

American Time Use Survey: Who is Missing from the Data and How Much Does it Matter?

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Overview

- American Time Use Survey (ATUS)
response rate under 60 percent in each of the first three years of the survey
 - Reflects both non-contact and refusals
- Because the ATUS sample is drawn from CPS outgoing rotation groups, we have a rich set of variables to use in studying the differences in characteristics between respondents and nonrespondents

Overview

- Nonresponse a source of bias only to the extent that nonrespondents are different from respondents with respect to the variable of interest. If we think about respondents as having a *propensity* to respond:

$$E(\bar{Y}_r - \bar{Y}_n) = E\left[\frac{\sigma_{YP}}{\bar{P}}\right]$$

- We do not observe time use patterns for nonrespondents, but can assess whether estimates are sensitive to reweighting to account for differences in response propensity associated with observable characteristics.

ATUS Design

- Target population: US civilian non-institutionalized population age 15 or older.
- Sample of individuals drawn from households completing their eighth and final interview in the CPS.
- ATUS interviews conducted 2-4 months after the household's last CPS interview.
- ATUS diary days are distributed across days of the week.
 - 10% each day Monday-Friday
 - 25% each Saturday and Sunday
- All interviews are conducted over the telephone.
 - Non-telephone households sent a letter and \$40 incentive to call into the telephone center on a specified day.

Table 1. Sample Disposition, 2004 ATUS

Disposition	Official		Regrouped	
	N	wgt %	N	wgt %
Complete	13,973	56.1	13,973	53.2
Refusal	4,705	18.4	4,705	17.5
Noncontact	1,827	6.5		
NC-1			2,895	11.5
NC-2			3,175	10.3
NC-3			1,827	6.2
Other non-interviews	1,932	8.2	321	1.4
Unknown eligibility	3,175	10.9		
Total eligible sample	25,612	100	26,896	100
Not eligible	1,392		108	
Total	27,004		27,004	

Survey Outcomes

- Using our preferred categorization, noncontact accounts for about 60 percent of ATUS nonresponse
- Design of the ATUS contributes to high rate of noncontact:
 - Telephone only
 - Decision not to track movers
 - Must speak with designated respondent on a designated day

Hypotheses about ATUS Nonresponse

- We consider two hypotheses about nonresponse in the ATUS:
 - Busy people are less likely to respond
 - People who are less socially integrated are less likely to respond
- Higher expected nonresponse rates may be attributable to sample members who cannot be contacted and/or to sample members who refuse to participate

