On the Utility of Paradata in Major National Surveys: Challenges and Benefits

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Presentation Overview

- A summary of research conducted examining the quality and utility of paradata in the U.S. National Survey of Family Growth (NSFG)
- Research on the utility of paradata in major panel surveys in the U.S. and Germany:
  – The Medical Expenditure Panel Survey (MEPS)
  – The Labor Market and Social Security (PASS) study

The NSFG

- The major national fertility survey in the United States
- An important source of data on sexual activity, sexual behavior, and reproductive health for policy makers
- Target population (Until Sept. 2015): Ages 15-44
- Target population (Sept. 2015-Present): Ages 15-49
- Continuous sample design: Four national quarter samples are released and worked each year
- Face-to-face interviews (60-80 minutes) with one person from each household; ACASI for sensitive items

Paradata in the NSFG

- Interviewer Observations
  - Segment (Area) Level (e.g., safety concerns?)
  - Housing Unit Level (e.g., young children present?)
  - Respondent Level (e.g., is selected R sexually active?)
  - Post-survey observations (e.g., ACASI behaviors?)
- Call Record Data
  - Number of call attempts
  - Evidence of refusals, concerns, etc.

Paradata in the NSFG

- Case Disposition Outcomes
  – Respondent, Final Refusal, Non-Sample, etc.
- Keystroke Information
  – Interviewer requests for help, backing up, etc.
  – Respondents changing answers
  – Response timing for individual survey items

The MEPS

- The U.S. Medical Expenditure Panel Survey
- Face-to-face subsample from National Health Interview Survey with five rounds over 2 years
- Paradata:
  - Call Record Data
    - Number of call attempts
    - Evidence of refusals, concerns, etc.
  - Case Disposition Outcomes
    - Respondent, Final Refusal, Non-Sample, etc.

The PASS

- The PASS ‘Labour Market and Social Security’ Study, in Germany
- An annual mixed-mode household survey based on two random samples (welfare benefit recipients and households from a residential building survey); now in 10th panel wave
- Paradata:
  - Call Record Data
  - Case Disposition Outcomes
  - Interviewer Observations (experimental study)

Utility #1: Nonresponse Adjustment

- Interviewer observations collected on all sampled units are included in models of response propensity, which are used to adjust weights
- Observations related to both key outcomes and response propensity have the ability to reduce nonresponse bias

NSFG (West, 2013a)
Current sexual activity of selected R
Presence of young children
Physical impediments to housing units

PASS (West et al., 2014)
Income Bracket (low, med., high)
Anyone in HH on welfare benefits

Challenge #1: Observation Quality

- What if the observations are prone to error?
- They are (West, 2013a; West et al., 2014):
  - Sexual activity: 78% “accuracy”
  - Young children: 72% “accuracy”
  - Benefit receipt: 78% accuracy
  - Income Bracket: 55% accuracy
  - Accuracy also varies substantially among interviewers (West and Kreuter, 2013; Sinibaldi et al., 2013; West et al., 2014); **Why?**
- Error-prone observations will hinder the effectiveness of nonresponse adjustments (West, 2013a; West, 2013b)

