



# Measurement Errors in Self-Reports of Consumer Expenditures: Are Errors Attributable to Respondents or Expenditures?

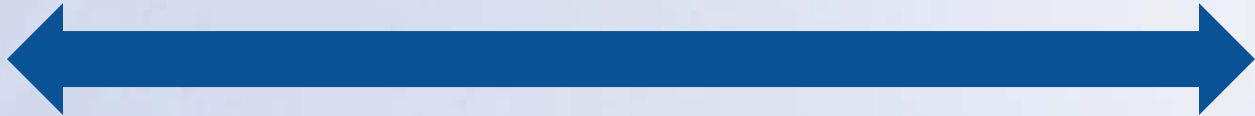
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## Correlates of Recall Error

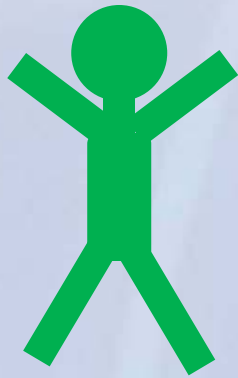
- We know a host of factors affect recall ...
  - Event (e.g., frequency, elapsed time, salience, distinctiveness)
  - Respondent (e.g., age, education, gender)
  - Survey design (e.g., mode, question wording)
- ... but what is their relative importance?

# Two Extremes of Measurement Error

All Variance  
On  
*Respondent*  
Level



All Variance  
On  
*Expenditure*  
Level



Good  
respondent

Bad  
respondent



Average  
respondent

Average  
respondent

# Research Questions

1. How much variance in measurement error is on the *expenditure versus respondent* level?
2. What respondent and expenditure characteristics are associated with measurement error?
3. How much of the variance in measurement error is accounted for by these respondent and expenditure characteristics?

# Consumer Expenditure Records Study

- Designed to investigate self-reports of U.S. Consumer Expenditure Quarterly Interview Survey
- 115 respondents completed two CAPI interviews
  - Convenience sample from two sites (DC, NC)
  - Interview 1: Self-reports of consumer expenditures
  - Interview 2: Comparison of records with self-reports
- Analytic sample:
  - 104 respondents
  - 939 expenditures
  - Mean of 9.0 expenditures per respondent (SD = 8.2), with maximum of 34 expenditures

# Measures

- Dependent variable: Measurement Error
  - Records are gold standard
  - Percent difference between record and self-report
- Independent variables

## Respondent

Gender

Age

Employment

Income

Education

Location (DC, NC)

## Expenditure

Type (housing, phone, utilities, appliance  
furniture, clothing, misc.)

