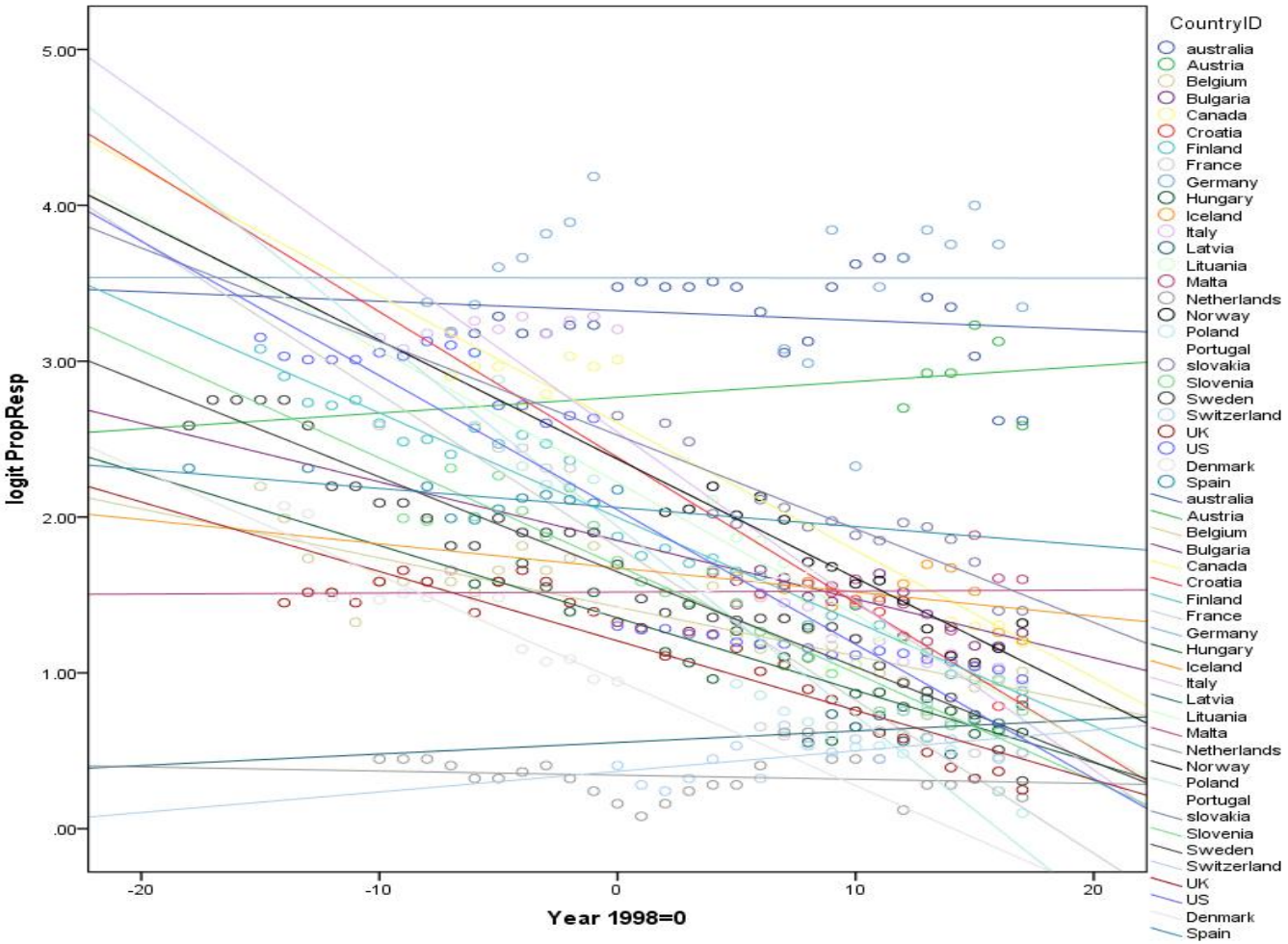
- Nonresponse increase and changes in nonresponse nature and characteristics
- Increased costs traditional methods
  - Combined with cuts in research budgets
- Increase in International Surveys
  - Different survey traditions in different countries
  - Different coverage patterns
- Increase in Online Surveys and desire to exploit new technologies and devices
  - Coverage Problems

Internet Coverage..