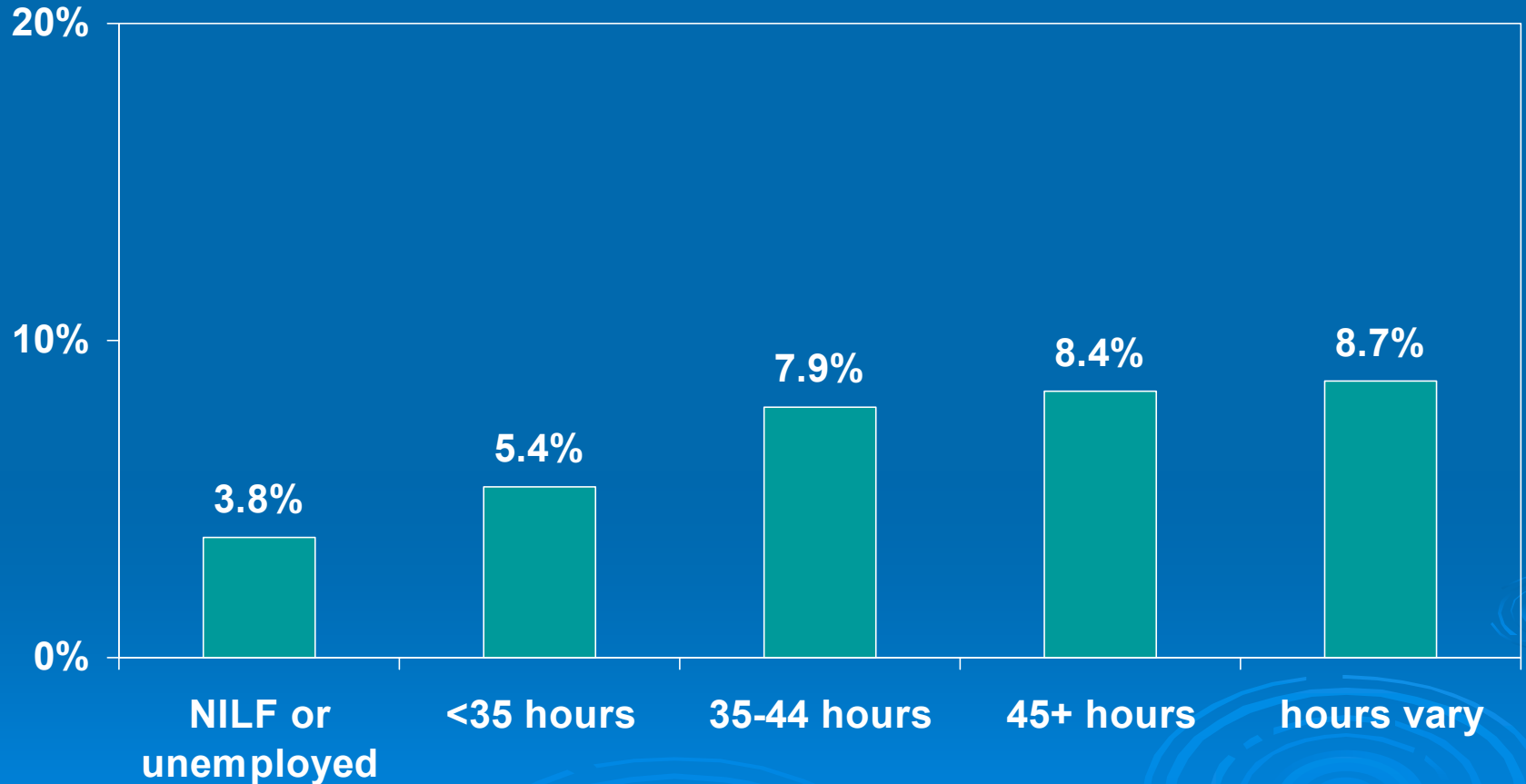
Factors Affecting Nonresponse

- Indicators of “busyness”: Hours of work, spouse’s hours of work, presence of children
- Indicators of “social integration”: Marital status (married versus single, separated), unemployed or out of labor force, presence of children (especially age 6-17), household includes adults other than householder and spouse, own versus rent, telephone in household
- Other personal and household characteristics: Sex, age, race/ethnicity, education, income, urban versus nonurban, region

Busyness Indicators: Hours of Work

<u>Category</u>	<u>Response Rate</u>	<u>Contact Rate</u>	<u>Cooperation Rate</u>
NILF or unemployed	52.1	72.3	72.1
< 35 hours	58.5	75.6	77.3
35-44 hours	51.6	70.2	73.5
45+ hours	57.8	74.7	77.4
Hours vary	52.8	70.6	74.9

Type 3 Noncontact Rates by Hours of Work



Busyness Indicators: Spouse Hours of Work

<u>Category</u>	<u>Response Rate</u>	<u>Contact Rate</u>	<u>Cooperation Rate</u>
NILF or unemployed	57.5	78.4	73.3
< 35 hours	60.3	81.3	74.2
35-44 hours	56.7	78.4	72.3
45+ hours	65.8	82.3	80.0
Hours vary	58.2	81.0	71.9
LF status unknown	62.5	77.4	80.8
No spouse	47.1	64.0	73.6

