

# Time Use, Response Rates, and Data Quality by Time of Day

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# Research Question

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- Can time use surveys counteract the trend of falling response rates by increasing the allowed recall period? Or, would this damage the quality of the data?
- Is there a clear relationship between the length of the recall period and data quality?

# What is the ATUS?

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- A continuous survey about how, where, and with whom Americans spend their time
- Core component: the “time diary”
- Also collects info about respondents’
  - ▶ Demographics
  - ▶ Labor force status, occupation, earnings
  - ▶ Household composition

# ATUS Basics

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- A Bureau of Labor Statistics survey, conducted by the U.S. Census Bureau
- Nationally-representative of persons age 15 and over
- A 20-minute computer-assisted interview conducted by telephone
- Sample is drawn from households that have completed MIS-8 of the CPS

# ATUS interviews 1 person per household about 1 day



Randomly select individual age 15 or over

*Half of interviews are conducted about a weekday and half about a weekend day*

Randomly assign day of week

Interview day



## So let's begin. Yesterday, Monday, at 4:00 AM, what were you doing?

- Use the slash key (/) for recording separate/simultaneous activities.
- Do not use precodes for secondary activities.

- |                              |                                 |                                    |
|------------------------------|---------------------------------|------------------------------------|
| 1. Sleeping                  | 8. Cleaning kitchen             | 30. Don't know/Can't remember      |
| 2. Grooming (self)           | 9. Laundry                      | 31. Refusal/ None of your business |
| 3. Watching TV               | 10. Grocery shopping            |                                    |
| 4. Working at main job       | 11. Attending religious service |                                    |
| 5. Working at other job      | 12. Paying household bills      |                                    |
| 6. Preparing meals or snacks | 13. Caring for animals and pets |                                    |
| 7. Eating and drinking       |                                 |                                    |

	Start	ID	Activity	TIME	Hrs	Mins	Stop	Who	Who_2	Where	Where specify
[1]	4:00AM		Sleeping	2	8	0	12:00PM				
[2]	12:00PM		Preparing meals and snacks	1	1	0	1:00PM	0		1	Respondent's home
[3]	1:00PM		playing with kids	1		1	1:01PM	2		1	Respondent's home
[4]	1:01PM		Grooming	1	2	0	3:01PM				

# Data and Methods

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- ATUS data from interviews conducted in 2008, 2009, and 2010
  - ▶ All interviews including approximately 900 interviews that were later excluded due to poor data quality
  - ▶ Key information about interviews is taken from call history file including time of interview for those interviews that were completed

# Data and Methods

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## ■ Methods

- ▶ Assign each respondent's interview time to a call block
  - Call block 1 – 6:00 to 8:59 am
  - Call block 2 – 9:00 to 11:59 am
  - Call block 3 – 12:00 to 2:59 pm
  - Call block 4 – 3:00 to 5:59 pm
  - Call block 5 – 6:00 to 8:59 pm
  - Call block 6 – 9:00 to 11:59 pm



# Data and Methods

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## ■ Methods

### ▶ Data quality measures

- Average number of episodes reported
- Percent of good cases
- Percent reporting 5 or fewer activities\*
- Percent with 180 minutes of DK/RF\*
- Average time spent in diary section of interview per activity

\*cases we would remove through the normal data quality checks

# Data and Methods

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- Descriptive analysis by call block
  - ▶ Demographics
  - ▶ Time use patterns
- Data quality measures by call block
  - ▶ Total – all diary days
  - ▶ Weekday and Weekend day diaries
- Regression analysis

# DESCRIPTIVE STATISTICS

# Descriptive Statistics

## Percent Distribution of Calls by Sex

CB	Time	Total	Men	Women
1	6 - 9 am	3.3	3.2	3.4
2	9 am - noon	28.4	26.8	29.7
3	Noon – 3 pm	19.1	18.4	19.6
4	3 – 6 pm	22.2	22.3	22.2
5	6 – 9 pm	24.2	26.3	22.6
6	9 pm - midnight	2.7	2.9	2.6
Total		100	100	100

# Percent Distribution of Calls Men by Age Group

CB	Time	15-19	20-60	61 and older
1	6 - 9 am	1.1	2.9	5.1
2	9 am - noon	13.2	23.9	41.1
3	Noon – 3 pm	20.4	17.7	20.1
4	3 – 6 pm	31.8	22.8	17.7
5	6 – 9 pm	30.4	29.3	14.8
6	9 pm - midnight	3.0	3.4	1.3
Total		100	100	100

