Comparing Outbound vs. Inbound Census-balanced Web Panel Samples

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Definitions

Outbound Balancing

- Quota Targets applied when sending out email invitations

- Respondents not screened out even if sample exceeds quota cells

- Completed sample is then further adjusted with post-stratification weights

Inbound Balancing

- Quota Targets applied when respondents start survey

- Respondents screened out when sample exceeds quota cells

- No/minimal weighting needed

Definitions

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Current Study

Outbound Balancing

- Quota Targets applied when sending out email invitations:
  - Age 18+
  - Gender
  - Race/Ethnicity
  - Household Income

- n-size: 520 U.S. consumers

- Fielded November 2012

Inbound Balancing

- Quota Targets applied when respondents start survey:
  - Age 18+
  - Gender
  - Race/Ethnicity
  - Household Income

- n-size: 517 U.S. consumers
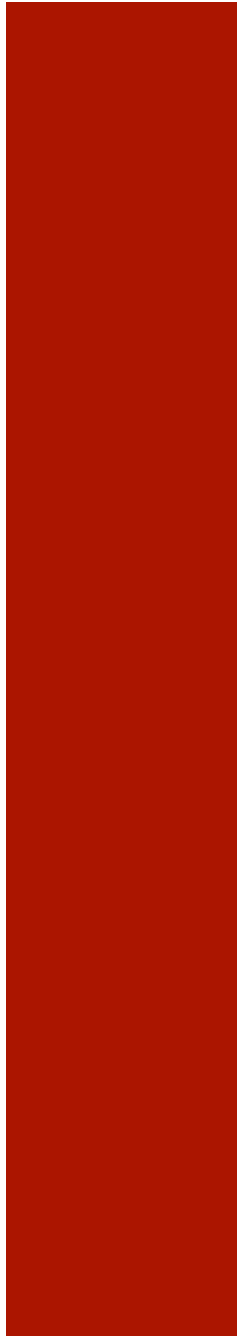
- Fielded November 2012

Overview

- Sample evaluation prior to weighting

- Weighted estimates vs. benchmarks

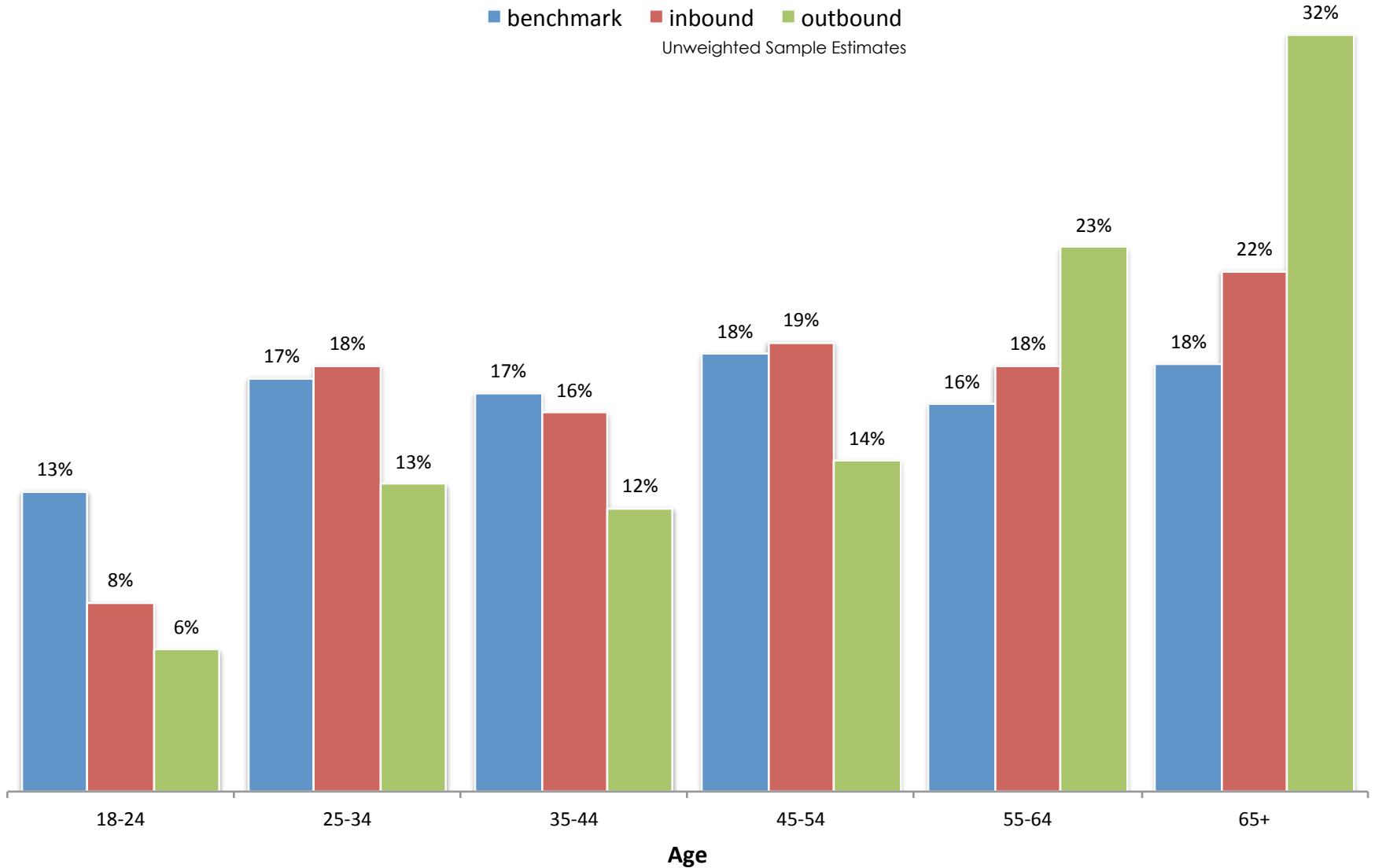- Concurrent validity

- Comparisons on profile variables
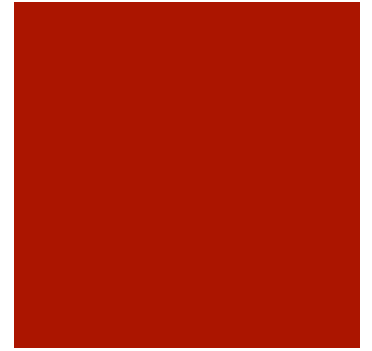
Sample Evaluation

Comparing unweighted samples to demographic parameters

Inbound-balanced sample exhibited notable gaps on youngest and oldest age groups despite strict quotas

■ benchmark ■ inbound ■ outbound

Unweighted Sample Estimates

Age	benchmark	inbound	outbound
18-24	13%	8%	6%
25-34	17%	18%	13%
35-44	17%	16%	12%
45-54	18%	19%	14%
55-64	16%	18%	23%
65+	18%	22%	32%