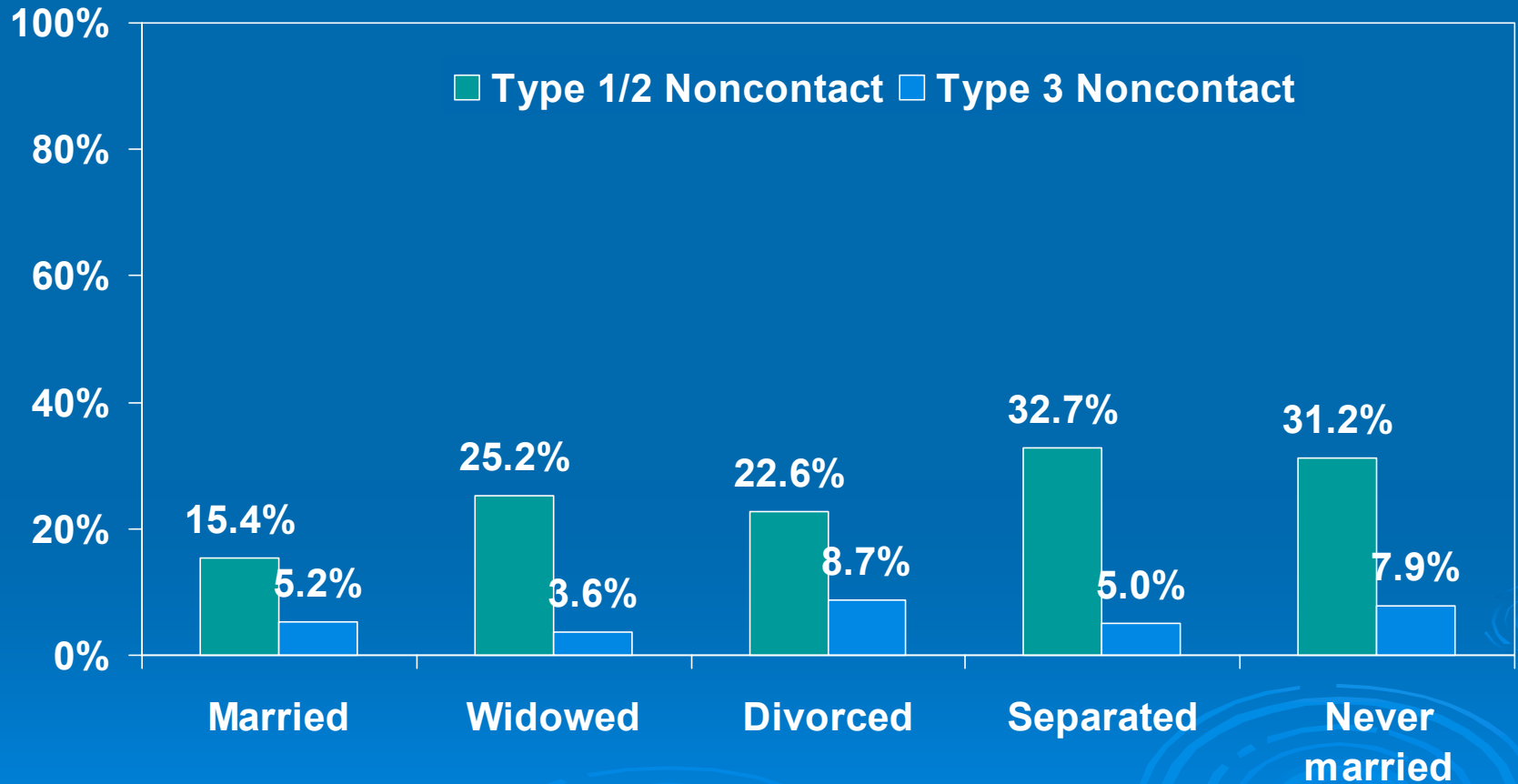
Busyness Indicators: Presence of Children

<u>Category</u>	<u>Response Rate</u>	<u>Contact Rate</u>	<u>Cooperation Rate</u>
Presence of children age 5 and under			
No	53.5	72.7	73.5
Yes	52.0	68.5	75.9
Presence of children age 6-17			
No	53.2	71.9	73.9
Yes	53.4	72.3	73.8

