



# Using Reverse Coded and Fictitious Issues Questions for Measurement Error Estimation

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# Outline

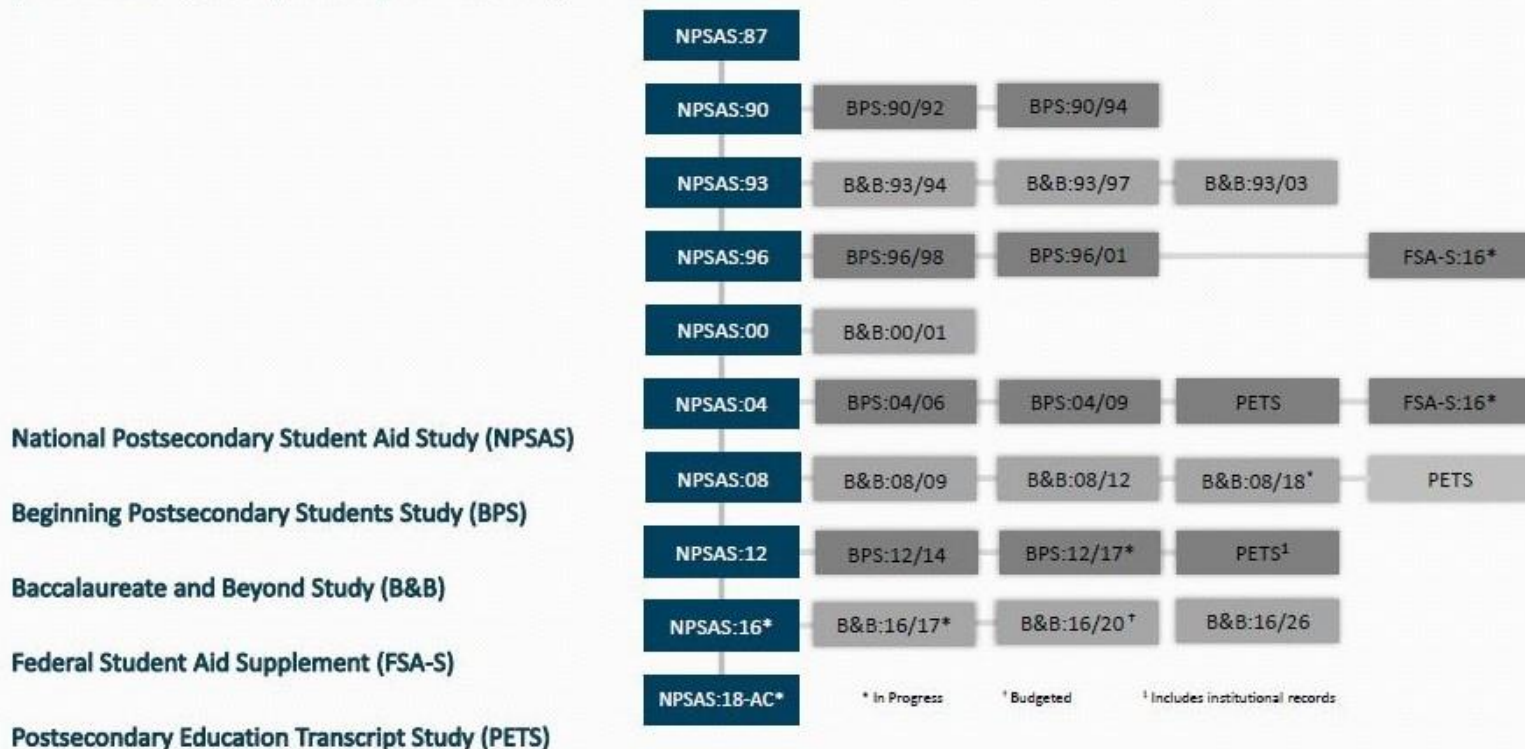
- Experimental design that motivated the investigation of ME
- Embedded indicators for ME and expectations
- Results
- Conclusions

