

Adaptive Design Experimentation in the High School Longitudinal Study of 2009 Second Follow-up Field Test: Investigating Incentive Treatments

FCSM - December 2015

Elise Christopher

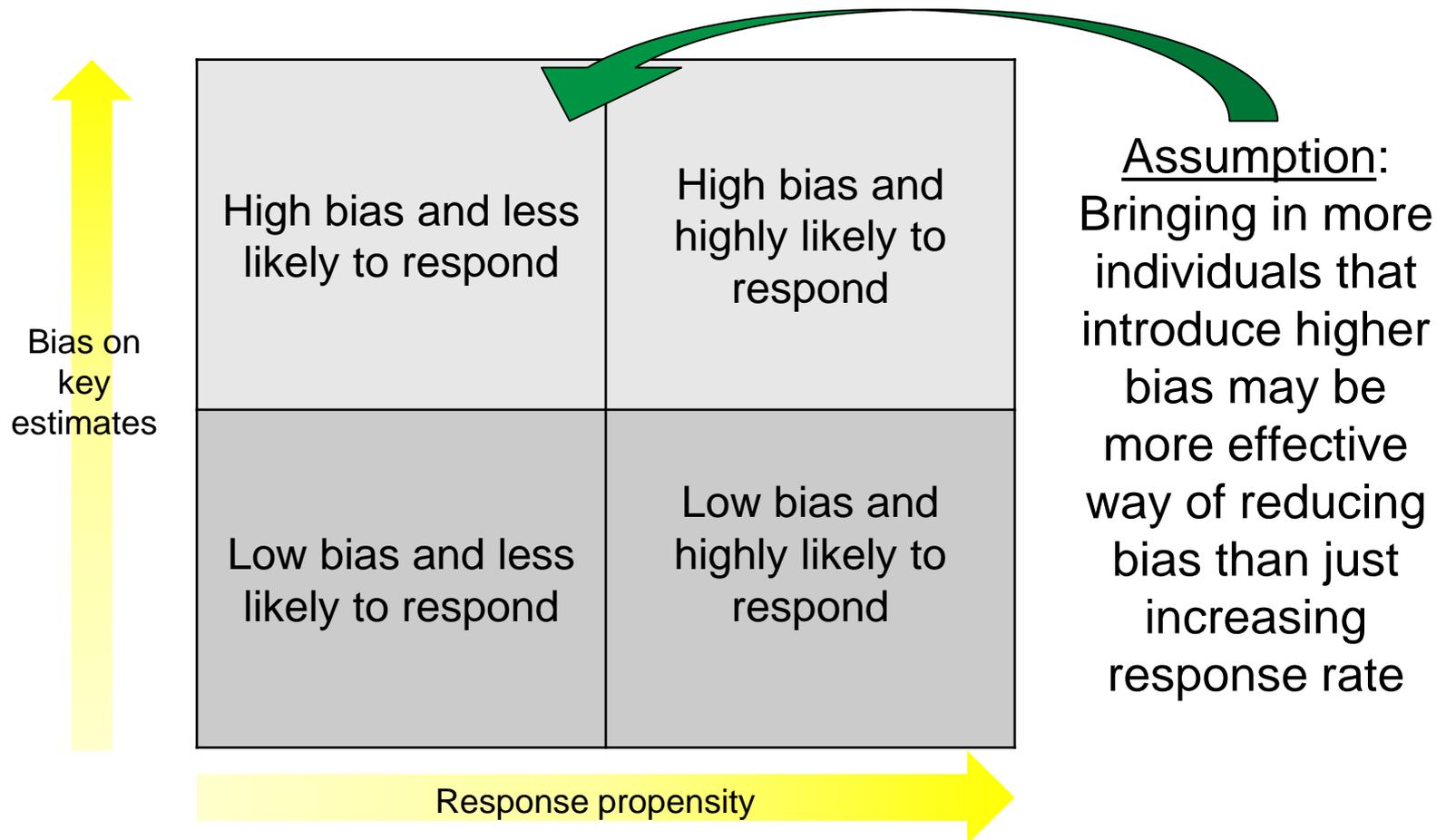
Introduction to adaptive design

- “Alteration of sampling and collection approaches during the course of a data collection using real time process and survey data to improve survey cost efficiency and to achieve more precise and less biased estimates.”
- Largely driven by declining response rates, costs for improving them, and concern about related data precision and biases
- Adaptive design experiments are numerous in the field and tend to focus on response rates