Age

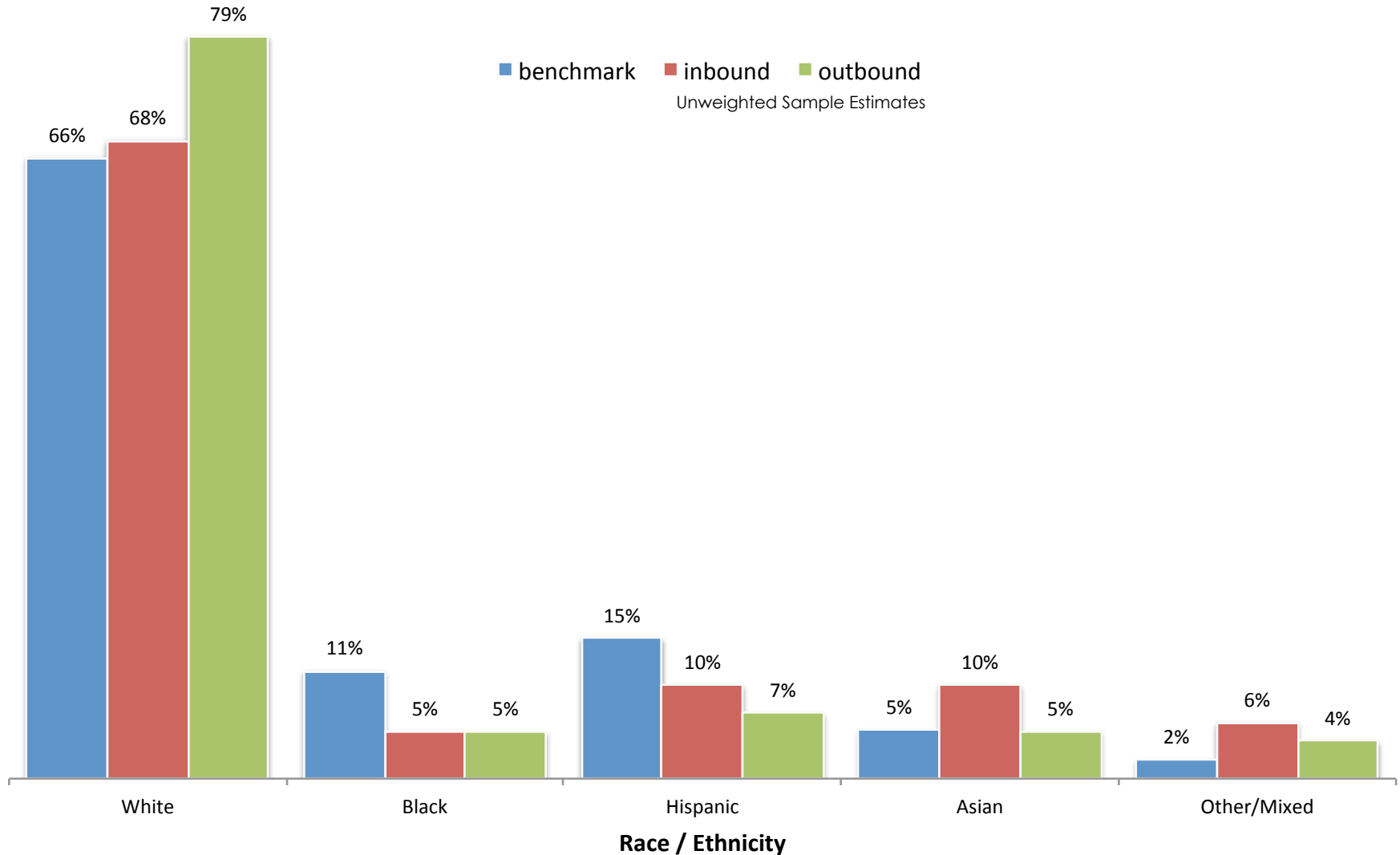Benchmark from CPS Nov 2012 - same month as survey

Both samples were reasonably close to CPS benchmarks on proportions of men and women in population

■ benchmark ■ inbound ■ outbound

Unweighted Sample Estimates

male
- 49%
- 48%
- 46%

female
- 51%
- 52%
- 54%

Gender
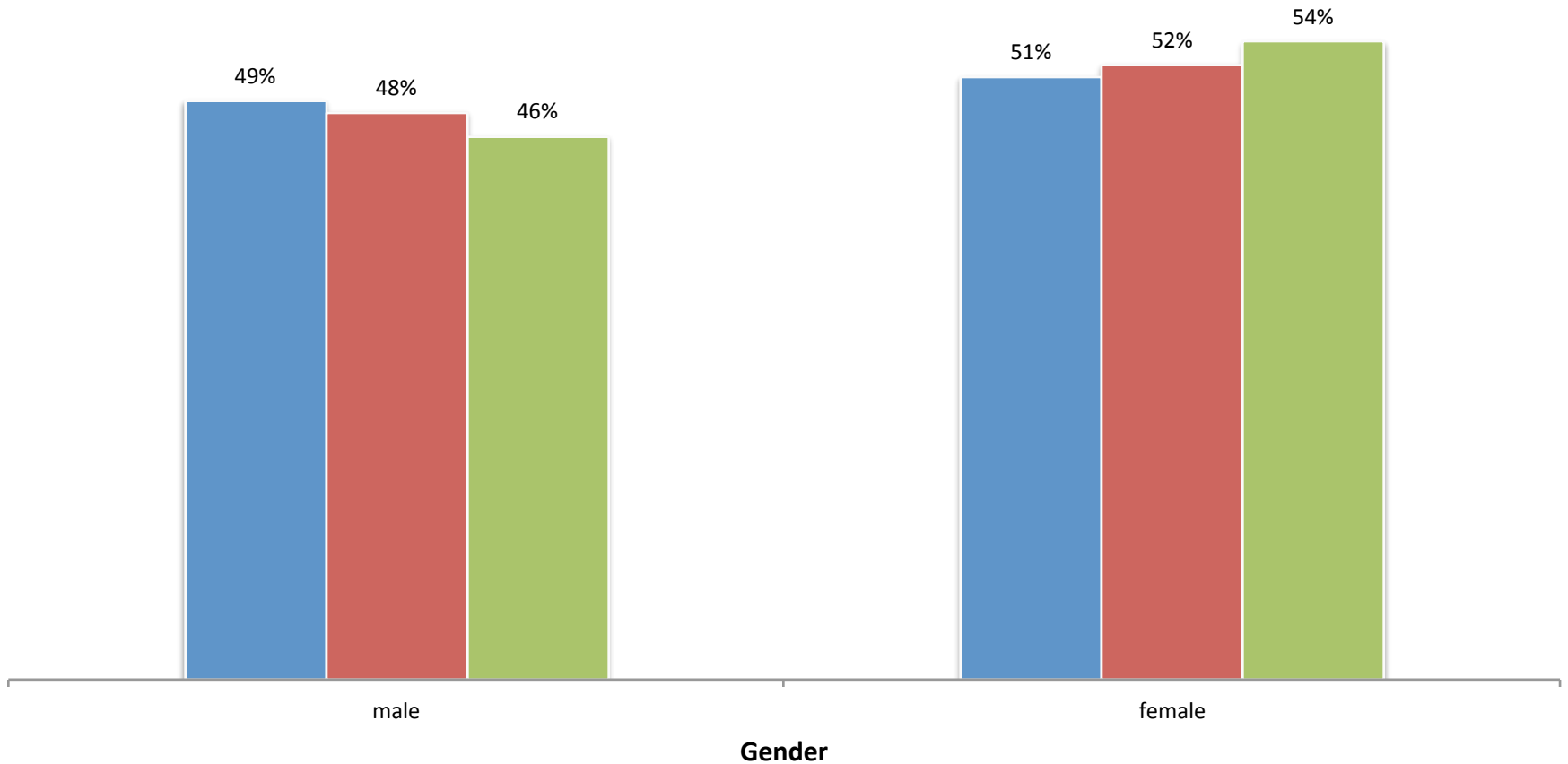
Outbound-balanced sample over-represented White respondents; both under-represented African American & Hispanic respondents

benchmark **inbound** **outbound**

Unweighted Sample Estimates

|	White	Black	Hispanic	Asian	Other/Mixed
benchmark	66%	11%	15%	5%	2%
inbound	68%	5%	10%	10%	6%
outbound	79%	5%	7%	5%	4%

Race / Ethnicity

Outbound-balanced sample tend to under-represent lower income households and over-represent higher income households