# Data

- Field Test for the 2015-16 National Postsecondary Student Aid Study (NPSAS:16)
- Sponsored by the U.S. Department of Education
- Focus is how students pay for post secondary education
- Stratified multi-stage design using mixed modes
  - 88% web/web mobile
  - 12% CATI
- Overall RR=62%
- 34 min average completion time; \$30 incentive
- First wave of data collection for series of follow up longitudinal studies

# NCES Studies Design

## History and timeline of NCES postsecondary sample surveys



# Methods

- Experimental modular design
  - 3 conditions
  - Evaluate NR and ME
- Limited administrative data
  - Federal loan amounts
    - asked in both modules (can also look at early vs. late recall)

# Embedded Indicators for ME

- Rs are willing to provide responses regardless of question content (fictitious issues – Bishop et.al., 1980; 1986; Schuman & Presser, 1981)
  - Race and education have been found to be strong correlates of willingness to provide opinions on fictitious issues
- Fictitious loan item in each module with explicit DK
  - Approve/disapprove of the *AssistNow* loan program
  - Approve/disapprove of the *SponsorMeNow* loan program

# Embedded Indicators for ME Cont.

- Asking the same question twice, but making opposite statement
  - Acquiescence (iwer administrations) and response patterns (self-administrations)
  - Race and education have been found to be strong correlates
- Reverse-coded items in each module, using the same agreement scale
  - Satisfaction with studies at post-secondary institution
  - Unhappiness with studies at post-secondary institution

# Hypotheses

- Expect the modularized conditions to yield less ME
- Administrative Data
  - Expect less discrepancies in Module 2 due to more recall time
  - Expect larger differences between self-report and truth in CATI
- Fictitious Items
  - Expect higher substantive responses in Module 2 due to fatigue
  - Expect higher substantive responses in CATI
- Reverse Coded Items
  - Expect less agreement in CATI due to acquiescence



# Results – Administrative Data

- ME defined as the difference between self-report and NSLDS
- No difference between experimental conditions
- No difference in ME in early vs. late reports
- About 14% of the self-reports matched perfectly to NSLDS (ME=0)
- Model ME as a function of mode, demographics and background characteristics
  - Tobit model

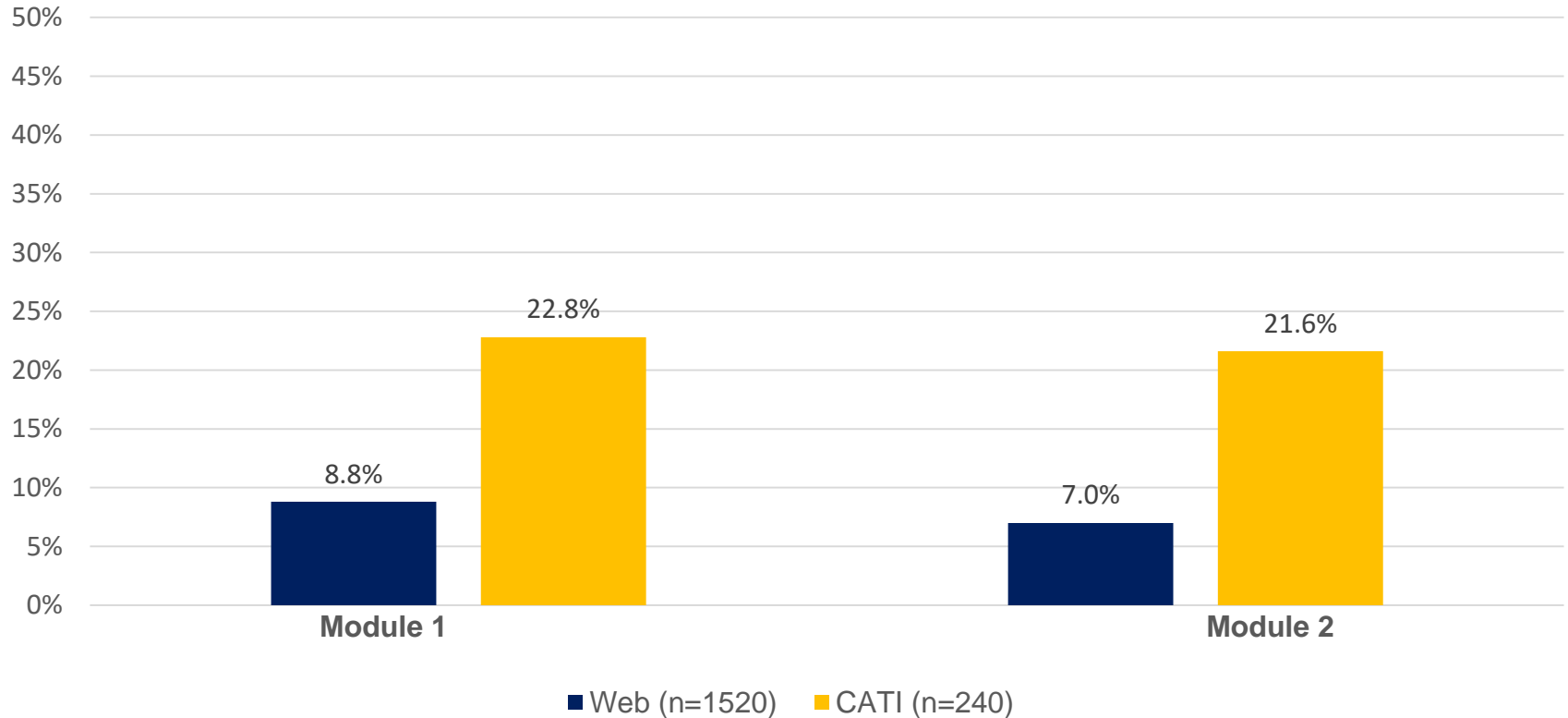
# Results – Administrative Data Cont.

