THE UNIVERSITY OF RHODE ISLAND
DEPARTMENT OF PSYCHOLOGY

Identifying Longitudinal Patterns of Adherence to Treatment for Obstructive Sleep Apnea

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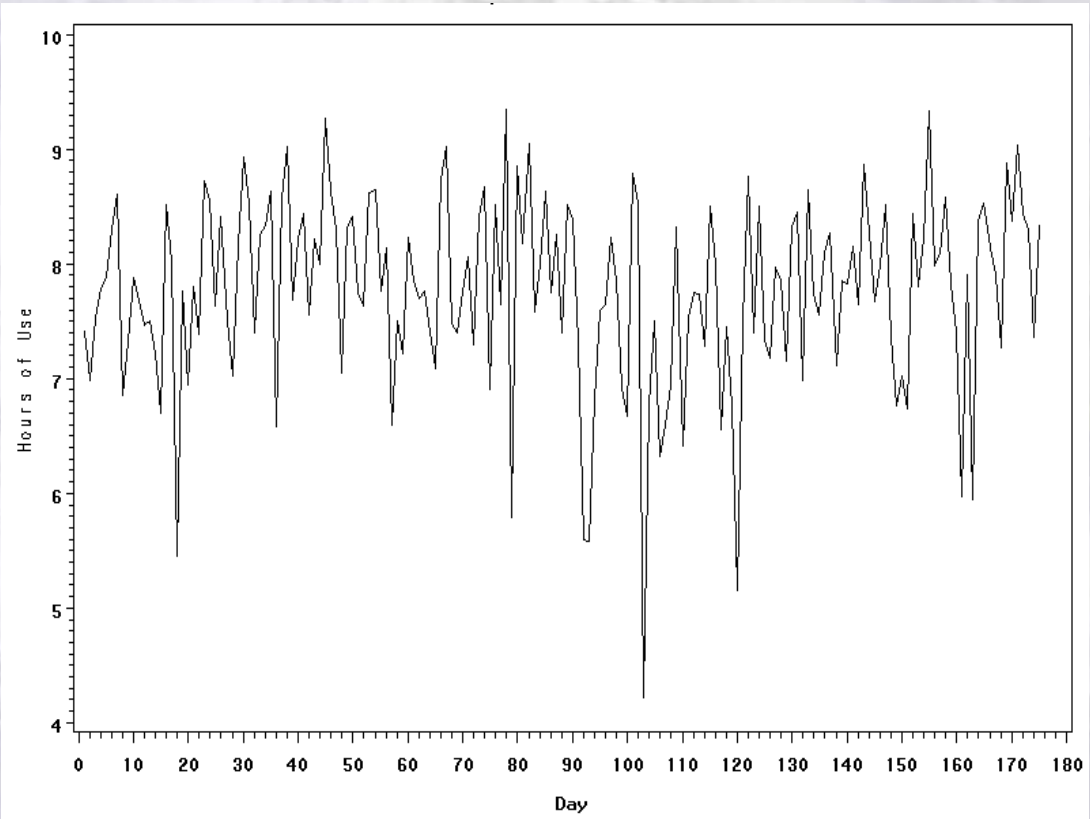
Part I: Introduction



Background

- Adherence to medical recommendations
  - o Reduce preventable mortality, improve outcomes, save health care money
  - o Sleep disorders have the poorest rates - around 65%

Background (continued)

- Obstructive sleep apnea
  - o At least 2-4% of middle-aged adults
  - o More prevalent in men
  - o Repeated cessations of breathing
  - o Daytime sleepiness, decreased cognitive performance, irritability, depression
  - o Higher rates of mortality: hypertension, other cardiovascular disease
  - o Poor adherence

Background (continued)

- Positive airway pressure (PAP)
  - o The standard treatment
  - o PAP device
  - o Daily use data

Background (continued)