Introduction to NCES adaptive design

- This presentation highlights current research at NCES with longitudinal studies that:
 - Focuses on improving response rates
 - Using response propensity to more efficiently use resources
 - Simultaneously considers bias reduction

Targeting based on likelihood to introduce bias *and* response propensity



NCES has used adaptive design in multiple studies

- Baccalaureate and Beyond (B&B) Longitudinal Study • 2012
- Education Longitudinal Study of 2002 (ELS:2002) • 2012
- High School Longitudinal Study of 2009 (HSLS:09) • 2013
- Beginning Postsecondary Student Study (BPS) • 2014
- National Household Education Study (NHES) • 2016 (planned)

Adaptive design in HSLS:09

- Information presented here is drawn from recent work on one NCES longitudinal study
 - High School Longitudinal Study of 2009 (HSLS:09)
Second Follow-up Field Test
- Study and related adaptive design research conducted with RTI International

Previous HSLS:09 adaptive design work

- HSLS:09 follows a representative sample of 9th graders from the Fall of 2009
- The 2013 update gathered information during transition into postsecondary education or work
 - Over 23,000 students currently in HSLS:09 sample
- 2013 Update: **Bias was successfully reduced on key estimates**
 - As adaptive phases progressed, the respondent algebra 1 coursetaking rate more closely approximated known 2009 rate

HSLs:09 Second Follow-up Field Test (2015)

- 2013 Update experience tells us the bias likelihood model works
 - Individuals likely to introduce bias were targeted
- Effectiveness of the design still depends on success of treatments used to encourage response
 - Monetary and non-monetary incentives needed testing

Experiments tested treatments

- Used monetary incentives but not just about testing incentive amounts
- Effect of active treatments such as prepaying for incentives, the act of boosting incentive amounts, or monetary incentive vs. time
- Most effective treatments to be used in main study adaptive design (2016)
- Sample assigned randomly across treatment groups (N=1,100)

Experiments tested 4 treatments

- Treatments included in field test experiments:
 1. Baseline incentive offer (\$15 or no baseline incentive)
 2. Timing of prepay
 - Early prepay (sent with data collection announcement letter)
 - Late prepay (6 weeks into data collection)
 3. Incentive boost
 - \$0, \$15, or \$30
 4. Second boost (\$25) or abbreviated interview

Field test phases and treatments

Phase	Group A	Group B	Group C	Group D
Phase 1 (4/13): Web only, \$5 prepay for selected cases	No baseline incentive offer; no prepay	\$15 incentive offer; no prepay	No baseline incentive offer; \$5 prepay	\$15 incentive offer; \$5 prepay
Phase 2 (5/4): Telephone interviewing added	Telephone added	Telephone added	Telephone added	Telephone added
Phase 3 (5/26): \$5 prepay for selected cases	\$5 prepay	\$5 prepay	(Prepay at baseline)	(Prepay at baseline)
Phase 4 (6/8): Increased incentive for selected cases	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost
Phase 5 (7/6): Increased incentive or abbreviated	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview

1. Baseline incentive: B and D received \$15 offer

Phase	Group A	Group B	Group C	Group D
Phase 1 (4/13): Web only, \$5 prepay for selected cases	No baseline incentive offer; no prepay	\$15 incentive offer; no prepay	No baseline incentive offer; \$5 prepay	\$15 incentive offer; \$5 prepay
Phase 2 (5/4): Telephone interviewing added	Telephone added	Telephone added	Telephone added	Telephone added
Phase 3 (5/26): \$5 prepay for selected cases	\$5 prepay	\$5 prepay	(Prepay at baseline)	(Prepay at baseline)
Phase 4 (6/8): Increased incentive for selected cases	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost
Phase 5 (7/6): Increased incentive or abbreviated	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview

1. Baseline incentive : AC vs. BD

- Baseline incentive was significantly effective overall
 - No baseline offer (AC) vs. \$15 baseline offer (BD):
Chi-square = 6.72, $p = 0.009$

Experiment group	Final response rate
AC: No baseline offer	46.5
BD: \$15 baseline offer	54.4