# Percent Distribution of Calls Women by Age Group

CB	Time	15-19	20-60	61 and older
1	6 - 9 am	0.8	2.7	5.8
2	9 am - noon	15.2	26.1	41.8
3	Noon – 3 pm	19.2	19.1	21.0
4	3 – 6 pm	32.9	23.1	17.4
5	6 – 9 pm	27.5	26.0	12.8
6	9 pm - midnight	4.4	3.0	1.1
Total		100	100	100

# Percent Distribution of Calls by Household Composition

CB	Time	Singles only	Couples only	Couples plus	Other Multi
1	6 - 9 am	4.6	4.0	2.8	2.4
2	9 am - noon	36.1	32.4	24.5	23.2
3	Noon – 3 pm	21.1	18.6	17.3	19.7
4	3 – 6 pm	20.0	20.2	22.4	25.4
5	6 – 9 pm	16.5	22.5	29.5	26.2
6	9 pm - midnight	1.7	2.3	3.5	3.1
Total		100	100	100	100

# Average Selected Characteristics by Call Block

CB	Time	Average Age	Percent Employed	Percent White	Percent Hispanic
1	6 - 9 am	54.2	44.1	80.4	11.1
2	9 am - noon	52.0	50.0	79.9	11.9
3	Noon – 3 pm	47.6	56.2	80.2	14.0
4	3 – 6 pm	44.4	65.0	80.3	15.7
5	6 – 9 pm	43.0	76.8	80.8	14.6
6	9 pm - midnight	42.1	77.5	77.5	14.5
Total		47.0	61.6	80.2	13.9



# DATA QUALITY

# Data Quality (Percent Good Cases) by Call Block

CB	Time	Total	Weekday	Weekend days
1	6 - 9 am	97.9	98.2	97.3
2	9 am - noon	97.1	97.3	97.0
3	Noon – 3 pm	97.2	97.4	97.1
4	3 – 6 pm	98.0	98.4	97.6
5	6 – 9 pm	98.4	98.6	98.2
6	9 pm - midnight	99.0	99.2	98.7
Total		97.7	97.9	97.5

# Data Quality (Percent with 180 minutes + of DK/RF) by Call Block

CB	Time	Total	Weekday	Weekend days
1	6 - 9 am	2.0	1.6	2.7
2	9 am - noon	2.3	2.3	2.3
3	Noon – 3 pm	2.2	2.1	2.2
4	3 – 6 pm	1.7	1.4	2.0
5	6 – 9 pm	1.2	1.0	1.4
6	9 pm - midnight	0.6	0.6	0.6
Total		1.8	1.6	2.0

# Data Quality (Percent reporting <5 episodes) by Call Block

CB	Time	Total	Weekday	Weekend days
1	6 - 9 am	0.2	0.2	0.0
2	9 am - noon	0.6	0.5	0.7
3	Noon – 3 pm	0.6	0.5	0.7
4	3 – 6 pm	0.3	0.3	0.4
5	6 – 9 pm	0.4	0.4	0.4
6	9 pm - midnight	0.4	0.2	0.6
Total		0.5	0.4	0.5

# Data Quality (Number of Episodes) by Call Block

CB	Time	Total	Weekday	Weekend days
1	6 - 9 am	19.8	20.5	18.3
2	9 am - noon	19.7	20.9	18.4
3	Noon – 3 pm	19.2	20.3	18.5
4	3 – 6 pm	19.5	20.8	18.4
5	6 – 9 pm	19.6	20.4	18.8
6	9 pm - midnight	20.0	20.5	19.5
Total		19.6	20.6	18.6

# REGRESSION ANALYSIS

# Regression Analysis

## Number of Activities

Variable	Estimate	Std Err	T-Value
<b>Intercept</b>	<b>11.491*</b>	<b>0.380</b>	<b>30.221</b>
<b>Women</b>	<b>3.292*</b>	<b>0.080</b>	<b>40.985</b>
<b>Age</b>	<b>-0.024*</b>	<b>0.002</b>	<b>-10.386</b>
<b>Weekday</b>	<b>2.077*</b>	<b>0.080</b>	<b>25.957</b>
<b>Good_case</b>	<b>6.696*</b>	<b>0.268</b>	<b>24.990</b>
y2009	-0.101	0.098	-1.030
<b>y2010</b>	<b>-0.552*</b>	<b>0.098</b>	<b>-5.659</b>
Call Block 2	0.153	0.231	0.661
Call Block 3	-0.157	0.238	-0.660
Call Block 4	-0.060	0.235	-0.255
Call Block 5	0.022	0.234	0.093
Call Block 6	0.223	0.326	0.683