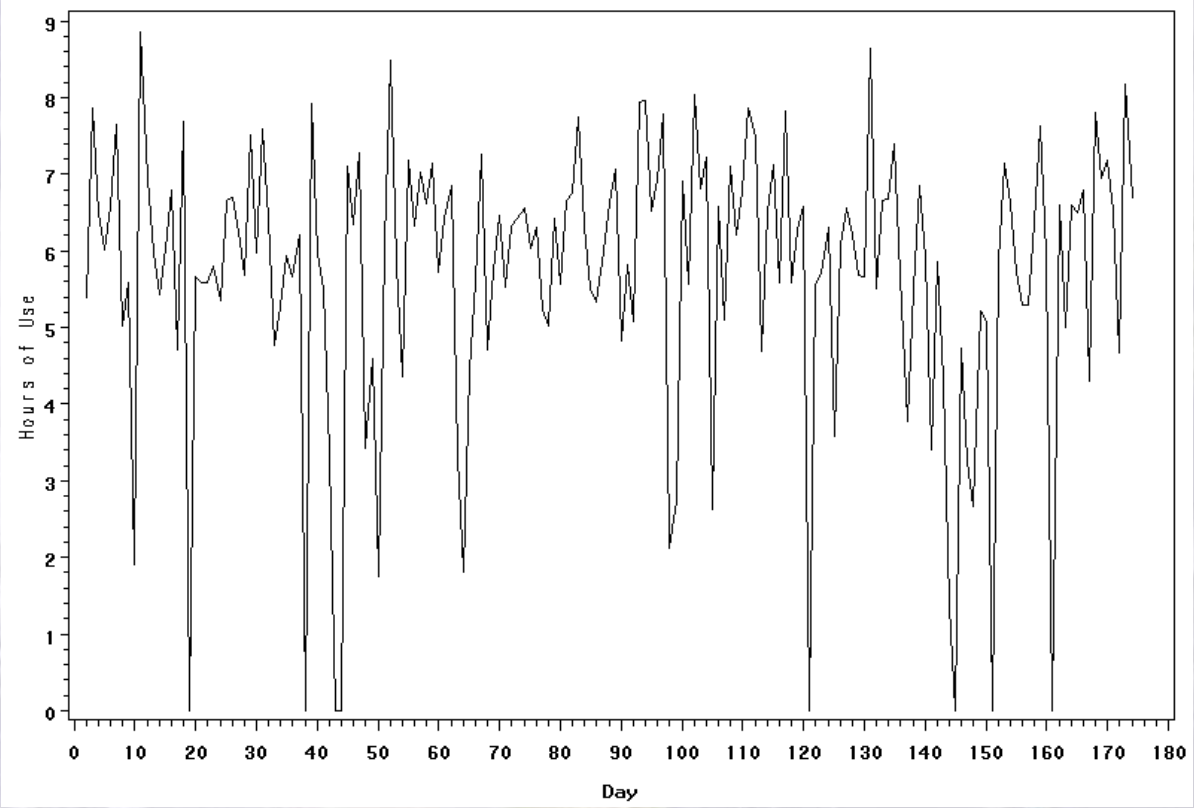
How do we analyze adherence behavior?

- Group-level
  - o Nomothetic
  - o Many individuals
  - o Small number of occasions
  - o Inter-individual variability
- Individual-level
  - o Idiographic
  - o One individual
  - o Large number of occasions
  - o Intra-individual variability

The present study

- Secondary data analysis
- Address the issue of poor adherence with individual-level and group-level approaches
  - 1) Time series analysis
  - 2) Dynamic cluster analysis
  - 3) Group comparisons with variables associated with adherence

Part II: Methods and Results



Participants

- 161 patients diagnosed with OSA
- Five different sleep centers
  - CA, FL, CT, AL, Berlin
- 72.7% male
- Age: 21-75, mean age = 48.9
- Approx. 180 days of data per participant

Measures

- Hours per night
  - Connected to machine, pressure being administered
- Demographics
  - Age, height, weight, BMI, blood pressure, heart rate, education, ethnicity
- Sleep apnea variables
  - AHI, PAP pressure, ESS, FOSQ, PVT
- Psychosocial variables
  - ATUQ, VAS (perceived sleep quality, satisfaction comfort, benefit)

Time Series Analysis

- Idiographic method: separate analysis for each participant
- Nightly use
- Mean of the series, level, slope, autocorrelation, variance

Time Series Analysis: Results

- Heterogeneity of individuals
  - Mean, level, slope, autocorrelation, and variance
- Slope
  - Significant for 46.6% of the sample
    - 25.3% positive
    - 74.7% negative
- Autocorrelation
  - For most, very small