Challenge #1: Observation Quality

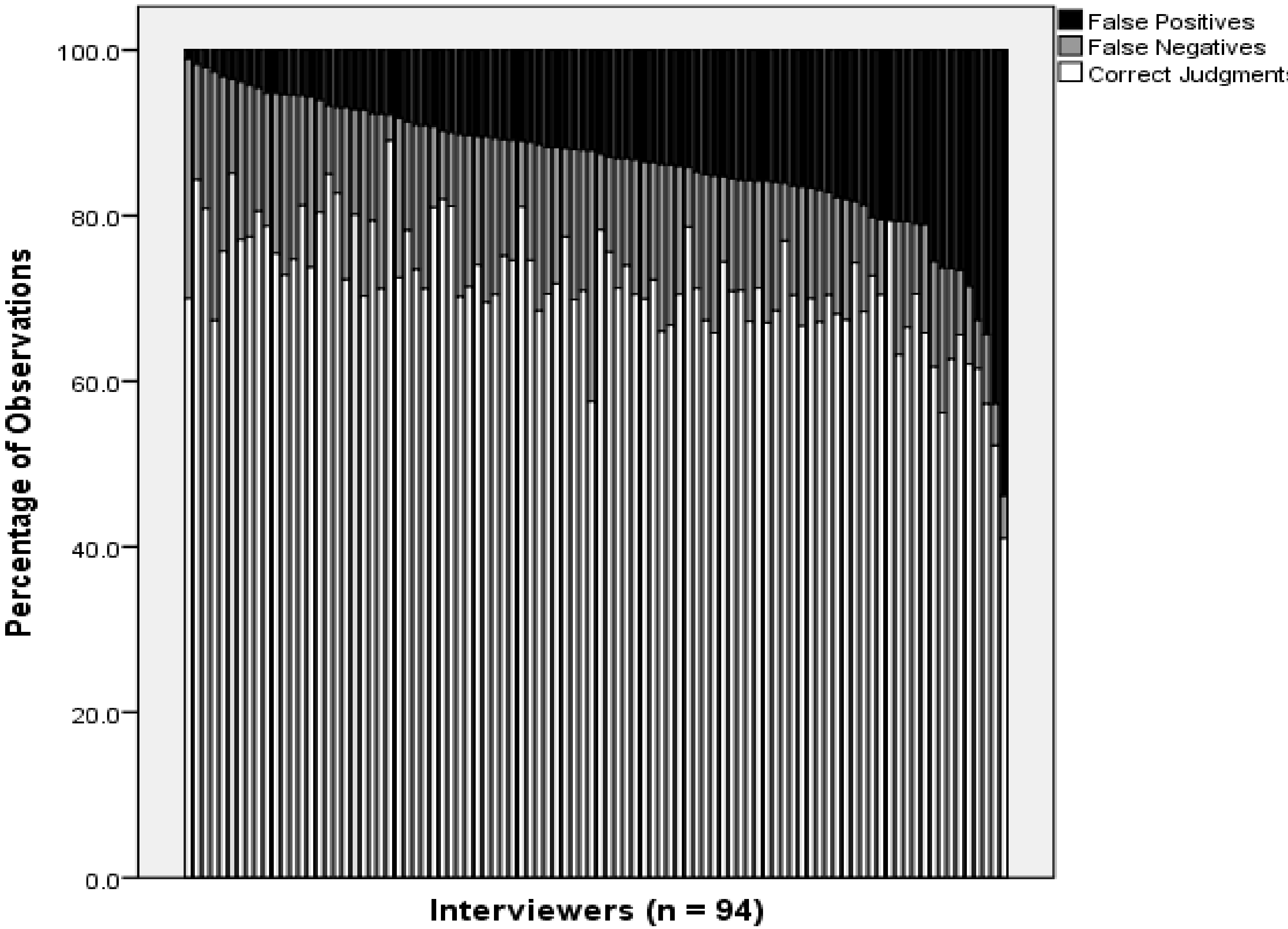


Figure 1: Variance in Observation Accuracy Among 94 NSFG Interviewers.

Challenge #1: Observation Quality

UB: Interviewer Observed		Unemployment benefit: Self-reported On UB n=1866	Not on UB n=1347
On UB	(n=1906)	72.8%	27.2%
Not on UB	(n=1234)	21.9%	78.1%
Missing	(n=73)	43.8%	56.2%

Income: Interviewer Observed		Income: Self-reported Low n=1961	Medium n=684	High n=568
Low	(n=1511)	82.3%	13.7%	4.0%
Medium	(n=1362)	45.2%	29.2%	25.6%
High	(n=267)	19.1%	24.7%	56.2%
Missing	(n=73)	69.9%	17.8%	12.3%