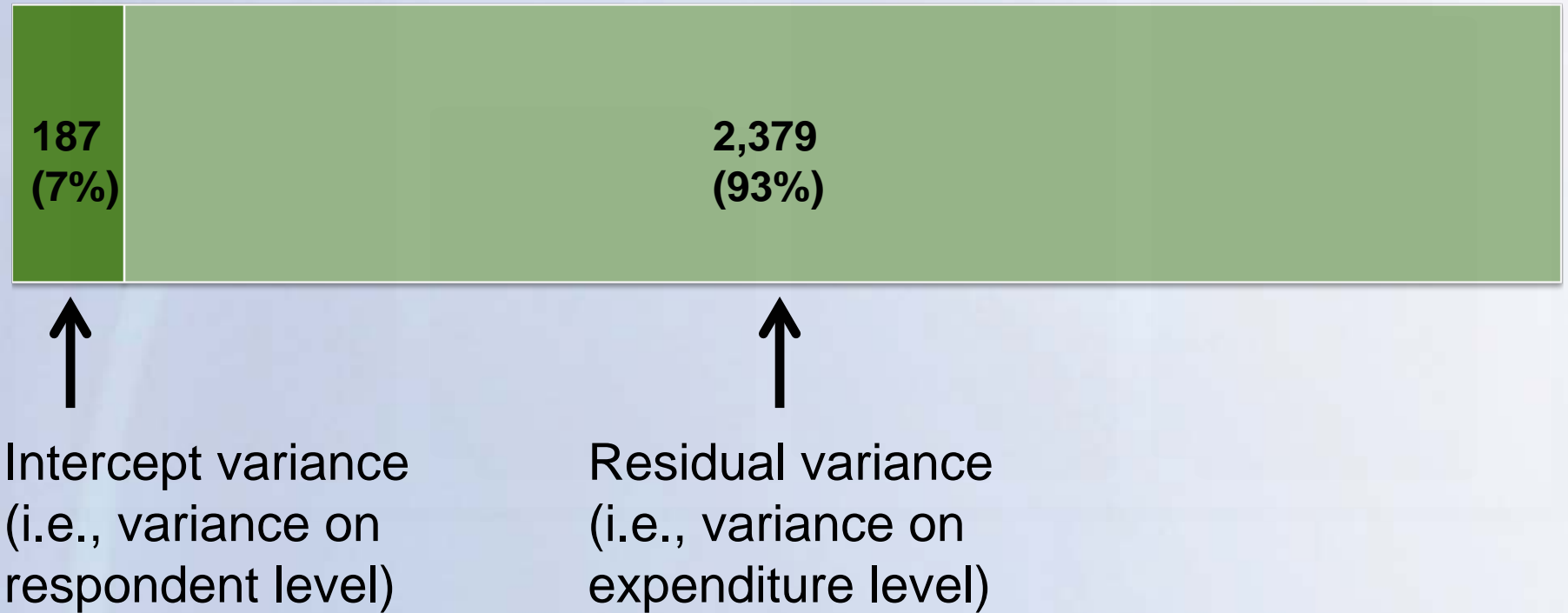
Amount

Time since expenditure

# Analytic Approach

- Multi-level models
  - Level 1: Expenditure
  - Level 2: Respondent
  
- Sequential models
  - (1) Random intercept model
  - (2) Include respondent characteristics
  - (3) Include expenditure characteristics
  
- Test for cross-level interactions

# Variance in Random Intercept Model





# Respondent Characteristics

Characteristic	$\beta$	Z
Male	4.3	1.0
Age (years)	-0.2	-1.3
<b>Employed (not employed)</b>	<b>9.5</b>	<b>2.2</b>
Low income (high)	8.5	1.4
Medium income (high)	0.8	0.2
HS or less (college)	-1.5	-0.3
Some college (college)	-1.4	-0.3
<b>DC (NC)</b>	<b>-16.0</b>	<b>-2.5</b>

Parameters are from a multi-level model predicting measurement error (percent difference between record and self-report).

Reference category is in parentheses.

Model includes random intercept and expenditure characteristics.

# Expenditure Characteristics

Characteristic	$\beta$	Z
Phone (housing)	0.1	0.0
<b>Utilities (housing)</b>	<b>20.4</b>	<b>2.4</b>
Appliance (housing)	-4.5	-0.5
<b>Furniture (housing)</b>	<b>17.6</b>	<b>1.8</b>
<b>Clothing (housing)</b>	<b>14.0</b>	<b>1.7</b>
Misc. (housing)	3.4	0.4
Amount (dollars)	-.0038	-0.7
2 months ago (current/last)	-5.0	-1.2
3 months ago (current/last)	-2.3	-0.5

Parameters are from a multi-level model predicting measurement error (percent difference between record and self-report).

Reference category is in parentheses.

Model includes random intercept and respondent characteristics.

## Limitations

- Small-scale study based on convenience sample
- Unknown whether results apply to topics other than expenditures
- We explained little variance on expenditure level (4%)

# Summary

- Key Findings
  - 93% of variance is on expenditure level: we are close to the extreme of all variance due to expenditures
  - Greater measurement error among employed & NC respondents
  - Utilities, furniture, clothing had greater measurement error
  
- Implications
  - Academics: research on expenditure characteristics
  - Survey practitioners: administrative records, question design

## More Information

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*The findings and conclusions in this presentation are those of the authors and do not necessarily reflect official views of the U.S. Bureau of Labor Statistics.*