Using the American Time-Use Survey for Travel-Behavior Research
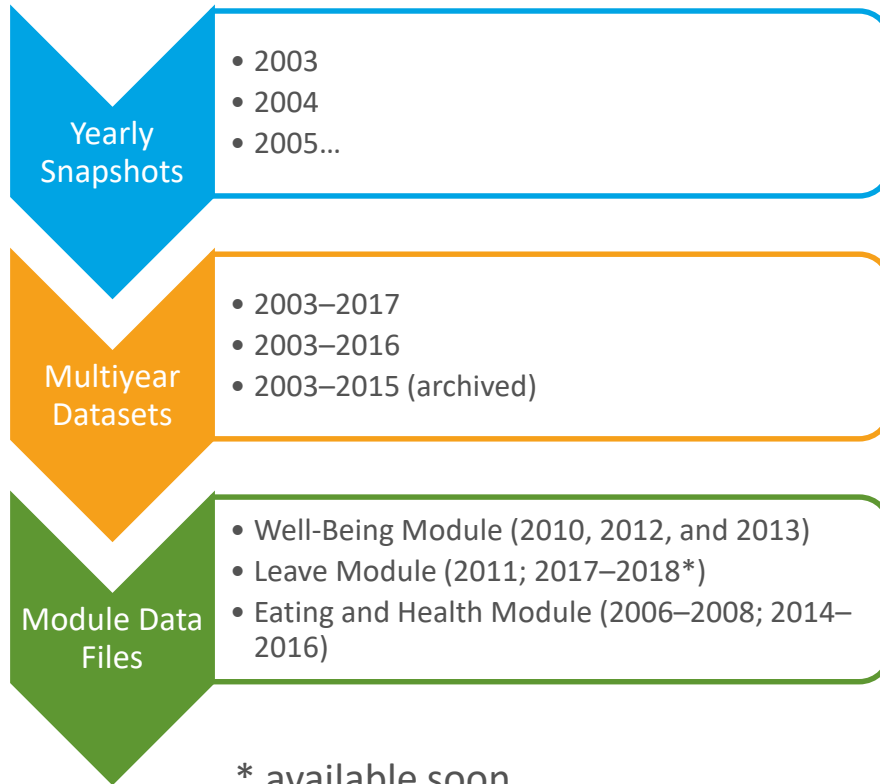
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Opportunities to Leverage Existing National Data Sources for

Passenger Travel Analyses

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What is the American Time-Use Survey (ATUS)?

- ATUS provides nationally representative estimates of how, where, and with whom Americans spend their time
  - Conducted annually by the Bureau of Labor Statistics and the Census Bureau in the United States
  - Only federal survey providing data on the full range of nonmarket activities—from childcare to volunteering

- Repeated cross-sectional data for 2003–2017 with a total of 190,000 interviews

- ATUS data files can be linked to data files from the Current Population Survey (CPS)

What and How?

Yearly Snapshots
- 2003
- 2004
- 2005…

Multiyear Datasets
- 2003–2017
- 2003–2016
- 2003–2015 (archived)

Module Data Files
- Well-Being Module (2010, 2012, and 2013)
- Leave Module (2011; 2017–2018*)
- Eating and Health Module (2006–2008; 2014–2016)

* available soon

- Data files are in CSV format

- Programs that will read the data file into SAS, SPSS, and Stata are provided

ATUS Data Files

Activity File — Includes activity-level information collected in the ATUS

Respondent File — Contains information about ATUS respondents, including their labor force status and earnings

Roster File — Contains information about the age, sex, and relationship to the ATUS respondent for every household member

Who File — Contains codes that indicate who was present during each activity

Eldercare Roster File — Contains information about people for whom ATUS respondents provided care

ATUS-CPS File — Includes information collected during the final interview of the CPS for all persons selected to participate in the ATUS

Eating and Health
Information related to eating, meal preparation, and health

Well-Being Module
How people felt during selected activities, as well as general health information

Leave Module
Information related to workers' access to paid and unpaid leave from their jobs, and their ability to adjust their work schedules and locations

How to Use ATUS Files

How to use ATUS microdata files

Researchers can produce their own time-use estimates using the ATUS microdata files. The ATUS data files include information for over 190,000 respondents total from 2003 to 2017. Because of the size of these data files, it is easiest to work with them using statistical software such as Stata, SAS, or SPSS.

There are several key pieces of documentation that will aid you when working with the data files. The ATUS User's Guide (PDF) includes information about how to link the data files and use them to produce estimates and standard errors. The Data Dictionaries include variable definitions. The Activity Coding Lexicons provide information about the activity codes. If you would like some hints about useful variables and where to find them, read the ATUS documentation about Frequently Used Variables (PDF).