Challenge #1: Observation Quality

- **So what can we do about this?**
- **One idea:** Provide the interviewers with important predictors of the features they are trying to observe (West and Kreuter, 2015)
- Understand the cues and strategies that different interviewers are using to make their observations, and <u>**standardize training**</u> based on the most effective strategies (West and Kreuter, 2011; West et al., submitted)

Utility #2: Interviewer Evaluation

- The different types of paradata collected inform eligibility, contact (daily), and cooperation (daily) propensity models (Krueger and West, 2014)
- These models are used to compute expectations of _________ propensity at a given point in time
- Interviewer performance can then be evaluated by comparing actual daily outcomes to expectations, and averaging the deviations for a given interviewer (West and Groves, 2013)

Utility #2: Interviewer Evaluation

- Use keystroke information to identify interviewers with unusual tendencies to correct responses or move too quickly
- Intervene with the interviewers in question to improve performance during actual interviews

Utility #2: Interviewer Evaluation

- Factor 1: Too Fast (Z-score based on all items)
- Factor 2: Many Error Checks
- Factor 3: Many ‘Don’t Know’ and ‘Refused’

Average of Zscore	Column Labels						
	C8						
	Y2						
	Q01			Q02			
Row Labels	W08	W10	W12	W06	W08	W10	W12
IWER 3							
factor1	-0.36	-0.52	-0.54	-0.79	-0.83	-0.74	-0.82
factor2	3.48	3.41	3.25	-0.83	-0.36	0.26	0.16
factor3	0.53	0.74	1.47	0.08	0.50	1.20	1.44

Challenge #2: Model Specification

- How do we know if a given type of propensity model has been correctly specified?
- Error-prone interviewer observations can once again play a role…
- Should random interviewer effects be included in the models (so that they are evaluated against themselves)?
- What if paradata are missing?