- Internet coverage increasing over years
  - Countries differ in internet penetration
    - International comparative surveys
      - Different modes or mode mixes in different countries
- But, even with high coverage
  - Digital divide between subpopulations
    - Differences in age, education, gender…
      - Couper, 2008
    - Declining over time, but bias still exists
      - Mohorko et al, 2013 Sterret et al, 2017
- Solution: *Concurrent* mixed mode survey
  - Different modes for different parts of population
    - E.g., online and mail. Example German GESIS-panel

Example 2: Nonresponse

- Nonresponse is increasing over countries and time



Combined Data: LFS Luiten et al (2017) & De Leeuw & de Heer (2002)

Note: de Leeuw & de Heer negative year codes (1998=0)

Need for Mixed Mode Non-Response

- Nonresponse is increasing over countries and time
- Consequences:
  - Smaller realized samples (smaller N!) and **higher costs** per completed
  - Respondents and nonrespondents may differ on key variables: **nonresponse bias**
- Solution: Sequential mixed-mode approach
  - Different modes in sequence, most affordable first
    - American Community Survey
      - Online, mail, telephone (CATI), face-to-face (CAPI)
    - Statistics Netherland Mixed-Mode test-phase
      - Online, CATI, CAPI
    - UK Understanding Society Innovation panel experiment
      - CAWI, CAPI (earlier CATI, CAPI)

MM and Representativity

- Few empirical comparative studies:
  - Kappelhof (2015): Study of immigrants in Holland
    - Socio-demographic different respondents participate in different modes
    - But, single mode CAPI best reflection of immigrants
  - Klausch et al (2016): General population Holland
    - For socio-demographics the F2F follow up increased overall R-indicators of mail and telephone single-mode response.
    - Representativeness of single-mode web was already optimal
  - Bandilla et al (2014): Reapproach ALLBUS Germany
    - Web + mail better representation, demographics and general attitudes
  - Messer & Dillman (2011); Dillman (2017): General population Several States, USA
    - Web-Only excludes important segments of population.
    - Web plus mail better representation

Meta Analysis

- Nonexperimental study on Representativity
  - Meta-analysis (Cornesse & Bosjnak 2018, SRM)
    - 45 mixed mode surveys and 51 single mode surveys, all using R-indicators
  - Significant higher R-indicators for mixed mode (.04 average difference) indicating higher representativity in mixed mode surveys
  - Benchmarks and Median Absolute Bias (MAB) too few studies
    - Only 8 mixed-mode (vs 101 single mode) using MAB

Sequential vs Concurrent

- Evidence sequential mixed-mode is best:
  - Offering a choice may lower response rates
- Fulton & Medway (2012). Meta-analysis of 19 experimental comparisons of concurrent choice option of web i/mail vs mail only surveys
  - Choice reduces response rates (on average 3.8%).
- Use a sequential approach
  - Do not offer CHOICE
  - However, if you KNOW the preferred mode, always present people with their preferred they respond better (Olson et al, 2012).
  - Adaptive designs offer special groups special methods

Why Not Offering Choice?

- Researcher's viewpoint
  - Client centered, respondent friendly
- Respondent's viewpoint is different
  - Increased cognitive burden
    - Two decisions to make instead of one
      - From "will I participate" to "will I participate and what method do I want to use"
      - Two decisions harder task than one
      - Simplest thing is opt-out
    - More concentrate on choice, not on survey
      - Distracts from message and arguments on why to cooperate
        - Weakens saliency
  - Respondents postpone, procrastinate, and …

Concurrent 2.1

- Form of adaptive mixed-mode design
- Offer known preference
  - Known from previous survey
    - Longitudinal, panel approach, e.g. GESIS
      - GESIS online but paper mail for those who do not have Internet OR prefer paper
- Estimate propensity of mode preference / bests suited mode
  - Tailor mode to respondent
    - Early example Dutch survey of Consumer Sentiments (2013)
- Not offer choice, but ‘nudge’ respondent
  - Push to web approach (Dillman, 2017)