Legend: ■ benchmark ■ inbound ■ outbound
Unweighted Sample Estimates

| Household Income	benchmark	inbound	outbound
$0-14,999	13%	9%	5%
$15K-24,999	10%	8%	7%
$25K-34,999	12%	11%	8%
$35K-49,999	14%	13%	14%
$50K-74,999	19%	25%	21%
$75K-99,999	12%	15%	20%
$100K-149,999	11%	12%	16%
$150,000+	9%	8%	10%
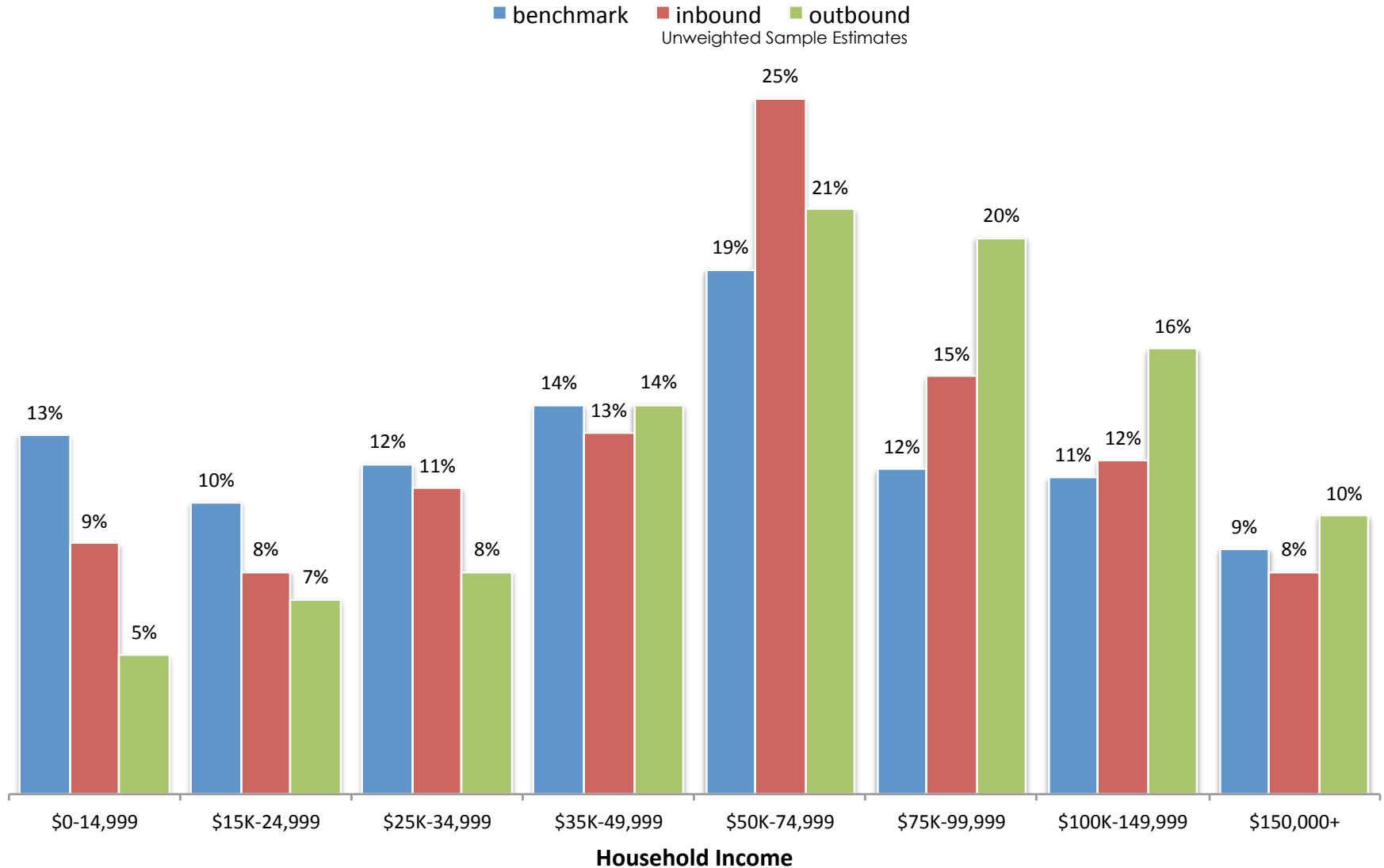
Household Income

Post-stratification Rim Weights

Iterative raking along multiple demographic dimensions: age, gender, race/ethnicity, and household income
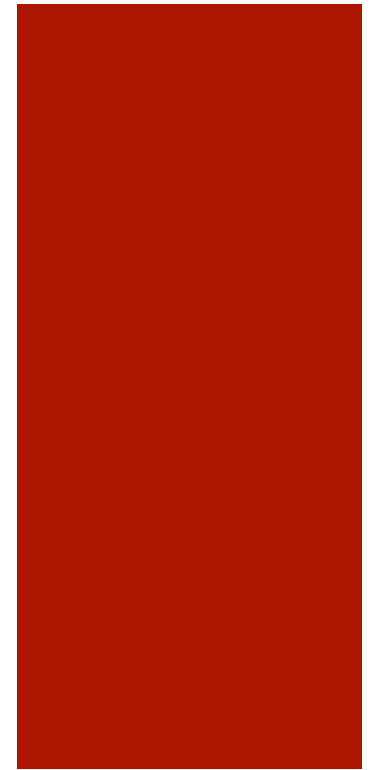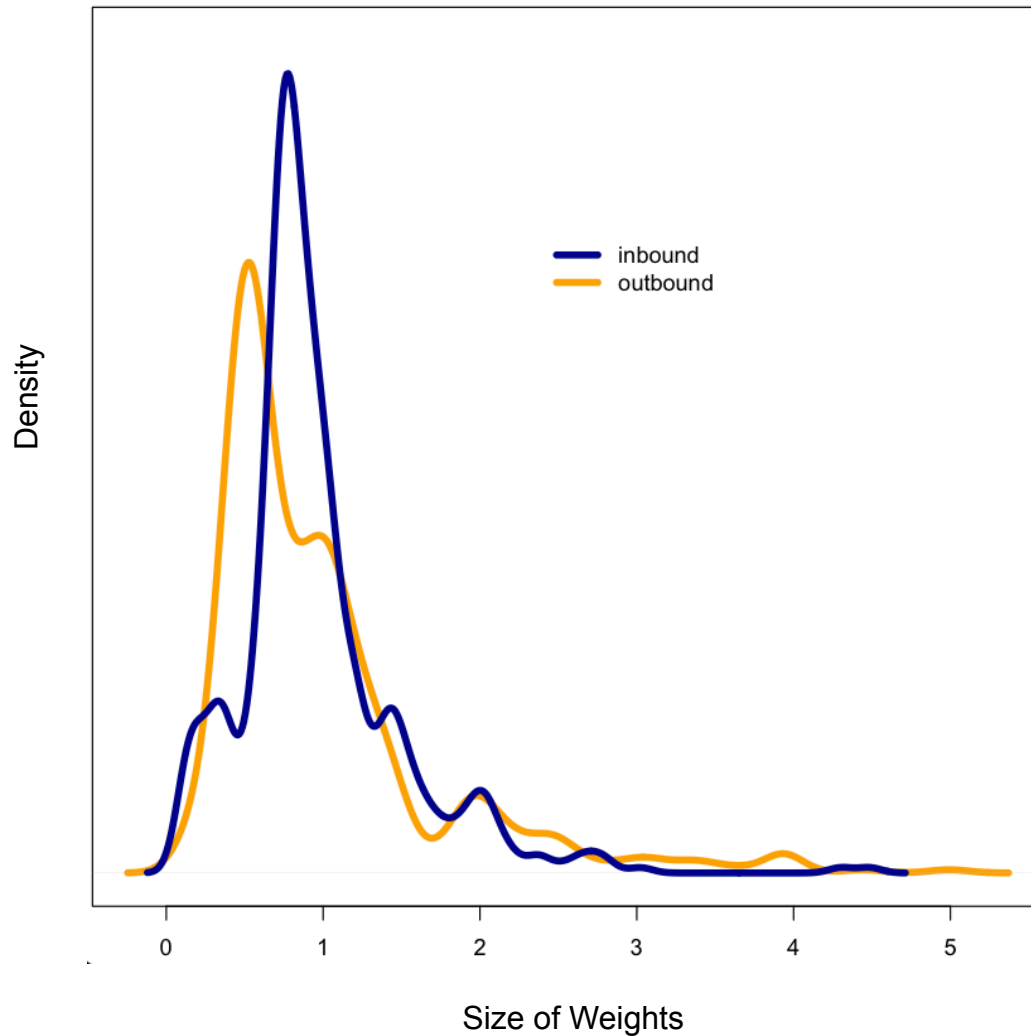
Benchmarks