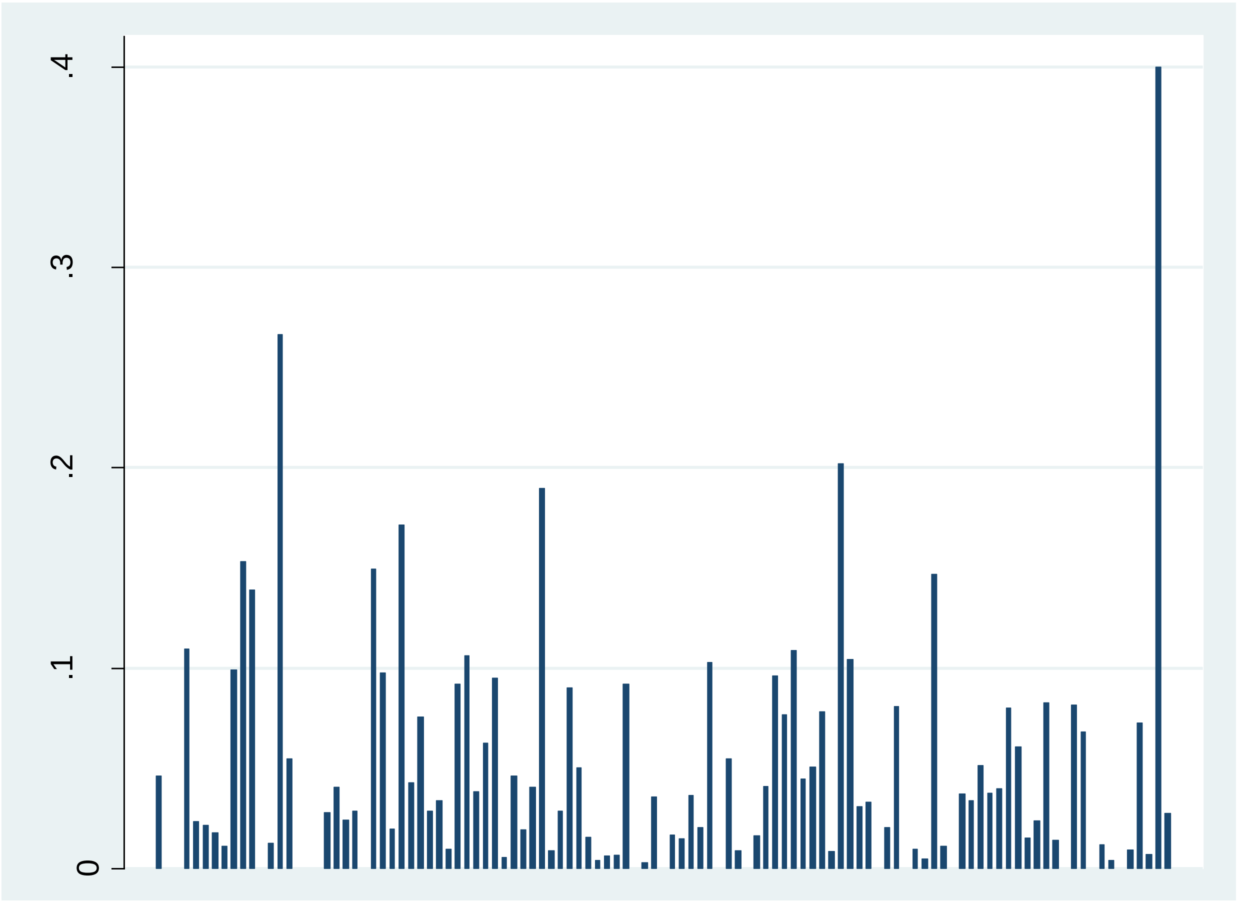
Utility #3: Response Quality

- Use post-survey observations to identify respondents who may be providing data of poor quality
- Assess interviewer behaviors that may affect responses on sensitive items during ACASI (West and Peytcheva, 2014)