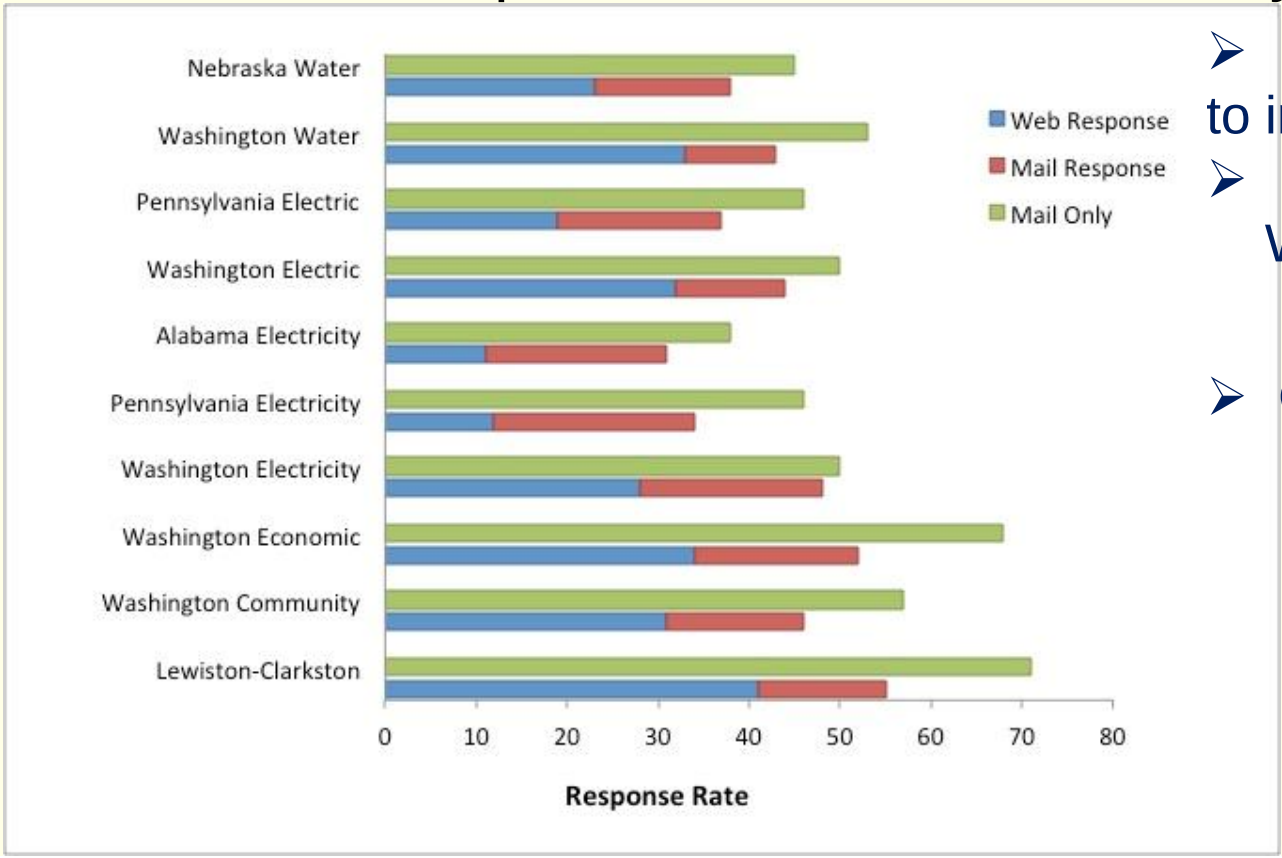
Tailoring Respondents Concurrent Mixed Mode