Comparisons to Estimates from U.S. Census, FDIC, Pew, etc.
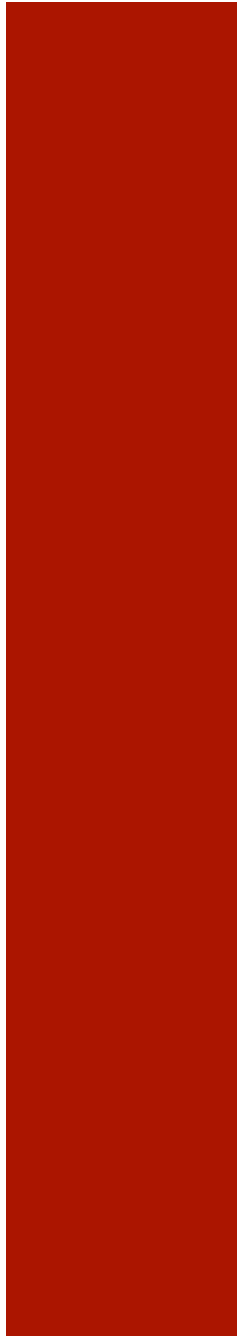
Both samples were weighted to match demographic benchmarks from U.S. Current Population Survey conducted in the same month

Avg Errors	Unweighted Inbound	Unweighted Outbound	Weighted Inbound	Weighted Outbound
Age	2%	7%	0.0%	0.0%
Gender	1%	3%	0.0%	0.0%
Household Income	2%	4%	0.0%	0.0%
Race/Ethnicity	4%	6%	0.6%	0.4%
Average Absolute Error	**2%**	**5%**	**0%**	**0%**

Before Weighting   **After Weighting**

Weights improved accuracy of estimates from <u>both</u> samples; unweighted inbound sample not as good as weighted samples

Avg Errors	Unweighted Inbound	Unweighted Outbound	Weighted Inbound	Weighted Outbound
Household size	10%	7%	3%	3%
Home Ownership	2%	12%	0%	0%
Number of Vehicles	4%	4%	4%	2%
Same residence last year	1%	3%	0%	2%
Private Health Insurance	6%	7%	6%	4%
Own Savings or Checking Account	3%	4%	0%	1%
Average Absolute Error	**4%**	**6%**	**2%**	**2%**

Before Weighting   **After Weighting**

Weighted inbound sample produced perfect match on 3 out of 6 estimates where benchmark was available

Avg Errors	Unweighted Inbound	Unweighted Outbound	Weighted Inbound	Weighted Outbound
Household size	10%	7%	3%	3%
Home Ownership	2%	12%	0%	0%
Number of Vehicles	4%	4%	4%	2%
Same residence last year	1%	3%	0%	2%
Private Health Insurance	6%	7%	6%	4%
Own Savings or Checking Account	3%	4%	0%	1%
Average Absolute Error	4%	6%	2%	2%

Before Weighting

After Weighting

Benchmarks from ACS & FDIC surveys. Values shown are average absolute % errors

Weights did NOT improve accuracy of estimates on device ownership – both samples more tech-savvy than gen pop

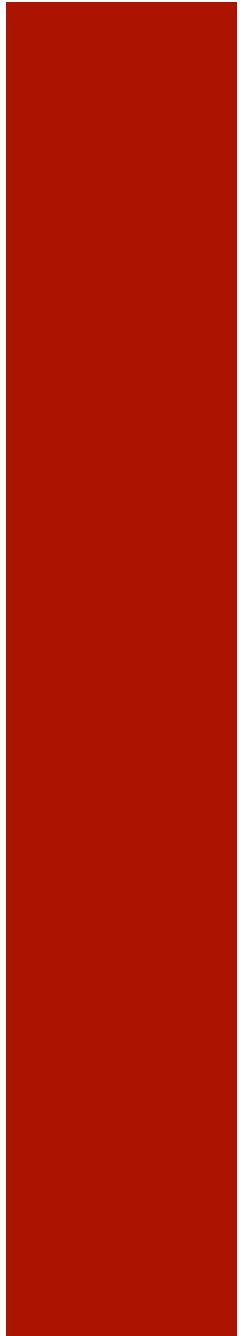| Avg Errors	Unweighted Inbound	Unweighted Outbound	Weighted Inbound	Weighted Outbound
Cellphone	7%	8%	6%	7%
Smartphone	15%	8%	17%	14%
Laptop	12%	10%	12%	12%
E-book Reader	2%	3%	0%	0%
Tablet	10%	8%	10%	6%
Average Absolute Error	**9%**	**7%**	**9%**	**8%**

Before Weighting | After Weighting

Concurrent Validity

Strength of Relationship between Correlates

Technology Adoption

- DV = self-perceived propensity to adopt new technology, coded as:

  1.00 = first to try new technology

  0.67 = wait for friends to try before trying

  0.33 = try after almost everyone else is using

  0.00 = never try

- IV = device ownership, coded as:

  1 = own

  0 = do not own

Model from outbound sample (R^2=0.181) exhibited higher concurrent validity vs. model from inbound sample (R^2=0.137)
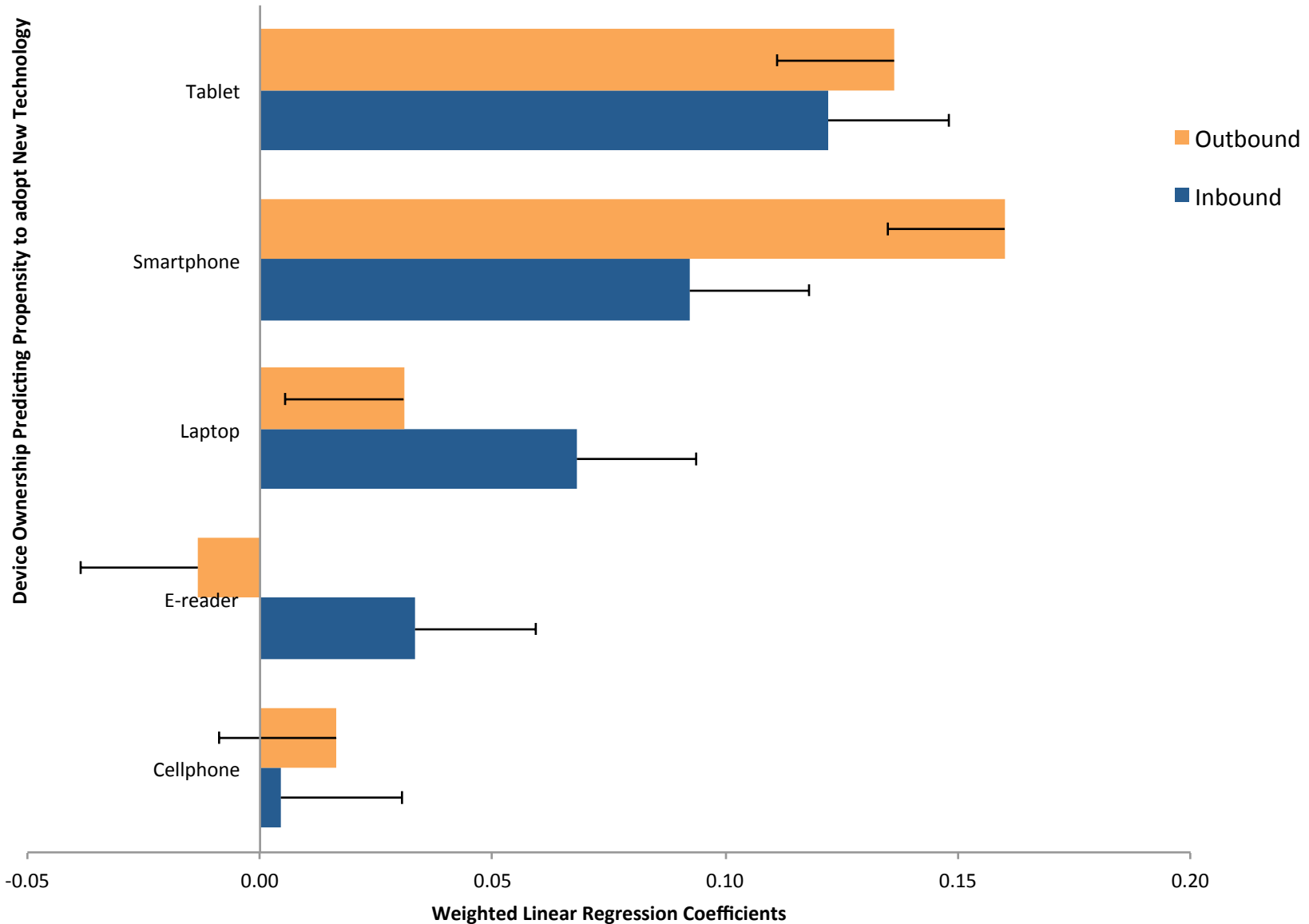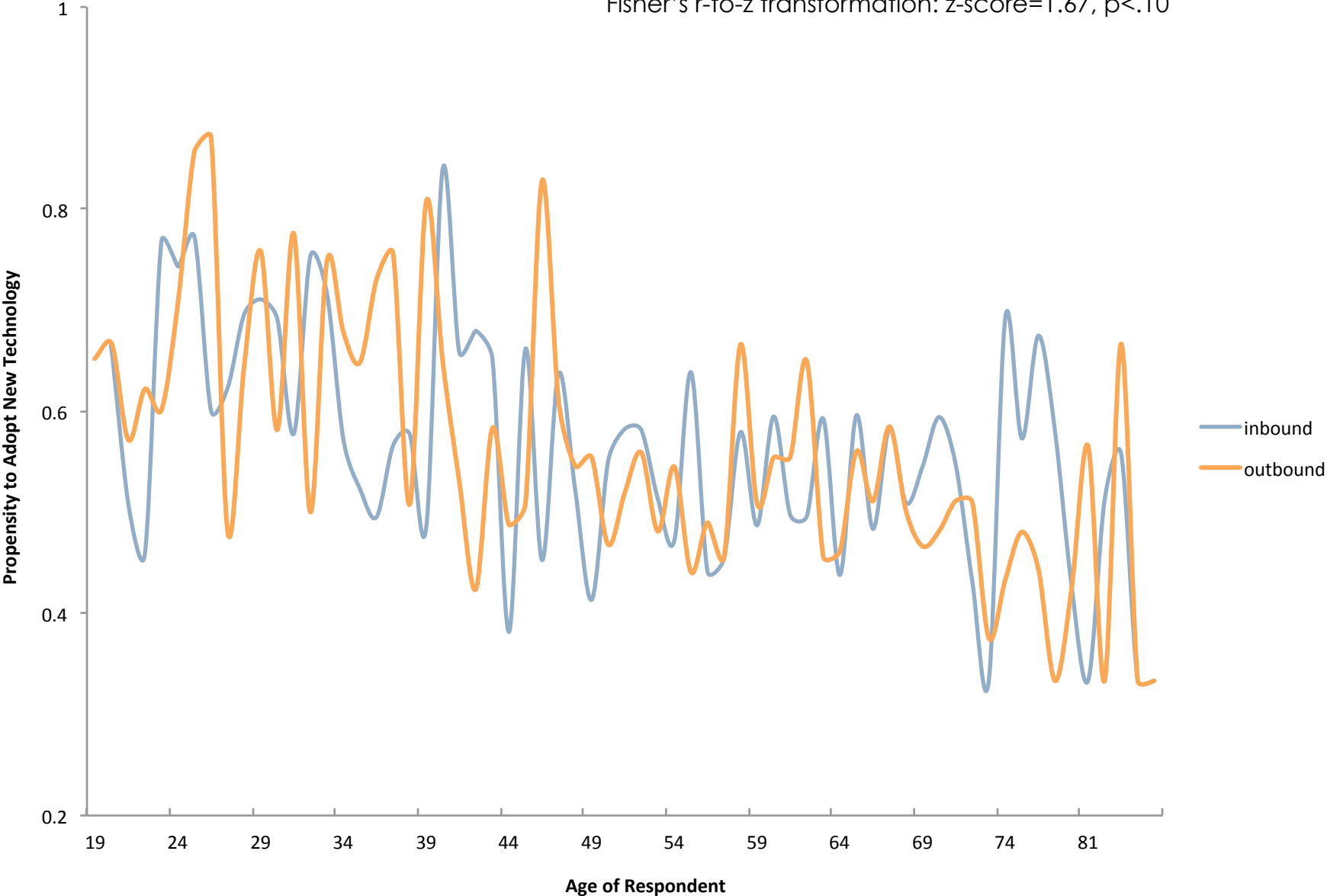
All variables coded to range from 0-1. Error bars reflect confidence interval around each point estimate.

Correlation between age & technology was marginally stronger in outbound sample (r=-.28) than inbound sample (r=-.18)

Fisher's r-to-z transformation: z-score=1.67, p<.10
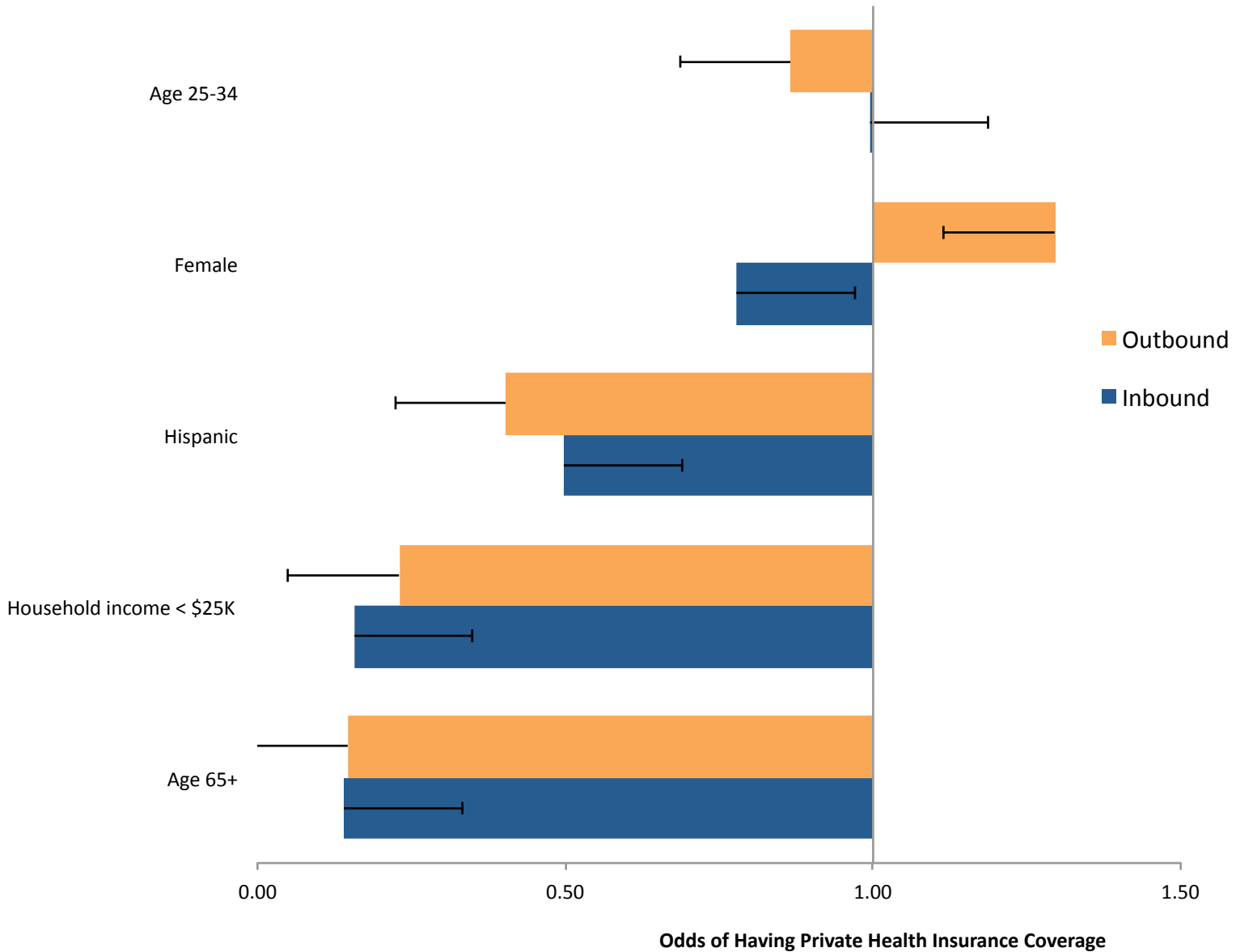