Social Integration Indicators: Marital Status

<u>Category</u>	<u>Response Rate</u>	<u>Contact Rate</u>	<u>Cooperation Rate</u>
Married householder	58.8	79.4	74.0
Widowed	50.7	71.1	71.2
Divorced	51.4	68.6	75.0
Separated	41.0	62.3	65.8
Never married	45.8	61.0	75.1

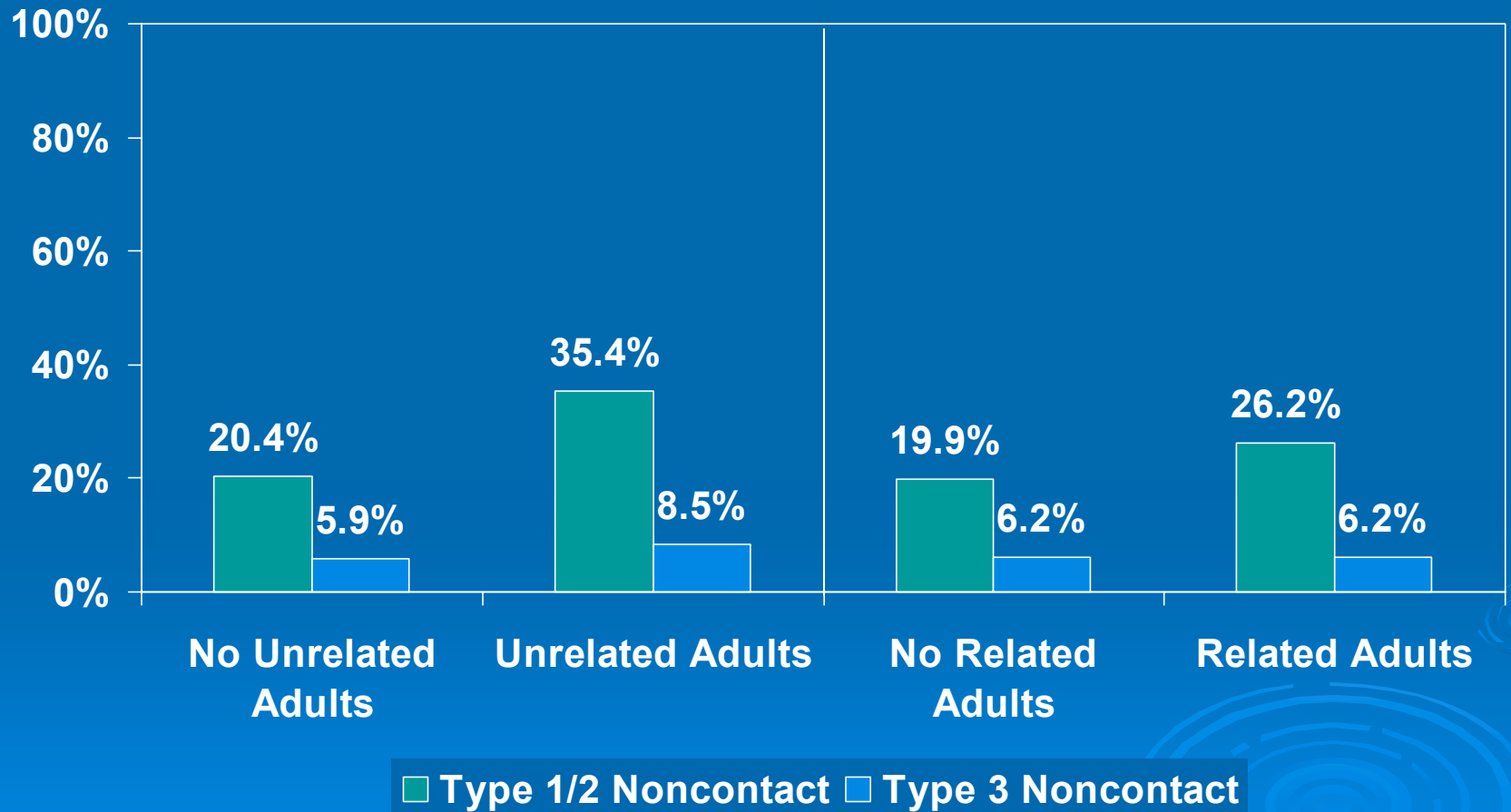
Noncontact Rates by Marital Status



Social Integration Indicators: Presence of Other Adults