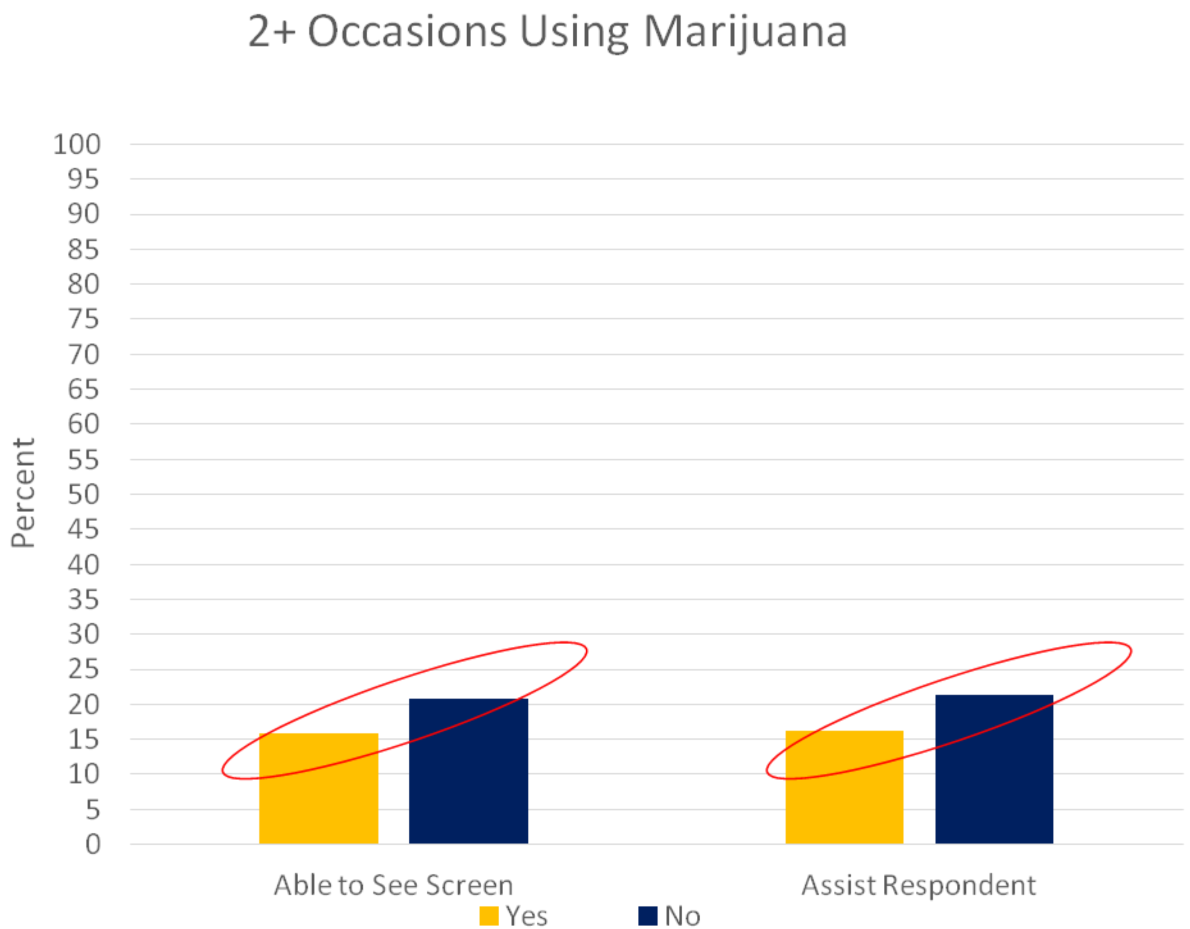
Utility #3: Response Quality

- Interviewers vary substantially in terms of how often they sit close enough to see the screen
- ACASI reports on sensitive behaviors vary as a function of whether the interviewer says that they can see the screen