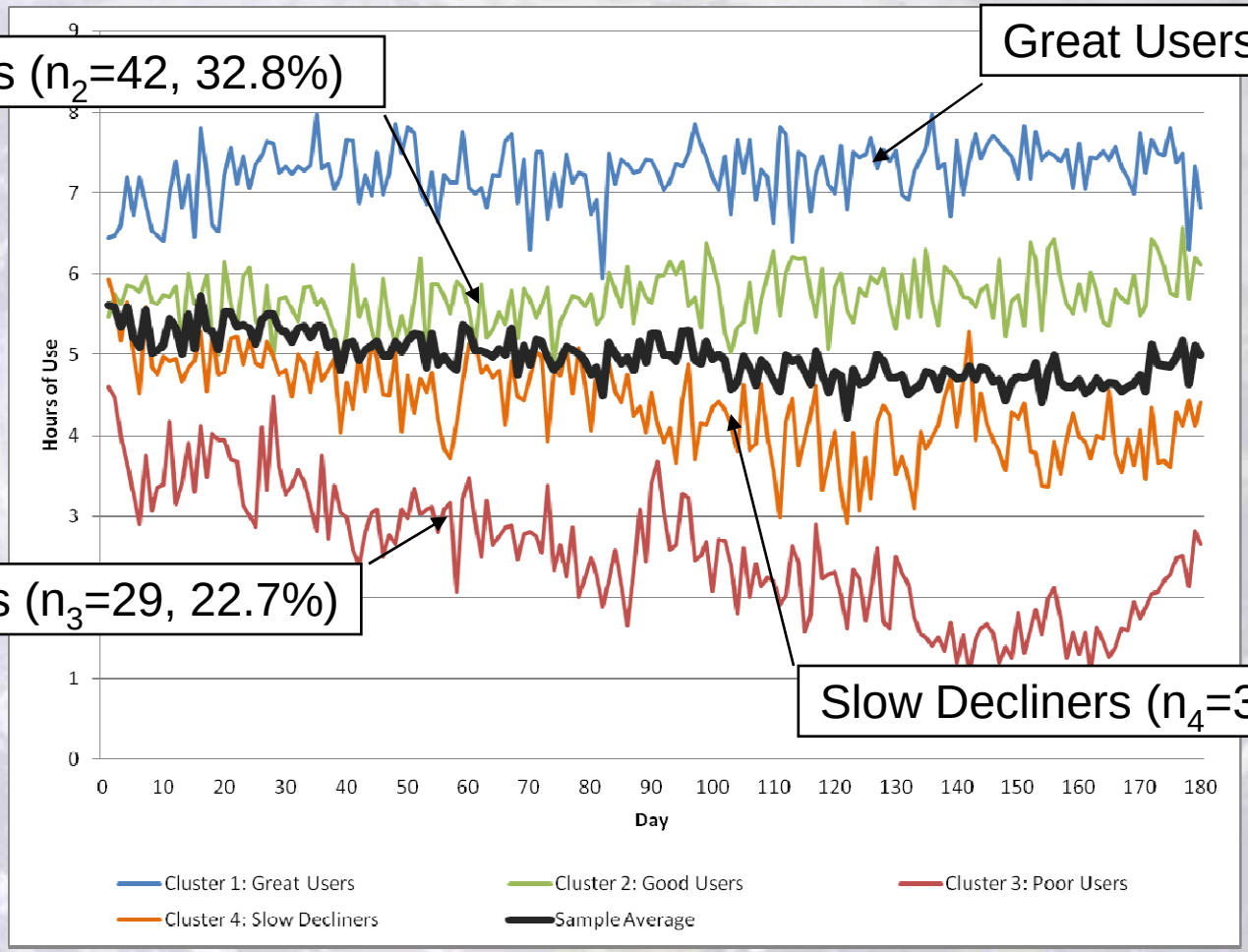
Dynamic Cluster Analysis

- Cluster analysis groups multiple variables on a single occasion
- Dynamic cluster analysis groups a single variable across multiple time points
  - 180 days = 180 variables for clustering

Dynamic Cluster Analysis: Results

Good Users (n_2=42, 32.8%)

Great Users: n_1=22, 17.2%



Poor Users (n_3=29, 22.7%)

Slow Decliners (n_4=35, 27.3%)

Group Comparisons

- Establish external validity of the clusters
- Demographic variables, sleep apnea variables, psychosocial variables
- Baseline, 30, 90, 180 days
- ANOVAs and chi-square tests