LINKING THE ATUS DATA FILES:

Each of the ATUS microdata files contains useful information, but to produce most estimates, the files must be linked. All of the microdata files contain the variable TUCASEID, which is the ATUS identification number. TUACTIVITY_N (the activity line number) and TULINENO (the person line number) are two additional linking variables that can be used in conjunction with TUCASEID.

1. BASIC ATUS DATA FILES

File	Linking Variables
Respondent file	TUCASEID TULINENO (always equal to 1 on the Respondent file)
Roster file	TUCASEID TULINENO
Activity file	TUCASEID TUACTIVITY_N

PRODUCING TIME-USE ESTIMATES:

Researchers often are interested in estimates of the amount of time Americans spend doing a specific activity, such as the average time Americans watched television in 2003. This type of estimate can be generated by using the Basic ATUS data files. The simplest way to generate an estimate about time use on an average day involves using the ATUS Activity Summary file. Researchers who wish to investigate more complicated questions, such as the amount of time Americans spent watching TV with a family member, will need to link multiple files. To answer this particular question, researchers would need to link the ATUS Respondent file (to obtain the statistical weight), the ATUS Activity file (to obtain activity information and duration), and the ATUS Who file (to obtain information about who was with the respondent during each activity). Those generating estimates using the module files in addition to the basic or additional ATUS files should use the module weights. For more information about how to calculate estimates, see Chapter 7 and Appendix J of the ATUS User's Guide (PDF).

ATUS Activity Lexicon

- Six-digit lexicon (for example: 010201 ➜ washing, dressing, and grooming oneself)
    - Bathing/showering
    - Brushing/flossing teeth
    - Grooming
    - …..

- Can be aggregated to four-digit or two-digit lexicon

ATUS Code	Description (ATUS)	Types of Activities Included (ATUS)	New Description
1	Personal care	Sleeping, grooming, health-related self-care	Personal business and errands
7	Consumer purchases	Shopping (store, phone, internet), researching purchases	Shopping
11	Eating and drinking	Eating, drinking, and waiting associated with it	Eat meal
12	Socializing, relaxing, and leisure	Socializing and communicating, attending or hosting social events, relaxing and leisure	Social

Activity Patterns, Time Use, and Travel of the Millennial Generation

Motivation

- Millennial generation (sometimes referred to as Generation Y) born between 1979 and 2003

- Licensure among 20–24 year olds declined from 87% in 1994 to 78% in 2013 (FHWA, 1994; FHWA, 2015)

- Literature alluding to millennials as the "go-nowhere" generation (Buchholz & Buchholz, 2012; McDonald, 2015)

- Question: Will these differences persist as millennials age?

Data Used

- ATUS multiyear data (2003–2013)

- Pooled survey cross-sections for 2003–2004, 2007–2008, and 2012–2013

- Maximize range in the period covered and capture effects of the recession, if any, in analysis

- Analysis is limited to adults (18 years or older)

Definition	Born Between
Younger Millennials	1988–1994
Older Millennials	1979–1985
GenX1 (Younger)	1973–1978
GenX2 (Older)	1967–1972

Activity Categories

Personal care (except sleep)

Sleep

Household activities

Caring for and helping household members

Sports, exercise, and recreation

Work and work-related activities

Education

Consumer purchases

Eating and drinking

Socializing, relaxing, and leisure

Caring for and helping non-household members

Travel

Unable to code

Other*

- 'Other' category includes household services, government services and civic obligations, telephone calls, professional and personal care services, religious and spiritual activities, and volunteer activities

- Total for "other" category is ~ 25 min/day

Objectives

Evolution of Time-Use Patterns (Aging Effect)