<u>Category</u>	<u>Response Rate</u>	<u>Contact Rate</u>	<u>Cooperation Rate</u>
Presence of adults not related to the householder			
No	54.5	73.7	73.9
Yes	41.0	56.0	73.2
Presence of adults related to the householder			
No	55.3	73.9	74.8
Yes	48.2	67.6	71.3

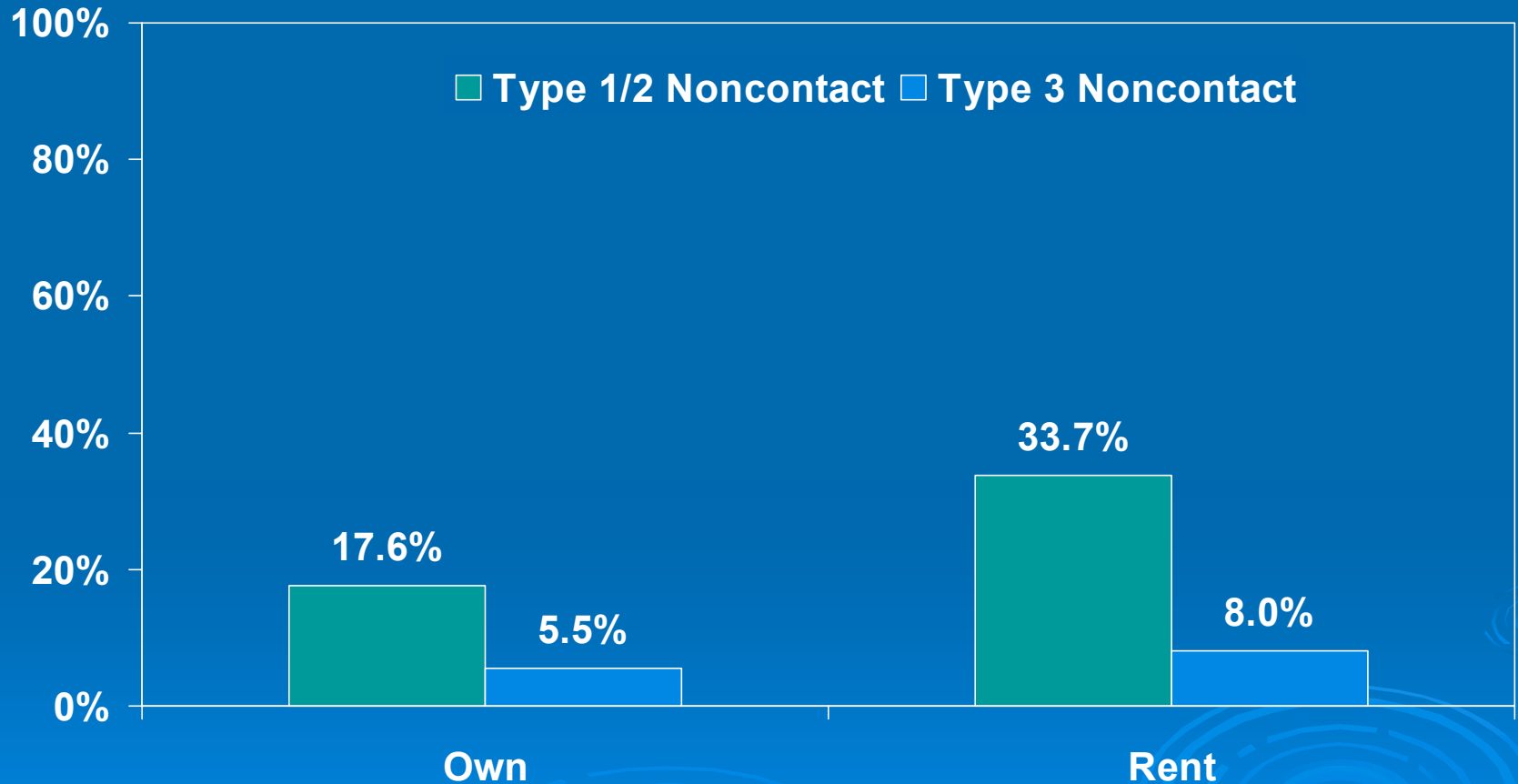
Noncontact Rates by Presence of Other Adults