Predictors	1 <sup>st</sup> response		2 <sup>nd</sup> response	
	Coefficient	SE	Coefficient	SE
Mode of admin, CATI	103	995	104	970
Federal loans 2014-15 (1000s)	160**	49	160***	48
Female	-81	715	186	697
Hispanic	1293	1277	684	1244
Black or African American	1589	1191	1688	1160
Asian	840	2210	-1038	2162
Other or More than one race	480	1462	726	1420
Parents' highest education, College, but less than bachelor's	1253	992	197	966
Parents' highest education, Bachelor's or above	1513	963	867	937
Received alternative high school credential	-249	1580	153	1539
Bachelor's degree	-33	997	-632	971
Graduate level degree	-195	1741	818	1693
Difficulty concentrating, remembering, making decisions	2,387*	1017	812	997
Age of December 31, 2014	107*	43	70	42
Constant	-1023	1702	908	1661
Sigma	8,141***	257	7,926***	250

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

# Results – Fictitious Items

Percent Providing Substantive Responses by Mode and Module



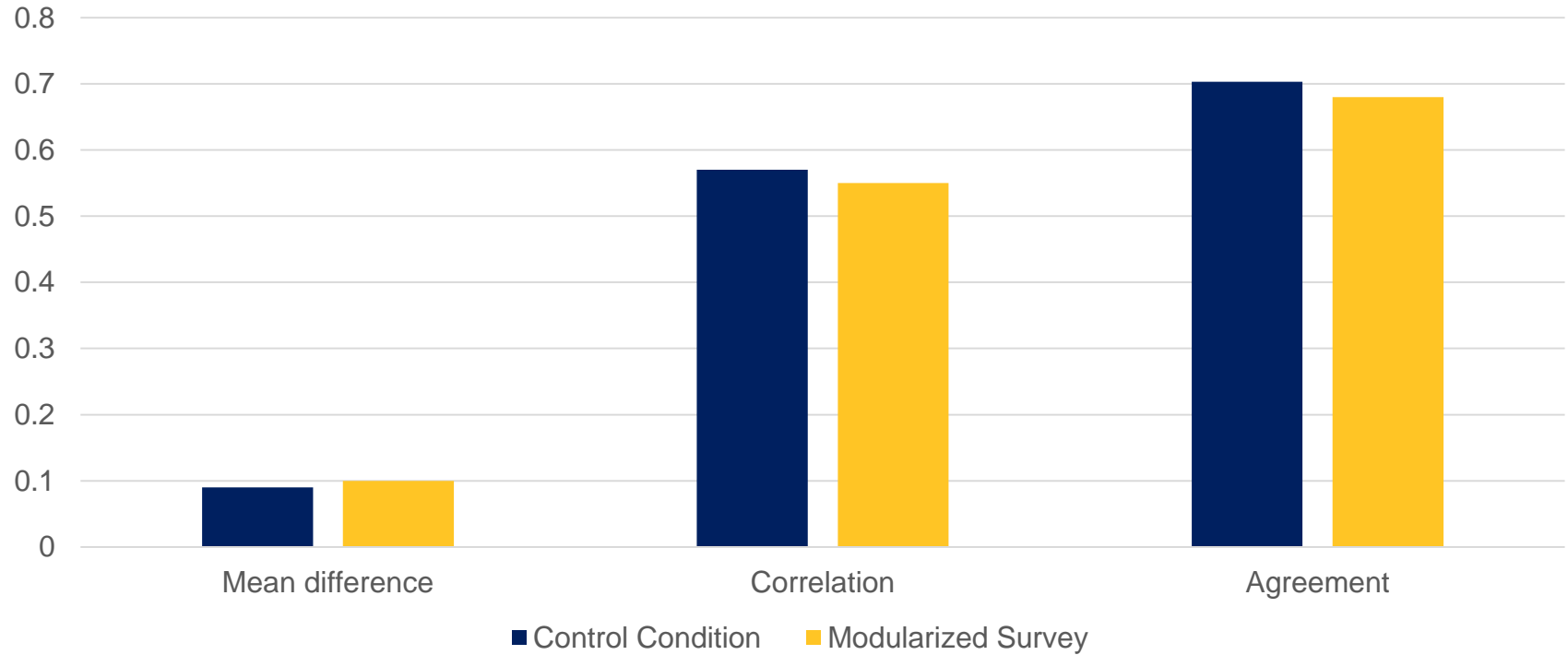
# Results – Fictitious Items Cont.

Logistic regression with DV=likelihood of providing a substantive response

Predictors	Odds ratio	95% CI
CATI	2.9***	[2.1 - 4.1]
Placement: Module 2 response	0.8*	[0.7 - 1.0]
Module experiment group	0.9	[0.7 - 1.2]
Female	0.7*	[0.5 - 1.0]
Hispanic	2.0**	[1.2 - 3.1]
Black or African American	2.3***	[1.5 - 3.6]
Asian	0.7	[0.3 - 1.9]
Other or More than one race	1.0	[0.5 - 2.0]
Bachelor's degree	0.8	[0.5 - 1.1]
Graduate level degree	0.5*	[0.3 - 1.0]
Parents' highest education - College, but less than bachelor's	1.1	[0.7 - 1.7]
Parents' highest education - Bachelor's or above	1.1	[0.7 - 1.7]
Received alternative high school credential	0.9	[0.5 - 1.6]
Difficulty concentrating, remembering, making decisions	1.4	[1.0 - 2.1]
Ever borrowed	1.2	[0.9 - 1.7]
Age on December 31, 2014	1.0	[1.0 - 1.1]
Constant	0.1***	[0.0 - 0.2]