- Gen X → Born 1965–1978
- Millennials → Born 1979–1999

Comparison of Time-Use Patterns at Same Age (Cohort Effect)
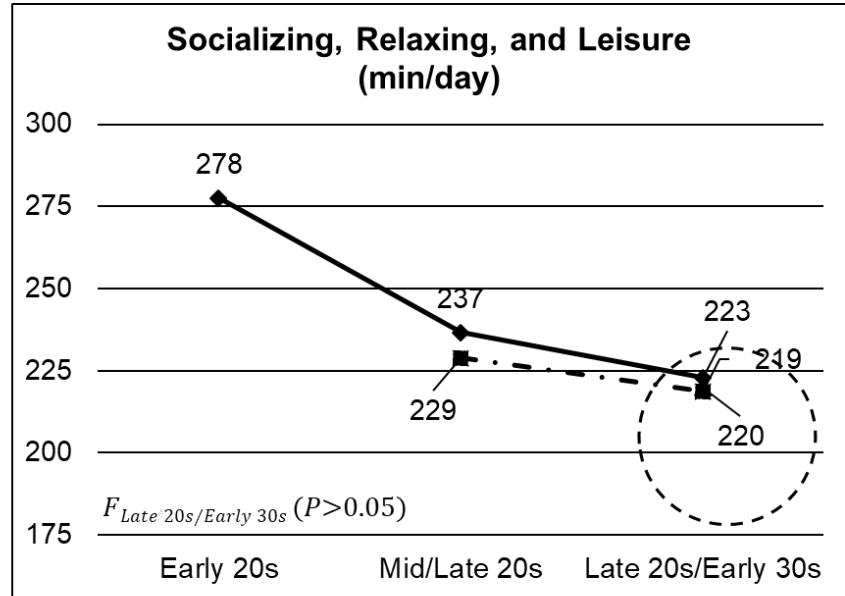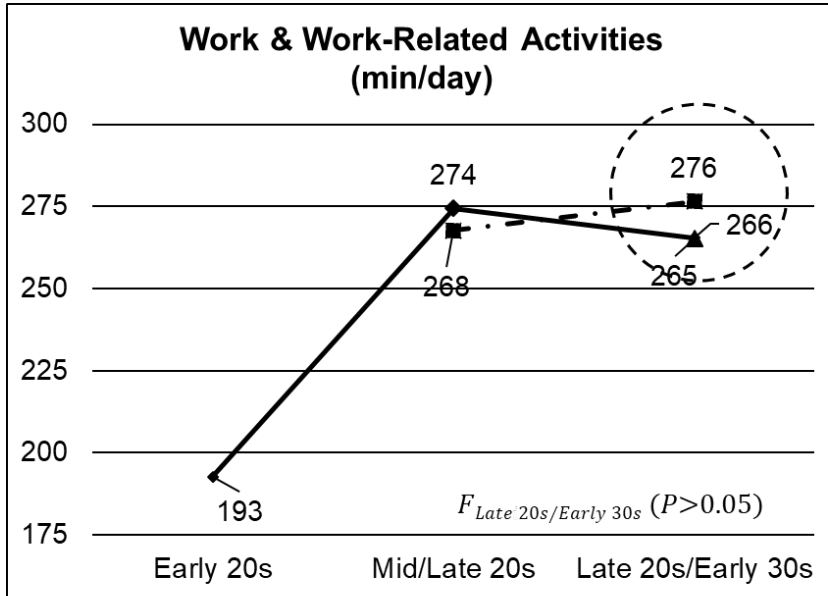
- Gen X and Older Millennials
- Younger and Older Millennials