Utility #3: Response Quality



Utility #3: Response Quality



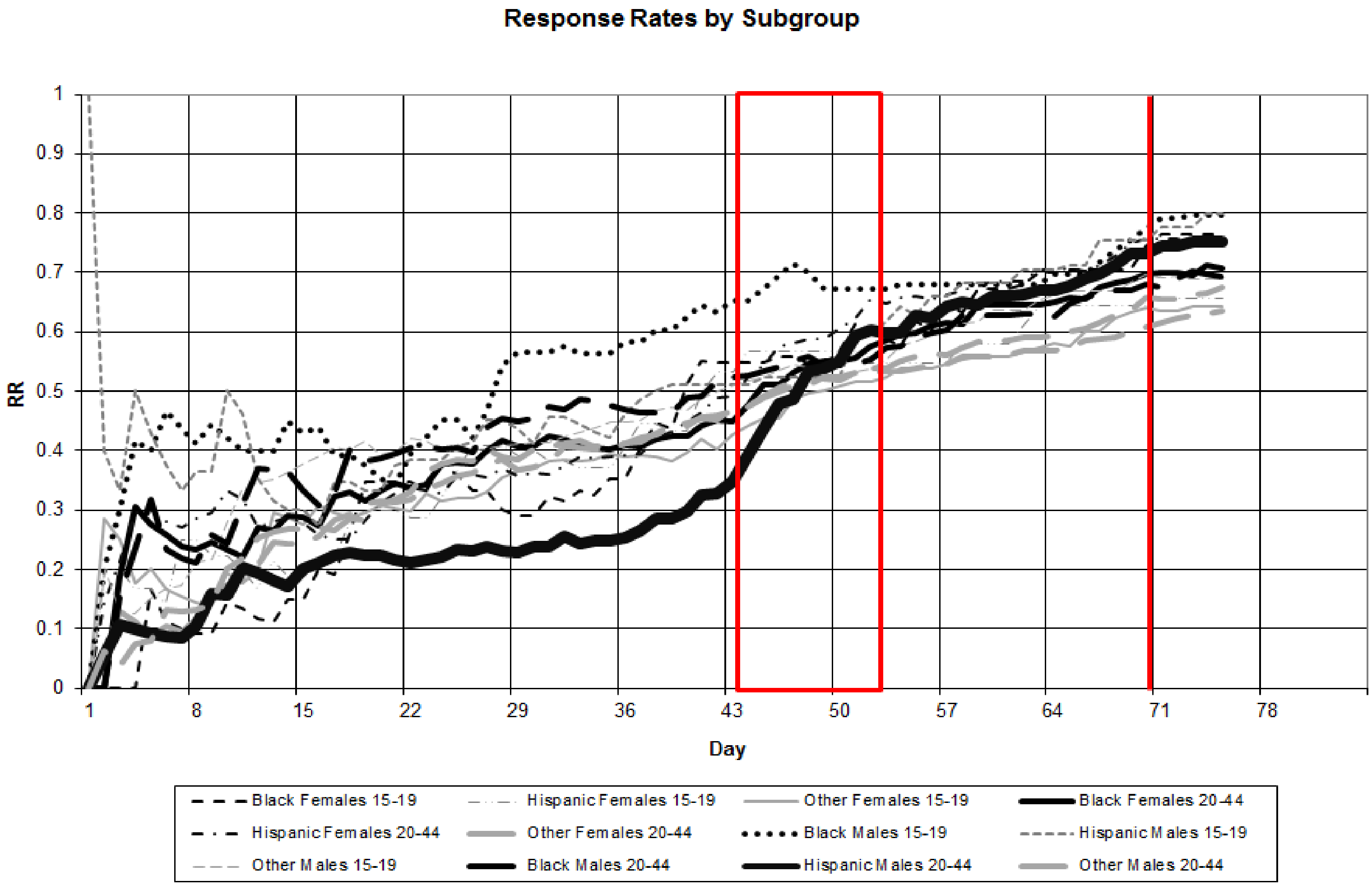
Challenge #3: Post-Survey Observations

- Are post-survey interviewer observations reliable indicators of data quality (Wang et al., 2013)?
- Past literature has shown that these are a function of respondent characteristics (rather than data quality), and there is consistent evidence of interviewer variance in them
- Can these observations be combined to reliably indicate data quality? Open question!