Group Comparisons: Results

- Mostly non-significant, small effect sizes
- Evidence for external validity

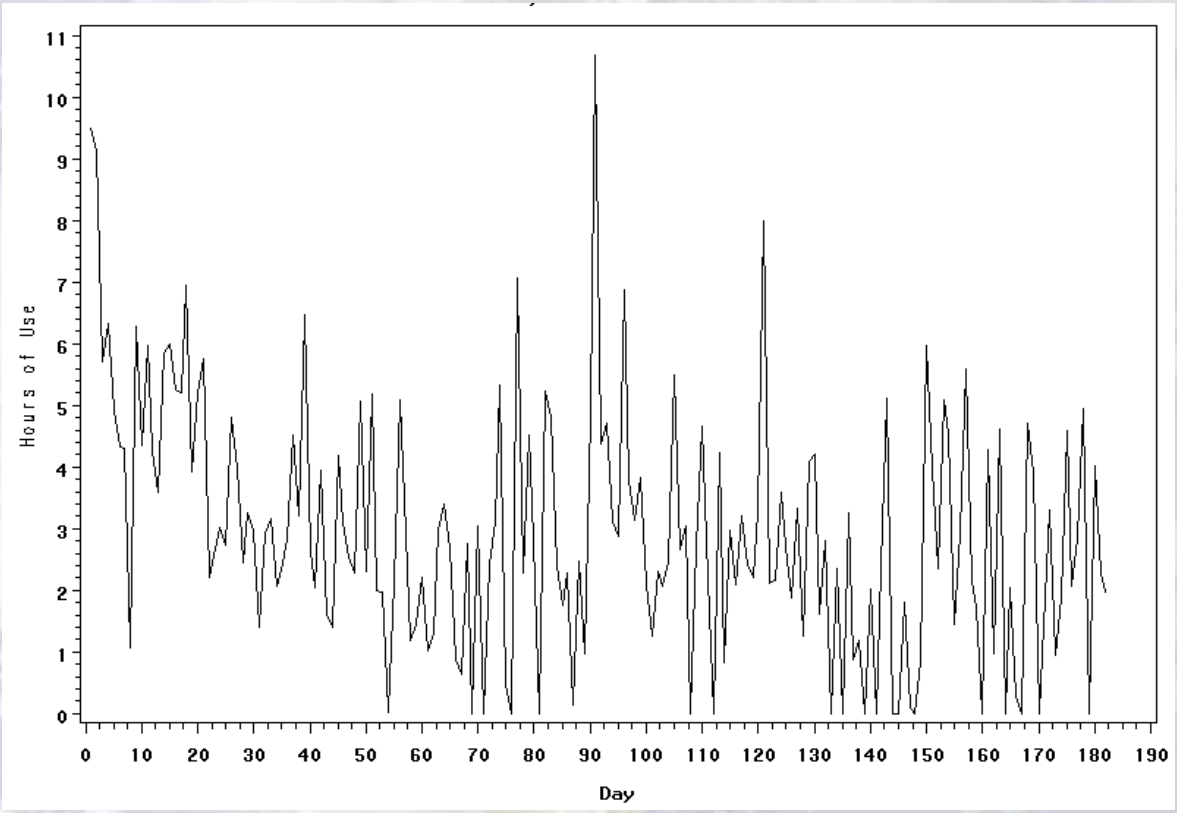
Notable comparisons

- Ethnicity
  - Not equally distributed, large effect at baseline
  - Participants that were black or African American more likely to be in the Poor Users Group
- ESS (sleepiness)
  - Significant differences, medium effect at day 90, medium effect at day 180
  - Poor Users reported the most sleepiness
- ATU-A (self-efficacy)
  - Significant differences, medium effect at day 90, large effect at day 180
    - Largest effect size of any of the variables
  - Great Users reported the most self-efficacy

Comments on comparisons

- Ethnicity
  - 79% of the sample was white, only 11% of sample was black
  - May be related to sleep center
- Self-efficacy
  - Intervention?

Part III: Discussion



Dynamic Typology

- Time series analysis and dynamic cluster analysis
- Allows for the consideration of subgroups in the data while still respecting individual differences

Take-home messages

- Individual-level differences are important for complex behaviors such as adherence
- Similar individual patterns over time can be grouped together
- External variables can be used to explore differences among these groups

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Reference

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Thanks!