Age Effect

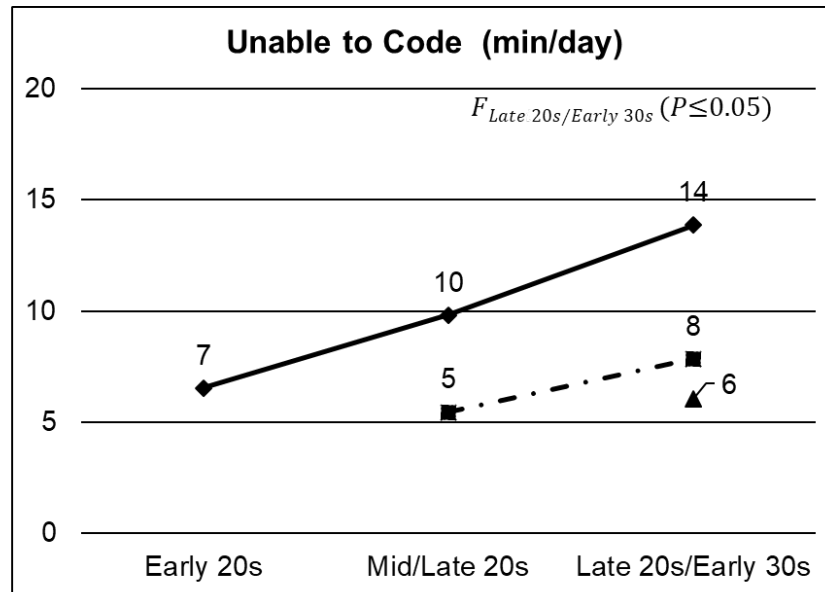**Objective: To study the evolution of time/mode use patterns for the same "cohort" as they age**
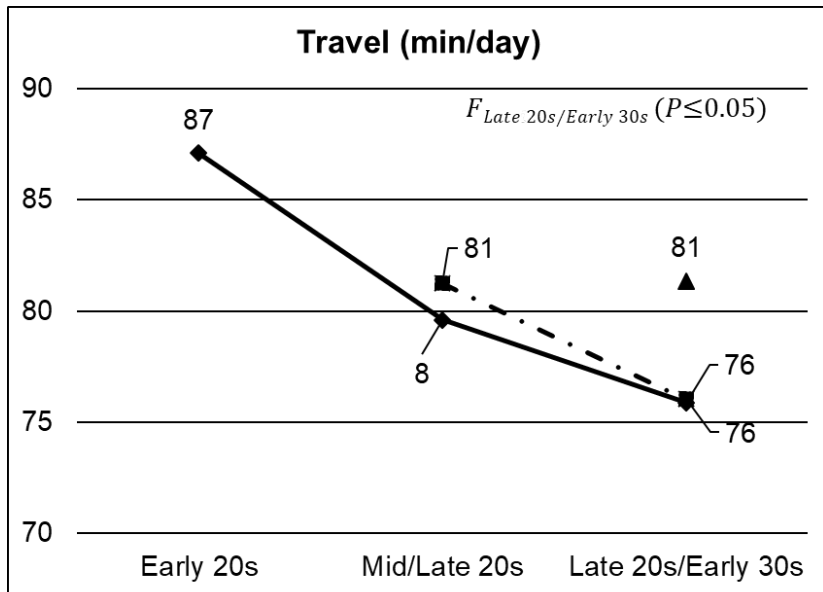
Born → Generation	Survey Year		
	2003-04	2007-08	2012-13
1979-85 → Millennial	18-24 (Early 20's)	22-28 (Mid/Late 20's)	27-33 (Late 20's/Early 30's)
1973-78 → GenX1	25-30 (Mid/Late 20's)	29-34 (Late 20's/Early 30's)	
1967-72 → GenX2	31-36 (Early 30's)	35-40	

Work vs. Leisure

Work & Work-Related Activities (min/day)

- 300
- 275 — 274
- 276
- 266
- 250 — 268 / 265
- 225
- 200
- 193
- 175

$F_{Late\ 20s/Early\ 30s}\ (P>0.05)$

Early 20s — Mid/Late 20s — Late 20s/Early 30s

Socializing, Relaxing, and Leisure (min/day)

- 300
- 278
- 275
- 237
- 250 — 223
- 219
- 225 — 229
- 220
- 200
- 175

$F_{Late\ 20s/Early\ 30s}\ (P>0.05)$

Early 20s — Mid/Late 20s — Late 20s/Early 30s

Millen: 1979-85 ■ · GenX1: 1973-78 ▲ GenX2: 1967-72

Travel and the Unknown

Travel (min/day)

$F_{Late\ 20s/Early\ 30s}\ (P \leq 0.05)$

90
85
80
75
70

87
81
81
8
76
76

Early 20s   Mid/Late 20s   Late 20s/Early 30s

Unable to Code (min/day)