All variables coded to range from 0-1.

Private Health Insurance

- DV = whether respondent has private health insurance coverage, coded as:

  1 = Yes

  0 = No

- IV = demographics associated with insurance:

  - Age
  - Gender
  - Household income
  - Hispanic ethnicity

Model from outbound sample produced effects more in line with past findings on private health insurance coverage

Demographic Attribute Predicting Whether Covered by Private Health Insurance

Age 25-34

Female

Hispanic

Household income < $25K

Age 65+

Outbound
Inbound

0.00   0.50   1.00   1.50

Odds of Having Private Health Insurance Coverage

All variables coded to range from 0-1. Error bars reflect confidence interval around each point estimate.

Profile Variables
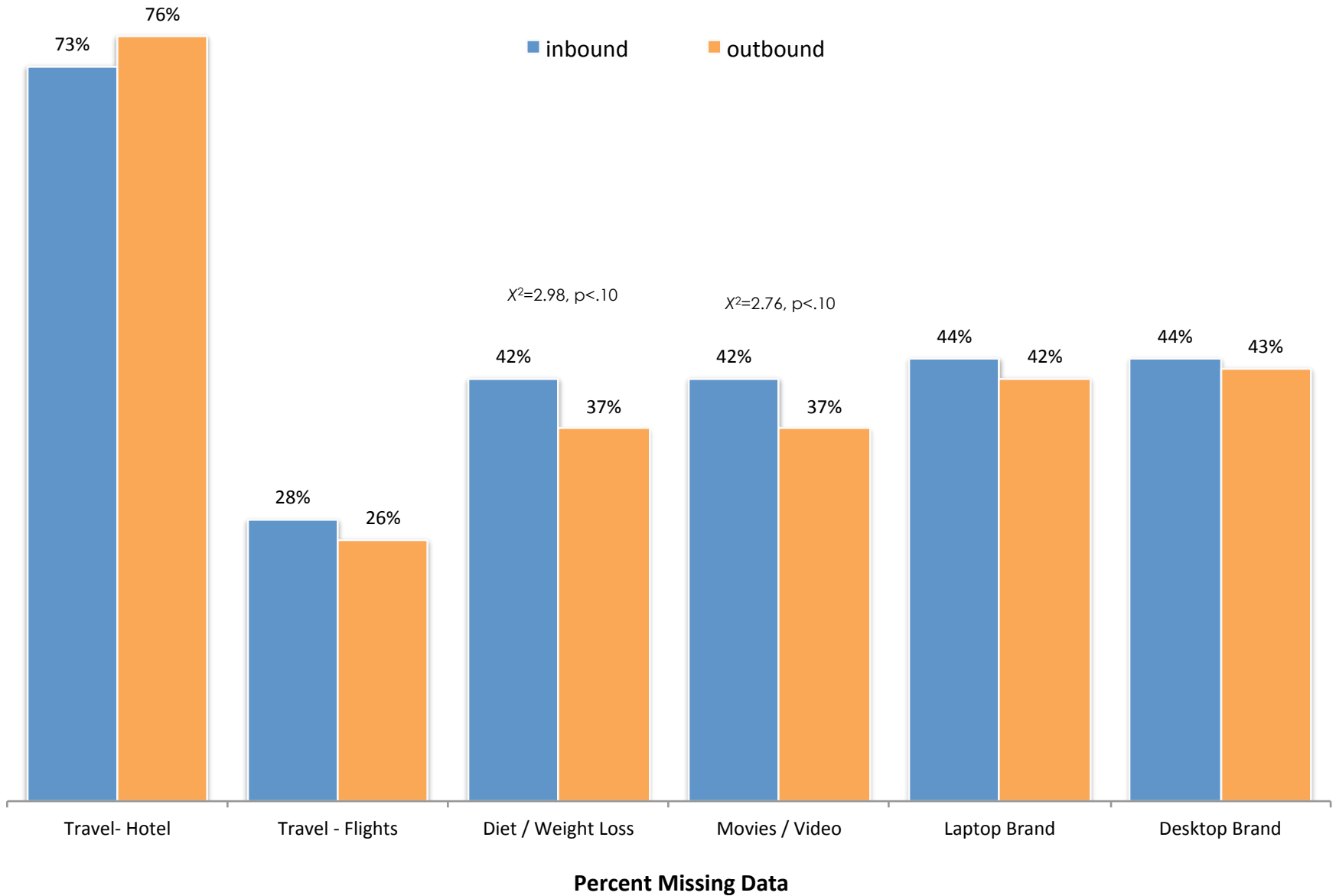
Differences between Samples, Missing Data & Imputations
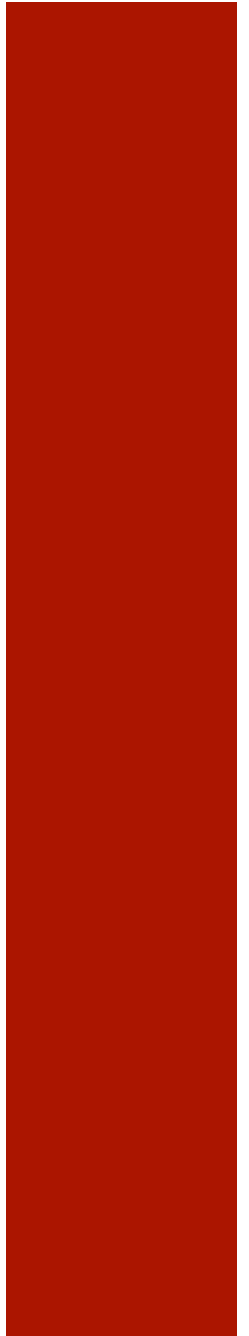
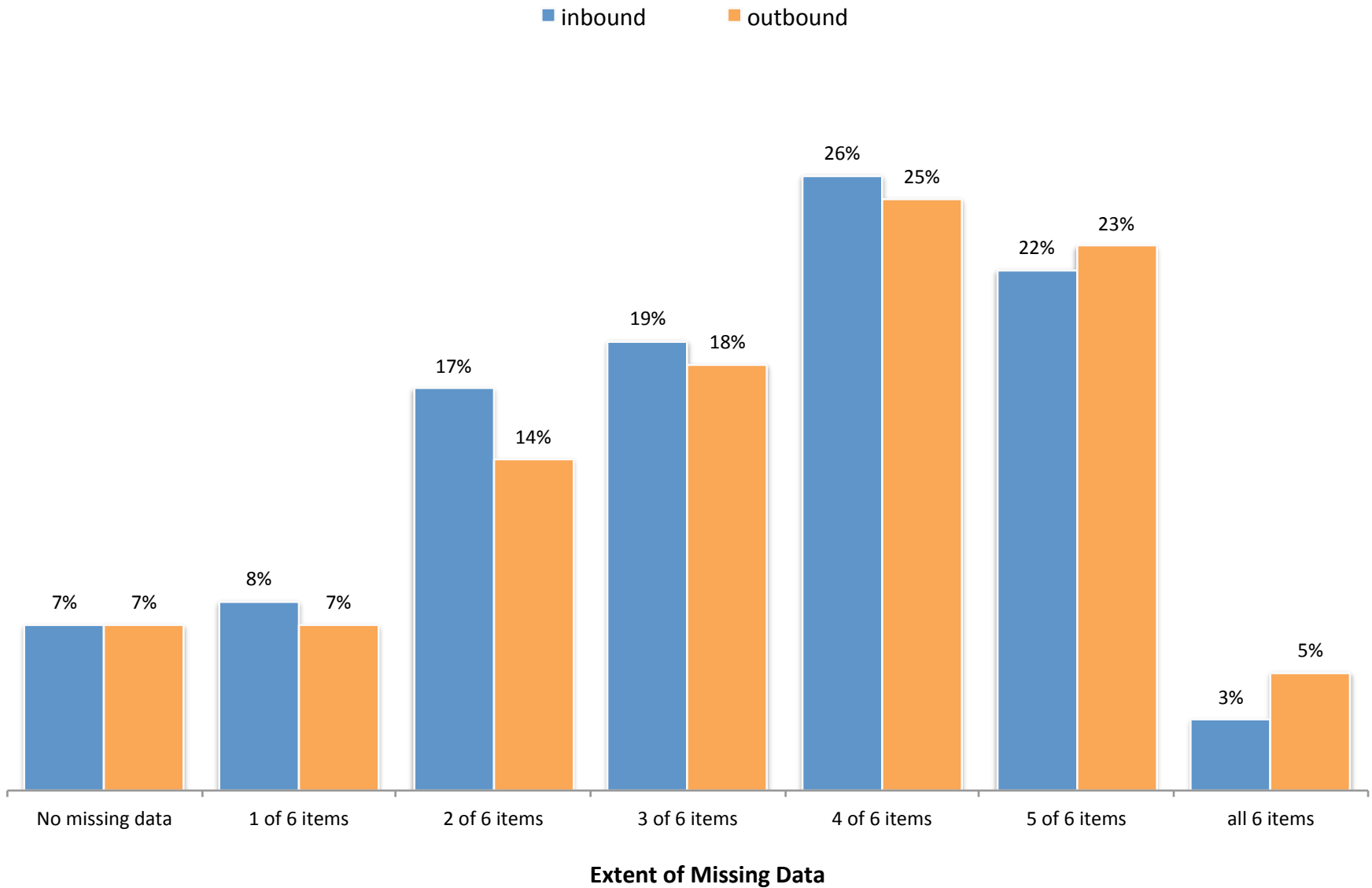# No significant difference between samples on preexisting panel profile variables