- Dutch Survey of Consumer Sentiments (SCS)
  - Ongoing cross-sectional CATI survey
  - Uses para-data from previous data collection
  - Uses demographics from registers
    - Logistic regression contact and cooperation response propensity (Luiten & Schouten, 2013)
  - Experiment with concurrent mixed mode next wave
    - Mail survey to those with low propensity to respond, web to those with high propensity (middle group given choice)
      - Cost considerations important, respondent burden important
    - Follow-up nonrespondents with CATI (sequential)
  - Maintain level of response (high prop: 31% low prop 35%: in reference survey 38 vs 18%)
  - Better representatively (R-indicators) on key variables SCS (sex, age, ethnicity, etc)

hiips://www.cbs.nl/NR/rdonlyres/1071A190-B552-4758-94C3-B9E29CD584DE/0/2013x11Luitenpub.pdf

Web + Mail: Push

- 10 experiments USA 2007-2014
  - Average response mail-only 53%, Mix web-mail 43%
  - Web + mail respondents similar to mail only



- Differences due to implementation
- More push to the Web
  - 60% is web
- Offering choice
  - 80% is mail

See Dillman, 2017 Dillman, Smyth & Christian, 2014, chap11

Push to the Web

- Further pushing to the web (Millar & Dillman, 2011)
- Use E-mail augmentation of postal contacts
  - Requesting a response to online survey by paper mail is burdensome
  - Prenotification by paper mail has advantages
    - Can send an incentive
    - Emphasize legitimacy
  - Combine email and postal (e-mail augmentation)
    - Postal advance letter (prenotification)
    - Supportive e-mail message following the first postal contact
      - To decrease burden and time for respondent (just click on URL)
      - Show that researchers care about respondents (show regard)
  - This results in response rate equivalent to mail-only

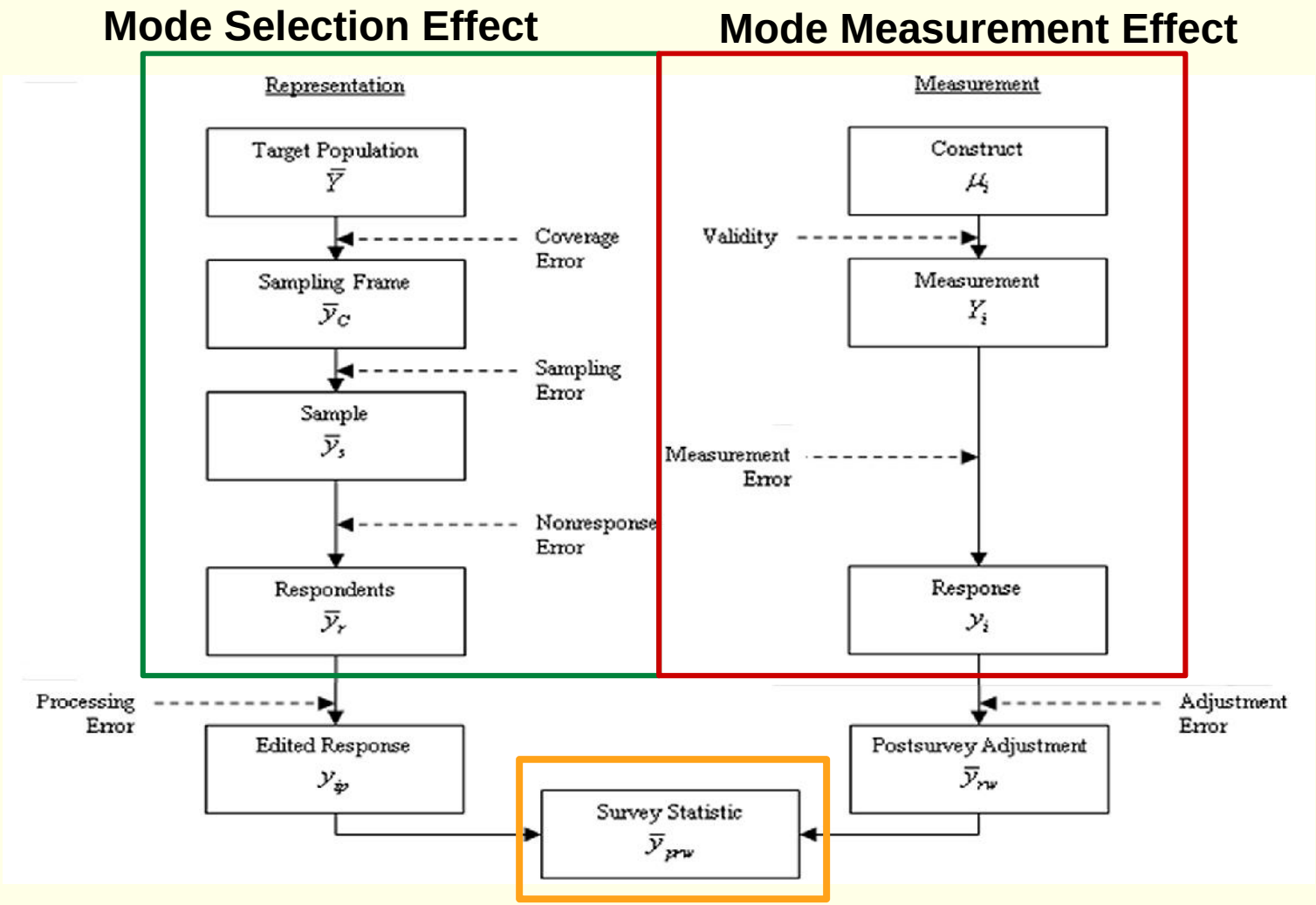
Free Lunch?