$F_{Late\ 20s/Early\ 30s}\ (P \leq 0.05)$

20
15
10
5
0

7
10
14
5
8
6

Early 20s   Mid/Late 20s   Late 20s/Early 30s

— Millen: 1979-85   — ∙ GenX1: 1973-78   ▲ GenX2: 1967-72

The "Cohort" Effect

Objective: **To understand the 'cohort' effect while controlling for age**

1. Compare GenX (born 1970–1976) at ages 27–33 with older millennials (born 1979–1985) at ages 27–33

2. Compare older millennials (born 1979–1985) at ages 18–24 with younger millennials (born 1988–1994) at ages 18–24

Activity Time-Use Patterns for Different Cohorts at the Same Age
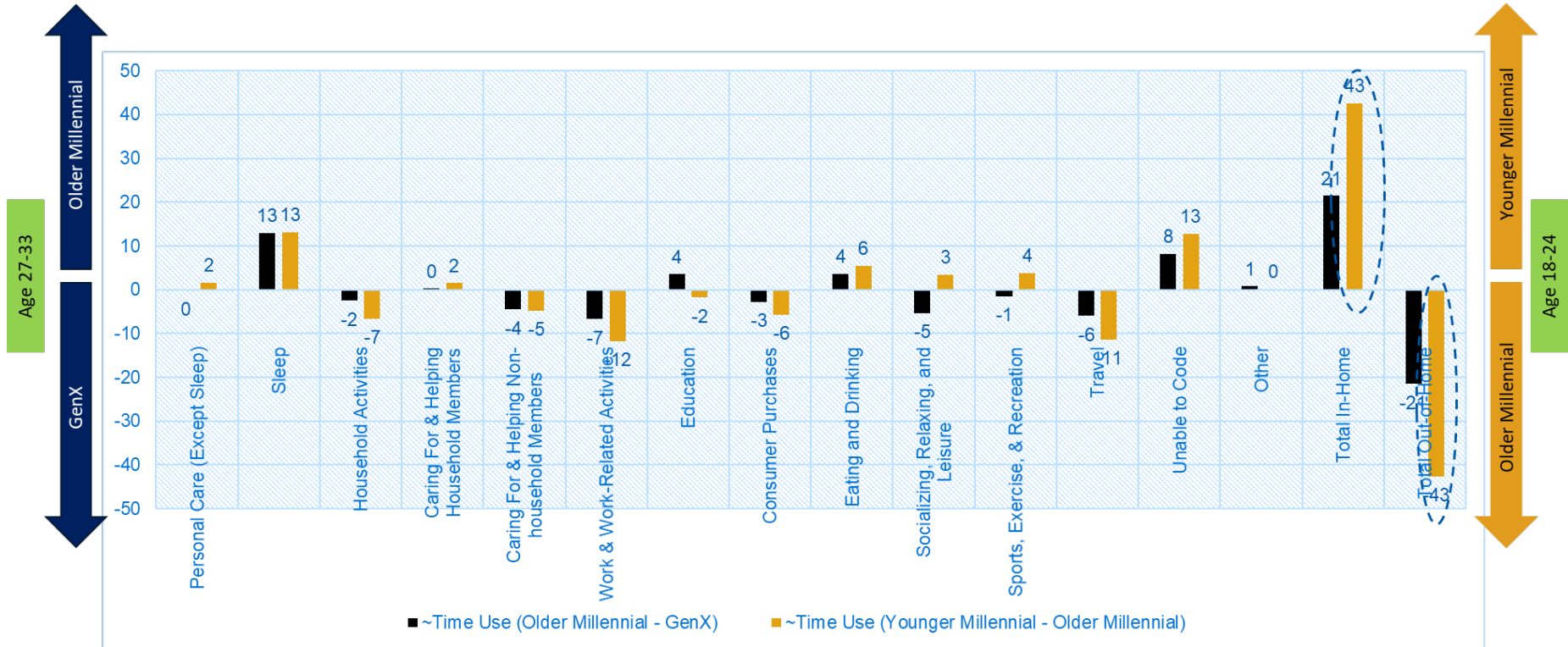
Younger vs. Older Millennials
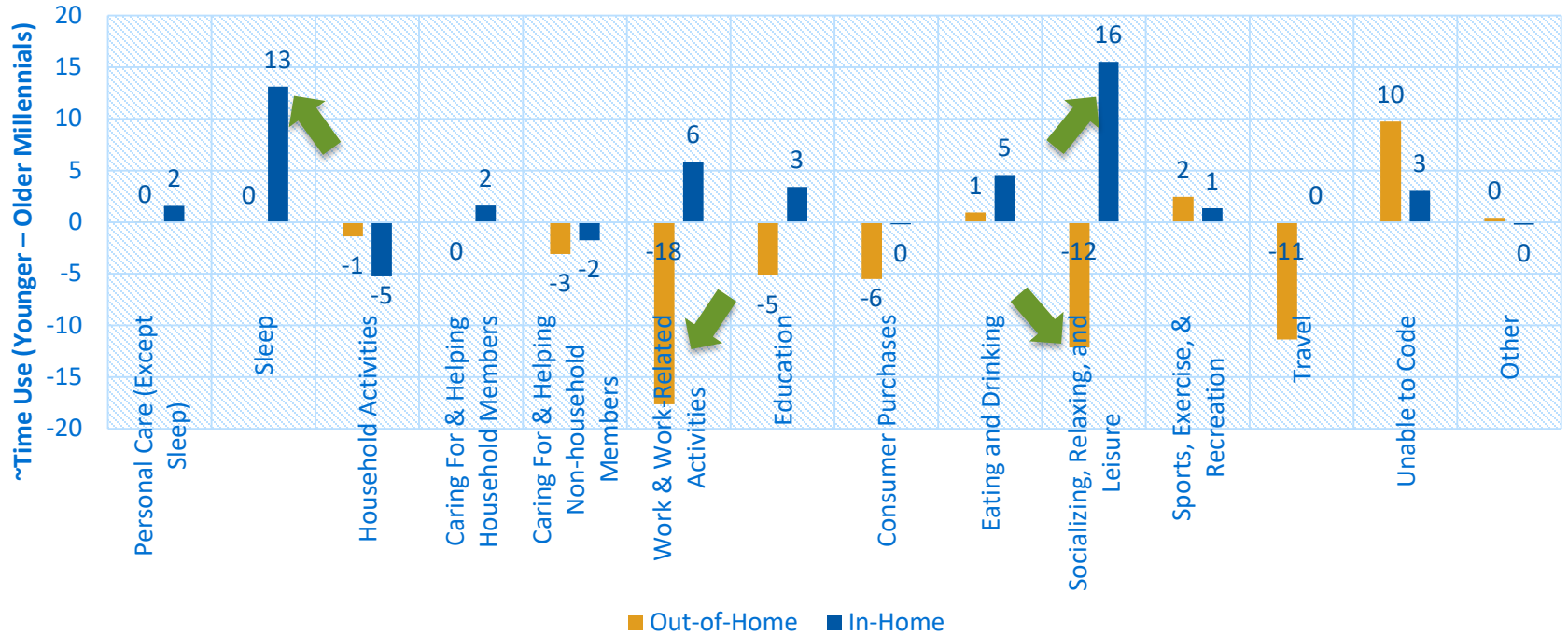
Conclusions