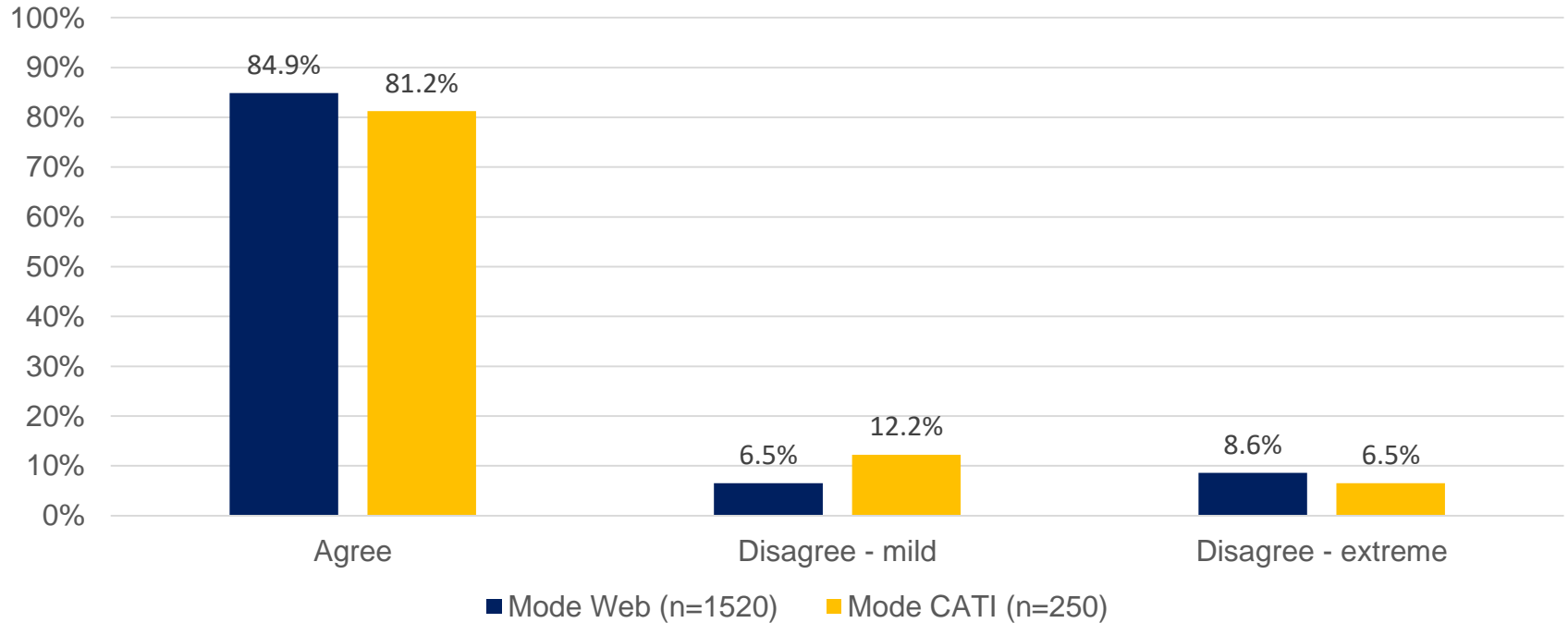
\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

# Results – Reverse Coded Items



# Results – Reverse Coded Items Cont.

Percent Agreement by Agreement Level and Mode



# Results – Reverse Coded Items Cont.

Logistic regression with DV=likelihood of providing a different response

Predictors	Odds ratio	95% CI
CATI	1.2	[0.8 - 1.8]
Placement: Module 2 response	1.1	[0.8 - 1.4]
Female	1.2	[0.9 - 1.5]
Hispanic	1.9**	[1.2 - 2.9]
Black or African American	1.6	[1.0 - 2.3]
Asian	1.5	[0.8 - 2.8]
Other or More than one race	1.6	[1.0 - 2.7]
Parents' highest education - College, but less than bachelor's	1.4	[1.0 - 2.0]
Parents' highest education - Bachelor's or above	1.0	[0.7 - 1.5]
Received alternative high school credential	1.4	[0.8 - 2.5]
Bachelor's degree	0.8	[0.6 - 1.1]
Graduate level degree	0.9	[0.5 - 1.5]
Difficulty concentrating, remembering, making decisions	1.4*	[1.0 - 2.0]
Age of December 31, 2014	1.0	[1.0 - 1.1]
Constant	0.1***	[0.1 - 0.2]

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

# Conclusions and Next Steps

- No difference in ME across experimental conditions
- Embedded indicators for ME behaved consistently with the literature
- Surprising reduction of ME later in the survey (fictitious issues)
- Each method for measuring ME was confounded with the specific item to which it was applied
  - Method selection should be based on the ME inducing mechanism(s)
- Target cases in follow up studies based on ME info
- Continue to embed such indicators in the follow up studies, but randomize
- Would Rs in longitudinal studies get annoyed by repetitious and fictitious items?



**Thank you!**

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