- How about better measurement?
  - It depends
- Different mode for specific questions to all
  - All respondents
    - Sensitive questions in self-administered mode for all
    - Observation, such as, GPS signal though mobile
    - Biomarkers
    - Administrative data
  - Win-Win
- Different modes for different respondents
  - Goal reduce noncoverage or nonresponse
  - Potential for differential measurement error
  - Source of worry!

About Mode Effects

- Mode effect as such does not exist (Tourangeau)
  - Mode effect has two components
    - Differential non-observation error or **mode-selection-effect**
    - Differential observation error or **mode-measurement-effect**
    - Mode effect is net effect of non-observation and measurement error differences by mode
- Using two or more modes within one survey for one population (e.g., sequential mixed mode design) should increase coverage and response
  - Mode selection effect is than **wanted / desirable** as it reduces overall coverage and nonresponse error!
  - If there is no selection, different modes bring in the same respondents → use the cheapest mode for all
- Mode measurement effect cause for concern

Confounding Mode Selection and Measurement Effects



To Mix is to Design

- Mixing data collection modes has advantages in reducing noncoverage and nonresponse errors:
  - The **wanted** mode selection effects
- Mixing methods may enhance measurement errors
  - The **unwanted** mode measurement effects
    - Especially important for comparisons over groups!
- So, Design for Mixed Mode Surveys
  I. Design equivalent questionnaires!
  II. Estimate mode effects, separating wanted mode selection from unwanted mode measurement effects
    I. Need auxiliary data
  III. Adjust

Need For Auxiliary Data

- Separating mode selection and measurement effects requires additional information

1. Use available data
   - Demographic variables assumed unaffected by mode measurement effects
   - Use an existing single mode reference survey (considered equivalent)
   - Single mode data from previous measurement in longitudinal designs
     - Longitudinal data offer many opportunities
2. Design for it: collect additional data from random subsample
   - Subsample gets only a single mode, or is part of embedded randomized mode experiment
   - Subsample gets a follow-up single mode survey

Need For Auxialiary Data

-To distinguish between wanted selection and unwanted mode measurement effects
-To estimate mode measurement effects
-To adjust for mode measurement effects

Examples:

Subsample single mode ESS experiment:
Jaeckle, Roberts, Lynn (2010)

Existing reference survey: Revilla (2015)
Vannieuwenhuijze (2013)

Repeated measures: Klausch (2014)

Longitudinal data: Cernat (2015), Hox (2015)

In Sum

- Design phase
  - *Minimize* differences (in data collection)
    - Equivalent questionnaires and procedures
  - Plan collecting / finding auxiliary information
  - Decide on analysis strategy
    - E.g., is latent variable approach feasible or not
- Analysis phase
  - Estimate both the wanted mode selection effects and the unwanted mode measurement effects
    - Mode measurement effects typically differ *for different questions* in the questionnaire
  - Adjust if there are *mode measurement effects*


thank you
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