Millennial Hype Not Warranted
Transformative changes that millennials may bring about in society may not occur as portrayed in the media (convergence in time allocation patterns with younger GenX)

Lingering Residual Differences
But lingering differences remain, e.g., millennials at 27–33 years are similar — *but not exactly the same as* — GenX at 27–33 years

Differences within Millennial Generation
Younger millennials depict remarkably different patterns in *activity location* compared to older millennials (40 more minutes **at home** per day)

Lagged Demographic Phenomenon
Why the lingering differences? Likely due to lagged lifecycle events — home ownership, employment, marriage, children, etc.

Effects of ICT Unclear
ATUS not able to offer clear insights on Information and Communication Technologies (ICT) effects and multi-tasking;

Other Studies

The Multiple Dimensions of Activity
Participation: How Are the Choices Related?

Motivation

- Analysis of human activity and travel patterns is critical to forecasting travel demand

- Travel demand is characterized by a number of choice dimensions that define how, when, where, why, and with whom individuals travel

- Understanding the interrelationships between these different dimensions is critical to accurately depict activity-travel patterns

- Enhance spatial transferability of activity-travel models

- **Objective: Understanding the inter-relationships among four key dimensions of activity-travel demand**

Study Details

Uses ATUS data from 2013

Time of Day
(Multinomial Probit)

- Overnight (10:00 PM - 6:00 AM)
- AM Peak (6:01 AM - 9:00 AM)
- Mid-Morning (9:01 AM - 12:00 PM)
- Mid-Afternoon (12:01 PM - 4:00 PM)
- PM Peak (4:01 PM - 7:00 PM)
- Late Evening/Night (7:01 PM - 10:00 PM)

Location
(Binary Logit)

- In Home
- Out of Home

Party Composition
(Multinomial Probit)

- Alone
- Only with Household Member(s)
- Only with Non-Household Member(s)
- With Both Household and Non-Household Members

Duration
(Continuous)

0–1439

Activity Types

Caring for and helping other people (household as well as non-household members)