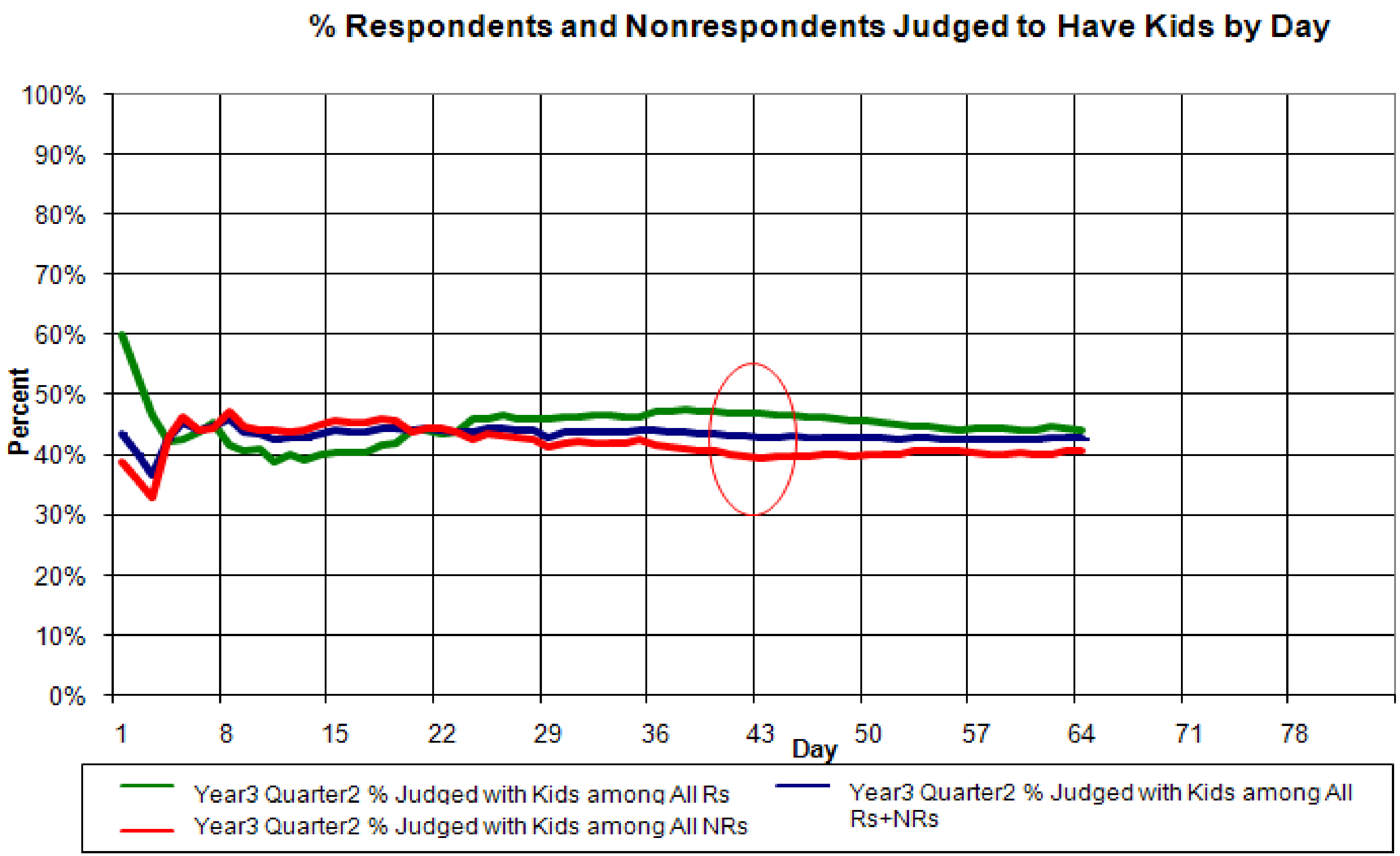
Utility #4: Responsive Survey Design

- The paradata collected in the NSFG are examined daily in an RSD framework to monitor field production and efficiency
- Interventions are implemented when the paradata suggest that certain processes may be introducing bias or inefficiency
- **Example:** Monitoring response rates across different socio-demographic subgroups, and increasing interviewer focus on subgroups found to be lagging (Wagner et al., 2012)