2. Timing of \$5 prepay: at baseline for C and D

Phase	Group A	Group B	Group C	Group D
Phase 1 (4/13): Web only, \$5 prepay for selected cases	No baseline incentive offer; no prepay	\$15 incentive offer; no prepay	No baseline incentive offer; \$5 prepay	\$15 incentive offer; \$5 prepay
Phase 2 (5/4): Telephone interviewing added	Telephone added	Telephone added	Telephone added	Telephone added
Phase 3 (5/26): \$5 prepay for selected cases	\$5 prepay	\$5 prepay	(Prepay at baseline)	(Prepay at baseline)
Phase 4 (6/8): Increased incentive for selected cases	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost
Phase 5 (7/6): Increased incentive or abbreviated	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview

2. Timing of prepay: AB vs. CD

Experiment group	Final response rate
AB: Late prepay	48.9
CD: Early prepay	52.0

- Prepay timing had no effect

– Late prepay (AB) vs. Baseline prepay (CD)

Chi-square = 1.05, $p = 0.31$

3. Incentive boost offer

Phase	Group A	Group B	Group C	Group D
Phase 1 (4/13): Web only, \$5 prepay for selected cases	No baseline incentive offer; no prepay	\$15 incentive offer; no prepay	No baseline incentive offer; \$5 prepay	\$15 incentive offer; \$5 prepay
Phase 2 (5/4): Telephone interviewing added	Telephone added	Telephone added	Telephone added	Telephone added
Phase 3 (5/26): \$5 prepay for selected cases	\$5 prepay	\$5 prepay	(Prepay at baseline)	(Prepay at baseline)
Phase 4 (6/8): Increased incentive for selected cases	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost
Phase 5 (7/6): Increased incentive or abbreviated	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview

3. Incentive boost: comparison overall and by amount

Group	Within phase response rate
No boost	11.9
Any boost	19.5
\$15 boost	22.0
\$30 boost	17.0
No boost	11.9
\$15 boost	22.0
No boost	11.9
\$30 boost	17.0

- Incentive boost

Significant effect of boost to no boost:
Chi-square = 6.90, **p = 0.009**

No significant difference between \$15 and \$30 conditions:
Chi-square = 2.09, p = 0.15

Significant effect of \$15 boost to no boost:
Chi-square = 9.22, **p = 0.002**

Not quite significant difference between no boost and \$30 boost:
Chi-square = 2.67, p = 0.10

4. Abbreviated interview vs. second incentive boost

Phase	Group A	Group B	Group C	Group D
Phase 1 (4/13): Web only, \$5 prepay for selected cases	No baseline incentive offer; no prepay	\$15 incentive offer; no prepay	No baseline incentive offer; \$5 prepay	\$15 incentive offer; \$5 prepay
Phase 2 (5/4): Telephone interviewing added	Telephone added	Telephone added	Telephone added	Telephone added
Phase 3 (5/26): \$5 prepay for selected cases	\$5 prepay	\$5 prepay	(Prepay at baseline)	(Prepay at baseline)
Phase 4 (6/8): Increased incentive for selected cases	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost	\$0 or \$15 or \$30 boost
Phase 5 (7/6): Increased incentive or abbreviated	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview	\$25 boost or abbreviated interview

4. Abbreviated interview vs. second incentive boost offer

Group	Within phase response rate
Abbreviated	10.4
\$25 boost	17.9

- Abbreviated or \$25 boost
 - Significant effect of \$25 boost over abbreviated
Chi-square = 7.37, $p = 0.007$