Work and work-related activities

Education
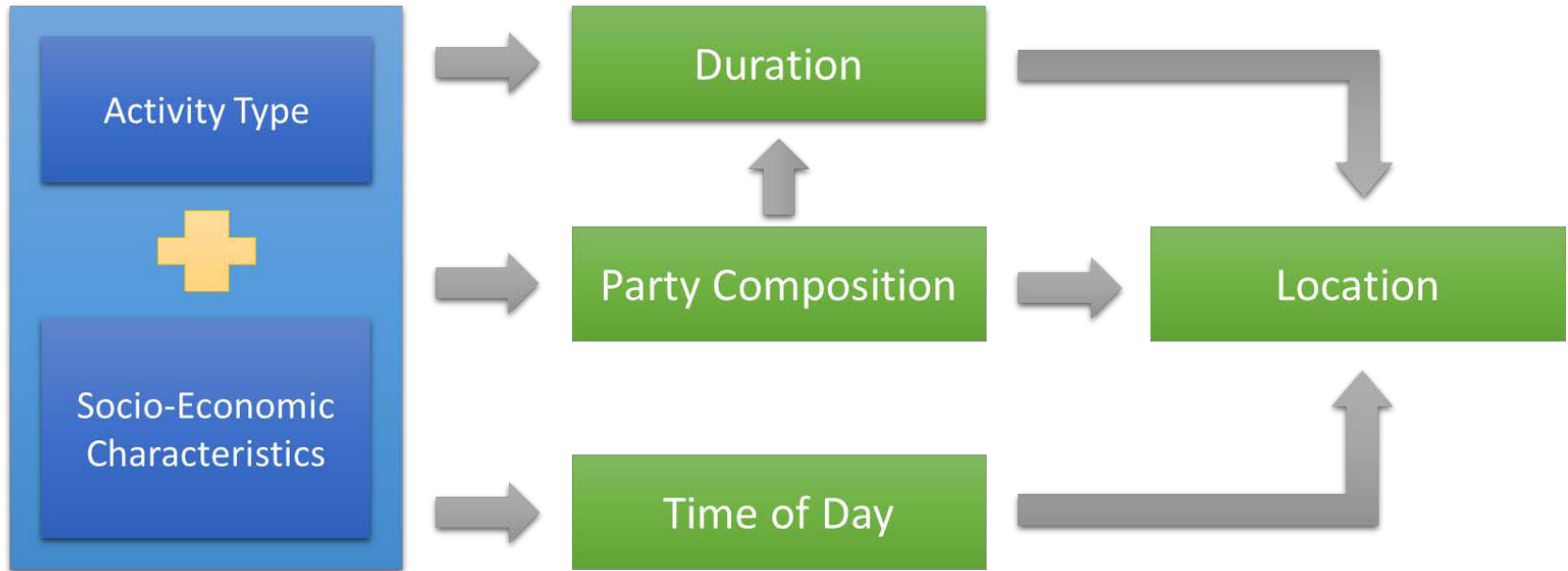
Eating and drinking
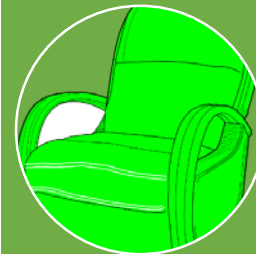
Socializing, relaxing, and leisure

Sports, exercise, and recreation

Choice Structure

Commuter Sample (20,960 activities by ~5,000 commuters)

Other Studies

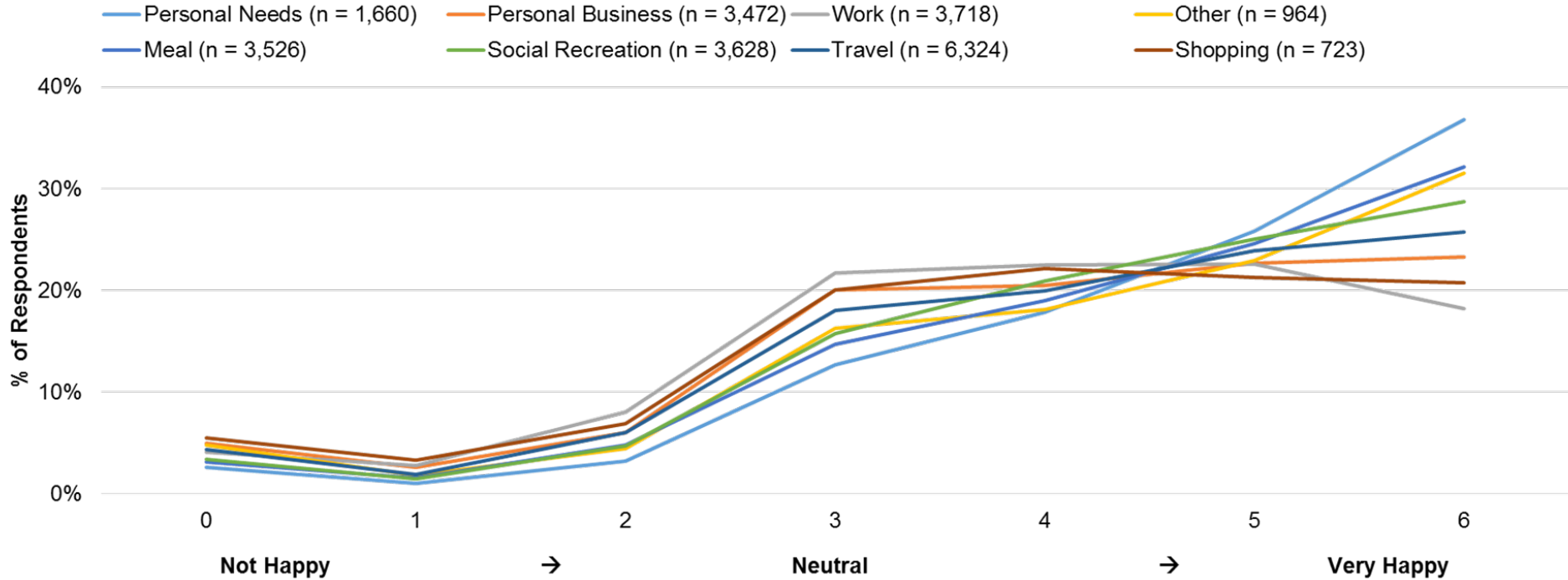Interaction between Activity-Travel Engagement and Subjective Well-Being