	Chi-square Test of Difference between Samples
Travel- Hotel	2.76
Travel - Flights	2.23
Diet / Weight Loss	2.27
Movies / Video	1.17
Laptop Brand	6.04
Desktop Brand	11.42
Number of Significant Differences	**0**

Inbound sample had marginally more missing data than outbound sample on 2 out of 6 background profile items

Legend: ■ inbound ■ outbound

- Travel- Hotel: inbound 73%, outbound 76%
- Travel - Flights: inbound 28%, outbound 26%
- Diet / Weight Loss: X^2=2.98, p<.10; inbound 42%, outbound 37%
- Movies / Video: X^2=2.76, p<.10; inbound 42%, outbound 37%
- Laptop Brand: inbound 44%, outbound 42%
- Desktop Brand: inbound 44%, outbound 43%

Percent Missing Data

However, the two samples did not differ significantly on the extent of missing data across all profile variables combined, p >.70

■ inbound   ■ outbound

Extent of Missing Data

Multiple Imputations of missing data in profile variables based on demographics and substantive survey responses
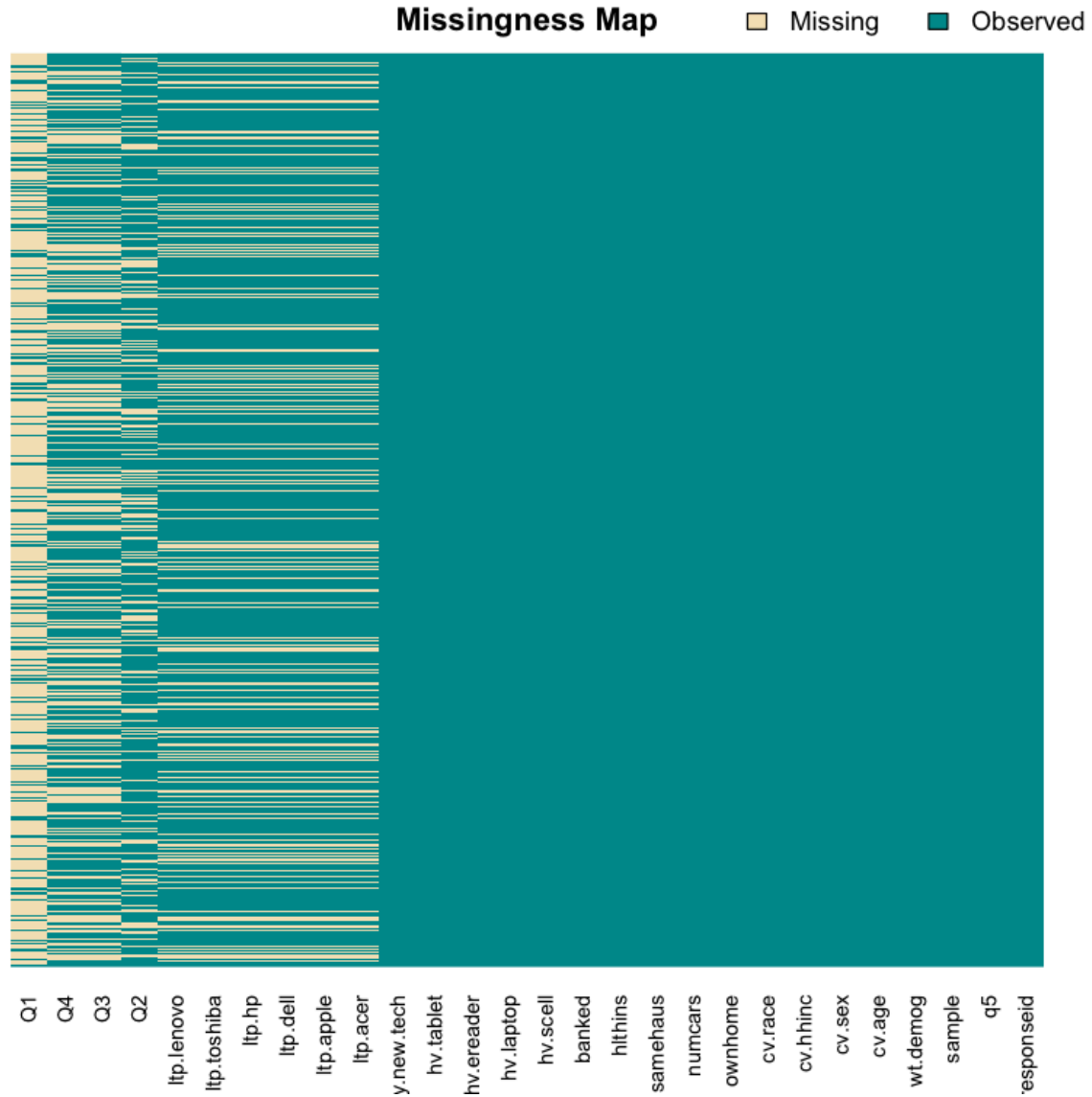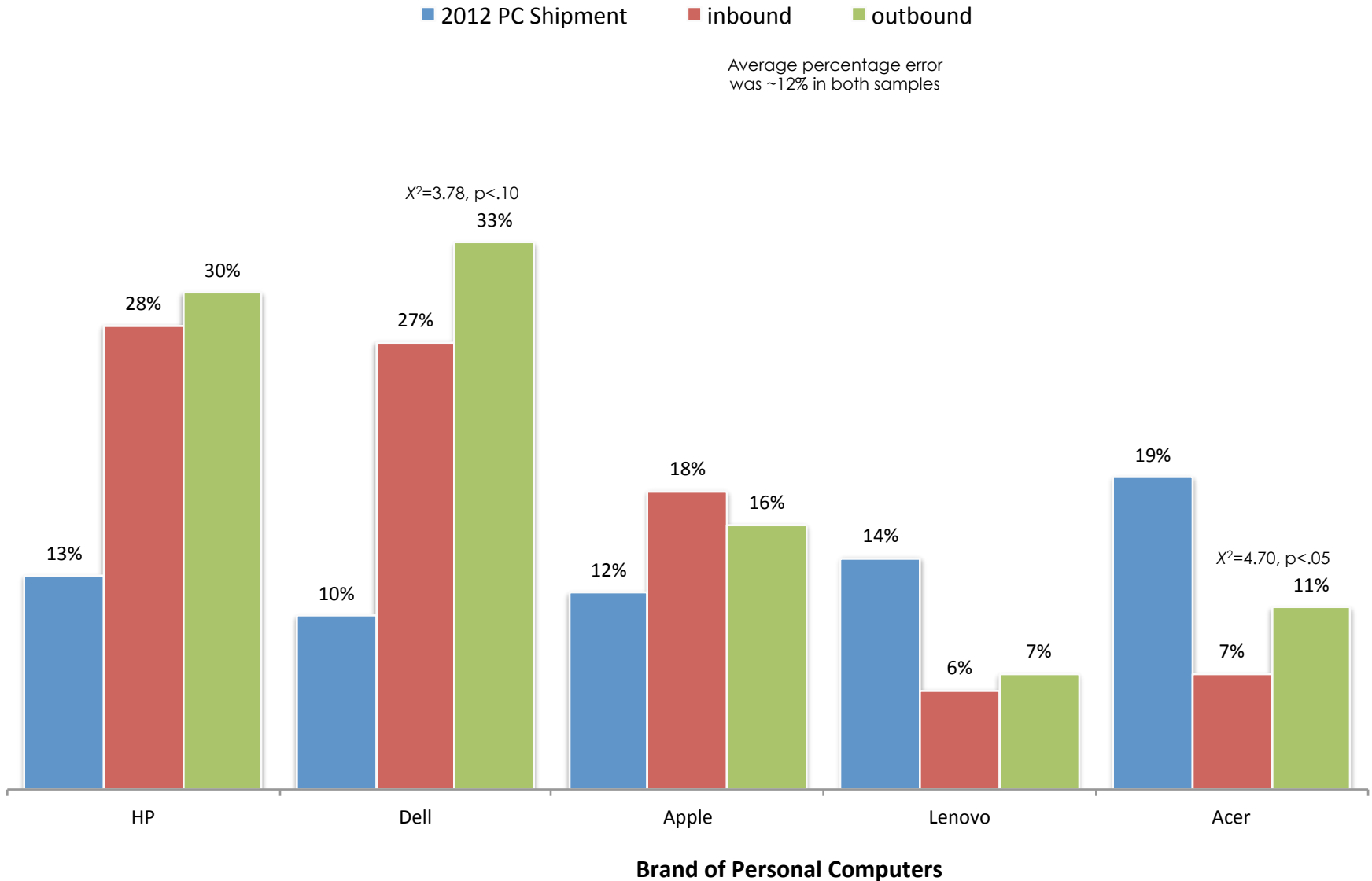
No significant difference emerged between samples on preexisting panel profile variables post-imputations

|	Chi-square Test of Difference (original data)	Chi-square Test of Difference (imputed data)
Travel- Hotel	2.76	3.52
Travel - Flights	2.23	2.76
Diet / Weight Loss	2.27	0.33
Movies / Video	1.17	0.79
Laptop Brand	6.04	4.53