Social Integration Indicators: Housing Tenure

<u>Category</u>	<u>Response Rate</u>	<u>Contact Rate</u>	<u>Cooperation Rate</u>
Own	56.9	76.8	74.0
Rent	42.5	58.4	72.8

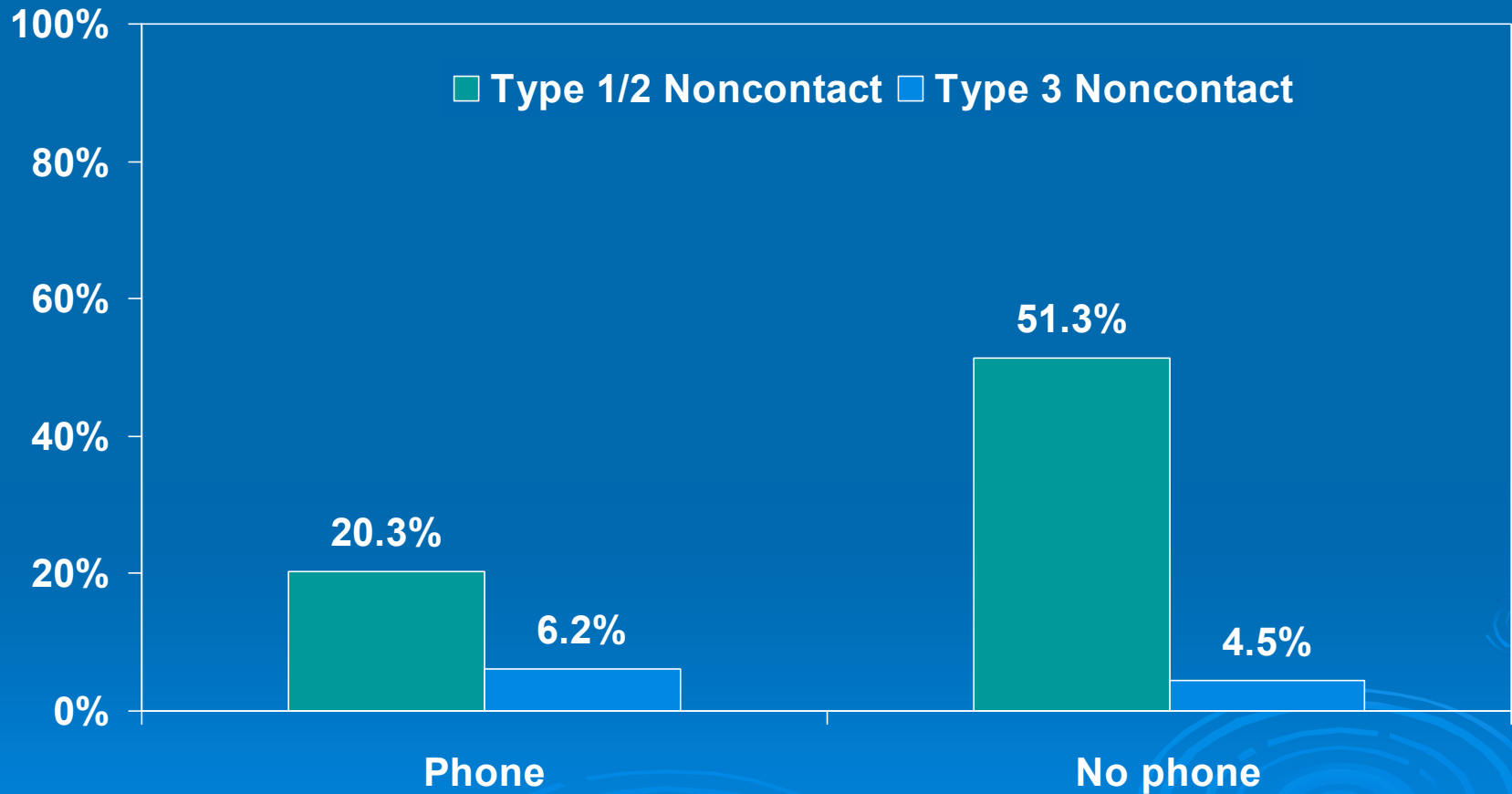
Noncontact Rates by Housing Tenure



Social Integration Indicators: Telephone Status

<u>Category</u>	<u>Response Rate</u>	<u>Contact Rate</u>	<u>Cooperation Rate</u>
Phone	54.1	73.4	73.7
No phone	35.7	44.2	80.6

Noncontact Rates by Telephone Status



Modeling Response Propensities

- In addition to looking at simple tabulations, we also estimated logit nonresponse propensity models.
- The same factors associated with response rate differences in the simple tabulations generally significant in the logit models, though magnitude of effects tends to be smaller.
- One new result: Presence of children age 6-17 reduces nonresponse rates for single parents, but not for married parents.

Summary of Evidence on Patterns of Nonresponse

- Individuals with different characteristics have significantly different response propensities.
 - Average response propensity 28 percent for those in bottom 10 percent of the distribution versus 74 percent for those in the top 10 percent
- Personal and household characteristics associated with nonresponse more consistent with the “social integration” hypothesis than with the “busyness” hypothesis.
- Variation in contact rates more important than variation in cooperation rates in explaining differences across groups.
 - One exception those for whom household income data missing.

Weighting Adjustments to Account for Nonresponse

- Nonresponse model can be used to calculate a *response propensity* for each respondent.
- The inverse of each individual's response propensity can be used to calculate new weights.
- Also need to include CPS base weights and apply a day-of-week adjustment
- New final weights for estimation equal to:

$$W_{final} = W_{base} \times W_{nonresponse} \times W_{day}$$