Motivation

- Variables usually included in activity travel-demand models

    - Socio-demographic characteristics

    - Zonal attributes

    - Level-of-service measures

- Lifestyle preferences and attitudinal/perception variables are missing

- Activity time-use pattern → well-being, but also possible that well-being → activity time-use pattern

- No existing operational framework to reflect the possible two-way relationship
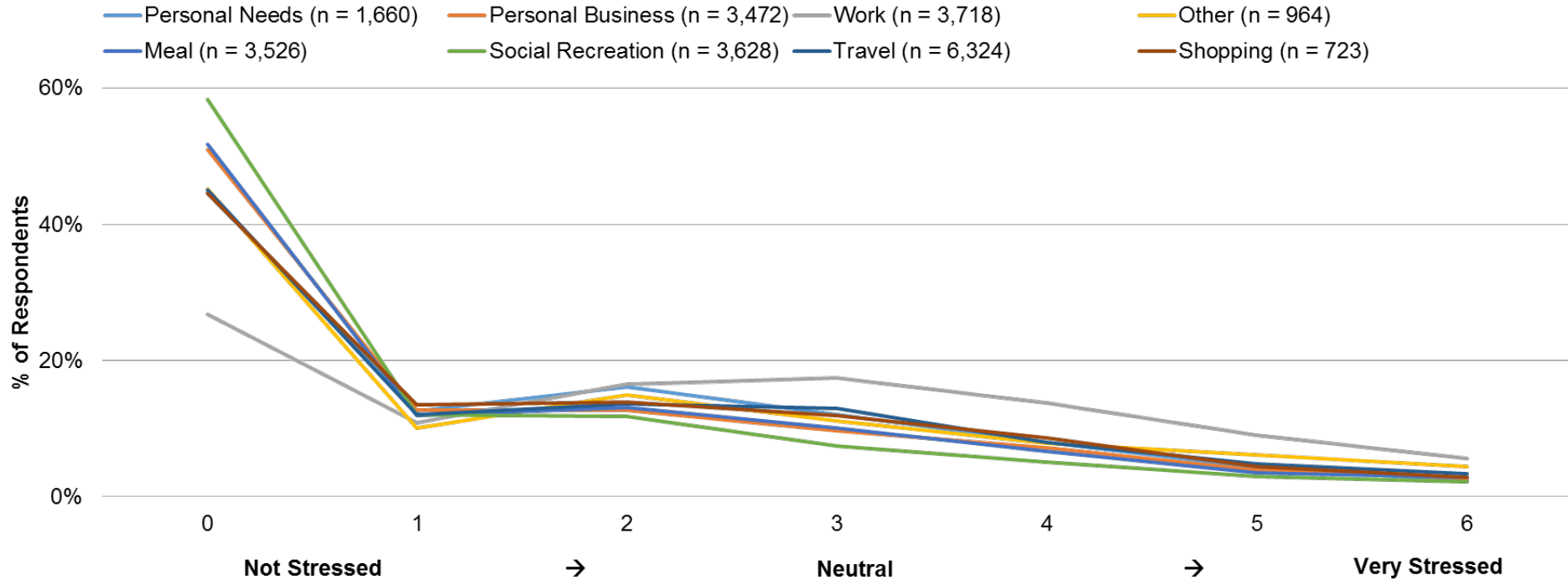
Data

- Data from the ATUS Well-Being Module

- Well-Being Module available for years 2010, 2012, and 2013

- Respondents rate well-being for three randomly selected activities

Happy	• 0 → Not happy at all • 6 → Very happy

Sad	• 0 → Not sad at all • 6 → Very sad

Meaningful	• 0 → Not meaningful at all • 6 → Very meaningful

Stressed	• 0 → Not stressed at all • 6 → Very stressed

Painful	• 0 → Not painful at all • 6 → Very painful

Tired	• 0 → Not tired at all • 6 → Very tired

Well-Being Scores (Happy)

Well-Being Scores (Stressed)

Thank you

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