Summary of Experiment Results

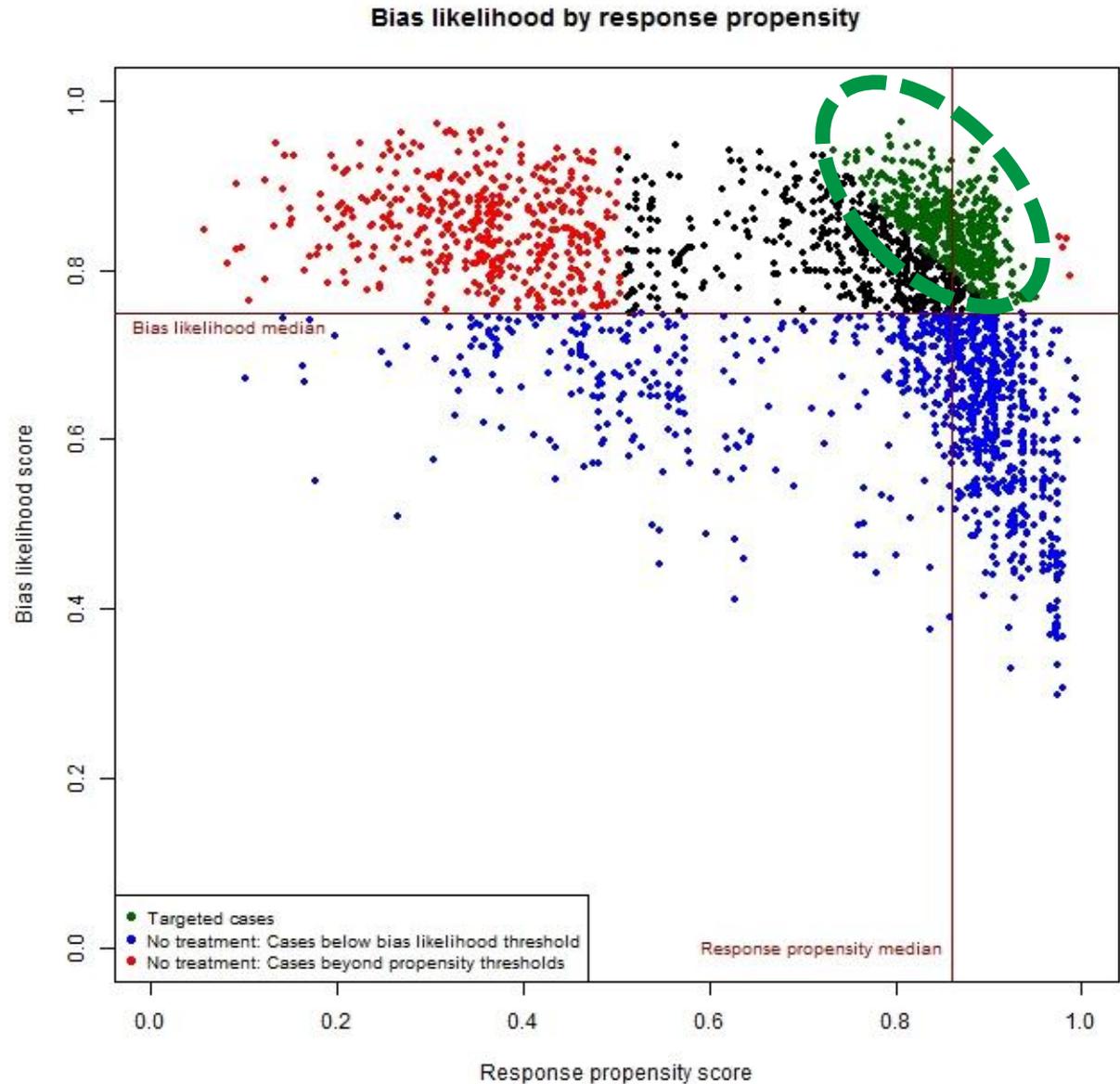
1. Baseline incentive was significantly effective
2. Prepay timing had no effect
3. Incentive boost was significantly effective, though no difference between \$15 and \$30 levels
 - More testing on best amounts is recommended
4. Final incentive boost more effective than abbreviated interview

Plans for 2016 Main Study

- Start with baseline incentive for targeted cases
- Use up to 2 incentive boosts for targeted cases
- Target sample members using bias likelihood model, adding measures of response propensity to effectively use resources
 - Not targeting cases of highest response propensity

Example*: Plot of bias likelihood by response propensity score

HSLs F2 would target cases in green area



*Example distribution from BPS:12/14

Questions?

- For additional information, please contact
 - Elise Christopher (Project Officer of HSLS:09) – elise.christopher@ed.gov
 - <http://nces.ed.gov/surveys/hsls09>
- Studies discussed here were done in close cooperation with experts at RTI International
 - Thanks to Dan Pratt, David Wilson, Jeffrey Rosen



Thank you!