- Similar to approach taken by BLS to produce final estimates, except that we account for marital status, hours worked, ages of children, presence of other adults in household, rent/own and urbanicity in addition to race, sex, age, presence of children and education

How much does the weight adjustment matter?

- Weight adjustments have little effect on the survey estimates
 - Our weights produce slightly lower estimates of work activity and slightly higher estimates of leisure time activity than the BLS weights, but differences very small (on the order of about 5 minutes per day).
 - Average difference over all activities is about 1 minute per day

Limitations

- Does not account for nonresponse to the wave eight interview in the CPS.
- Results do not establish definitively that there is an absence of nonresponse bias in the survey estimates.
 - Suggests that the variables in our models are not highly correlated with the examined measures of time use.
 - Other variables could be highly correlated with both nonresponse and time use.

Extending the Research

- Together with Sara Helms and Stanley Presser, have been looking at measures of volunteer activity
- We hypothesize that volunteers are more likely than non-volunteers to respond to the ATUS and that this causes upward bias in ATUS measures of volunteer time
- Can test this hypothesis using data from CPS supplements on volunteer activity

2003 CPS Supplement Estimates of Volunteer Activity by ATUS Response Status

	Percent Who Volunteer	Mean Hours Among Volunteers	Overall Mean Hours
ATUS Respondents	35.5	131.3	46.5
ATUS Non-respondents	20.1	131.6	26.4

Preliminary Conclusions

- Nonresponse causes upward bias in ATUS estimates of volunteer activity
 - Further analysis suggests that conclusions about correlates of volunteer activity based on ATUS data are more robust
- Bias in estimates of volunteer activity likely a more general problem
- Because survey response rates have trended downwards over time, upward bias in estimates of volunteer activity may have become more serious