Desktop Brand	11.42	2.57
Number of Significant Differences	**0**	**0**

The two samples rarely differed on ownership of top PC brands, and exhibited same average error from an objective benchmark*

■ 2012 PC Shipment   ■ inbound   ■ outbound

Average percentage error
was ~12% in both samples

X^2=3.78, p<.10

HP: 13%, 28%, 30%

Dell: 10%, 27%, 33%

Apple: 12%, 18%, 16%

Lenovo: 14%, 6%, 7%

Acer: 19%, 7%, 11% X^2=4.70, p<.05

Brand of Personal Computers

* Although PC ownership of a gen pop sample is not expected to match actual PC shipments; the relative ratios of both can serve as proxies of PC market share.
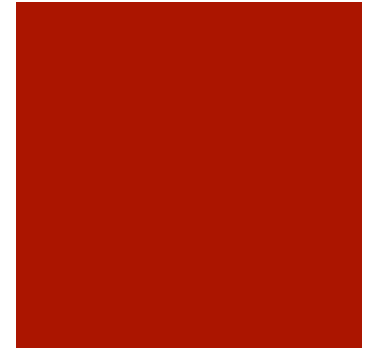
Summary

Key Findings
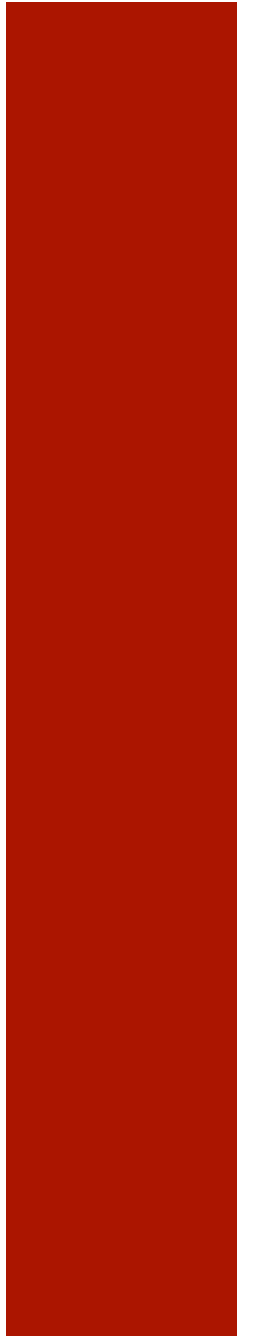
Summary

- Inbound sample (weighted) performed better on point estimates of available benchmarks

- Outbound sample (weighted) performed better on all tests of concurrent validity

- Despite strict quotas, inbound sample required weighting to produce better estimates

- Rim weights improved estimates of many socio-economic attributes BUT not device ownership
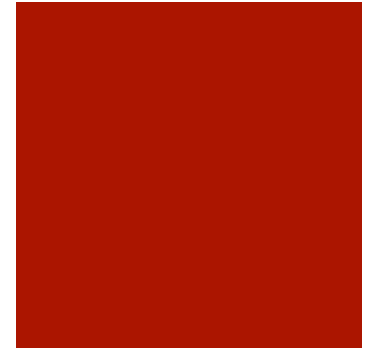
Practical Considerations

- No difference in sample / programming costs

- No difference in length of field period

- No difference in available panel profile data

- Study findings need replication, of course

The End

Thank you for listening