Utility #4: Responsive Survey Design



Utility #4: Responsive Survey Design



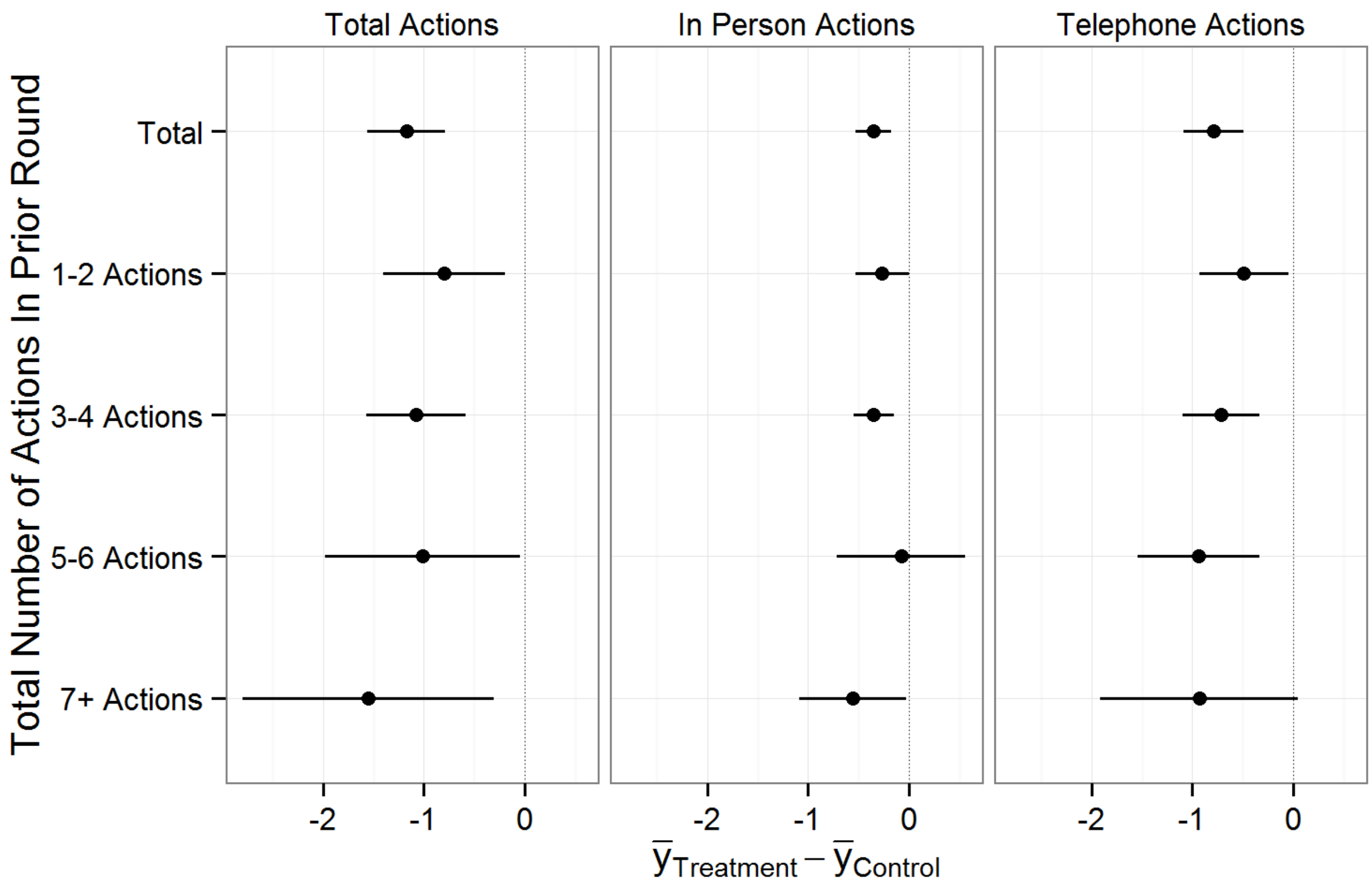
Challenge #4: Bias Indicators

- Are response rates in different socio-demographic subgroups the best indicators of nonresponse bias?
- Should we really be monitoring response rate variability among other subgroups more closely related to key outcomes (e.g., presence of children)?
  - What if the subgroup variables (e.g., observations) are error-prone?
- Paradata could inform a variety of possible nonresponse bias indicators (Nishimura et al., forthcoming; see also Krueger and West, 2014)

Utility #5: Call Efficiency

- Paradata at MEPS and PASS were used to tailor contact attempts to “best” times, based on historical data
- In the MEPS, postcards were sent out indicating a personal visit at the same time as last year (Kreuter et al., 2014).
- In PASS, successful call windows were used to reduce time to first contact and interview in subsequent waves (Kreuter and Mueller, 2015)

Utility #5: Call Efficiency



Challenge #5: Call Efficiency

- Using previous wave call information has the potential to bias towards stable respondent units → more research is needed to see if prediction of change can be integrated
- Prescribing contact strategies can be disruptive for established field procedures; buy-in of field representatives is needed
- Optimal allocation of contact times is key

Summary

- These three surveys are committed to using a variety of paradata to improve their operations and their ultimate data products
- An active program of research on paradata is necessary to fully understand (and improve) the measurement error properties of these data
- All three surveys have a long history of collaborating with other researchers interested in these areas of research!

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Thank You!

- Please do not hesitate to send any questions to bwest@umich.edu or fkreuter@umd.edu.
- We would welcome questions at this point.