# Regression Analysis

## Minutes of “data codes” in diary

Variable	Estimate	Std Err	T-Value
Intercept	<b>293.560*</b>	<b>3.069</b>	<b>95.656</b>
Women	<b>2.439*</b>	<b>0.648</b>	<b>3.761</b>
Age	<b>0.121*</b>	<b>0.019</b>	<b>6.523</b>
Weekday	0.087	0.646	0.135
Good_case	<b>-289.009*</b>	<b>2.163</b>	<b>-133.636</b>
y2009	<b>2.114*</b>	<b>0.790</b>	<b>2.675</b>
y2010	<b>8.049*</b>	<b>0.787</b>	<b>10.221</b>
Call Block 2	0.354	1.863	0.190
Call Block 3	0.093	1.918	0.048
Call Block 4	0.446	1.900	0.235
Call Block 5	-2.211	1.890	-1.169
Call Block 6	-2.188	2.631	-0.831



# Regression Analysis

## Minutes per activity in diary

Variable	Estimate	Std Err	T-Value
<b>Intercept</b>	<b>0.673*</b>	<b>0.011</b>	<b>58.954</b>
Women	0.001	0.002	0.266
<b>Age</b>	<b>0.001*</b>	<b>0.000</b>	<b>15.023</b>
<b>Weekday</b>	<b>-0.007*</b>	<b>0.002</b>	<b>-2.817</b>
<b>Good_case</b>	<b>-0.232*</b>	<b>0.008</b>	<b>-28.816</b>
y2009	0.005	0.003	1.817
<b>y2010</b>	<b>0.052*</b>	<b>0.003</b>	<b>17.845</b>
Call Block 2	-0.001	0.007	-0.120
Call Block 3	0.010	0.007	1.428
<b>Call Block 4</b>	<b>0.035*</b>	<b>0.007</b>	<b>5.000</b>
<b>Call Block 5</b>	<b>0.042*</b>	<b>0.007</b>	<b>5.907</b>
<b>Call Block 6</b>	<b>0.052*</b>	<b>0.010</b>	<b>5.339</b>

# TIME USE PATTERNS

# Results: Time Use Patterns

CB	Time	Average hours spent in SLEEP	Average hours spent in FOOD PREP AND CLEANUP	Average hours spent VOLUNTEERING
1	6 - 9 am	8.82	.59	.17
2	9 am - noon	8.74	.66	.19
3	Noon – 3 pm	8.78	.64	.16
4	3 – 6 pm	8.93	.59	.16
5	6 – 9 pm	8.84	.57	.19
6	9 pm - midnight	8.77	.55	.16

# Results: Time Use Patterns

CB	Time	Average hours spent in CARE OF HH CHILDREN	Average hours spent in CARE OF HH ADULTS	Average hours spent WORKING
1	6 - 9 am	.48	.02	2.82
2	9 am - noon	.39	.03	2.44
3	Noon – 3 pm	.45	.03	2.18
4	3 – 6 pm	.48	.03	2.20
5	6 – 9 pm	.49	.02	2.92
6	9 pm - midnight	.51	.02	3.85

# Results: Time Use Patterns

CB	Time	Average hours spent in LEISURE	Average hours spent WATCHING TV	Average hours spent SOCIALIZING AND COMMUNICATING
1	6 - 9 am	5.45	2.90	.79
2	9 am - noon	5.84	3.29	.65
3	Noon – 3 pm	5.88	3.18	.81
4	3 – 6 pm	5.85	3.06	.88
5	6 – 9 pm	5.33	2.77	.81
6	9 pm - midnight	4.78	2.57	.71

# Conclusions

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- Not much variation in data quality and time use measures by time of day the interview was completed
- Demographic factors (age, sex) outweighed any impact from time of day

# Contact Information

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American Time Use Survey

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