Changes in Objectively-Measured Physical Activity and Sedentary Behavior among School-Age Children during COVID-19

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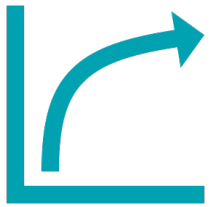
Background

- Regular physical activity is important for energy-balance in children.
- COVID-19 affected how people live, work, study, travel, and play.
- Previous evidence on physical activity during COVID-19:
  - Cross-sectional studies
  - Self-report measures
  - Outside of US

Yang S, Guo B, Ao L, Yang C, Zhang L, Zhou J, et al. Obesity and activity patterns before and during COVID-19 lockdown among youths in China. Clinical Obesity. 2020;10(6):e12416.
Yomoda K, Kurita S. Influence of social distancing during the COVID-19 pandemic on physical activity in children: A scoping review of the literature. Journal of Exercise Science & Fitness. 2021.
Okely AD, Kariippanon KE, Guan H, Taylor EK, Suesse T, Cross PL, et al. Global effect of COVID-19 pandemic on physical activity, sedentary behaviour and sleep among 3-to 5-year-old children: a longitudinal study of 14 countries. BMC Public Health. 2021;21(1):1-15.
Burkart S, Parker H, Weaver RG, Beets MW, Jones A, Adams EL, et al. Impact of the COVID-19 pandemic on elementary schoolers' physical activity, sleep, screen time and diet: A quasi-experimental interrupted time series study. Pediatric Obesity. 2022;17(1):e12846.

Study Aims



To identify change trajectories of device-measured physical activity and sedentary time from pre-COVID-19 to during COVID-19 in school-aged children in the US.

To examine the socio-ecological factors associated with changes in movement behaviors.

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Methods

- Part of STREETS 5-year natural experiment
- Cohort of school-age children (age 8-11)
- Measured at 2 time points:
  - **Time 1:** Sept 2019 – Feb 2020
  - **Time 2:** Oct 2020 – March 2021

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Methods

Movement behaviors from GT3X accelerometers using Evenson cutpoints for children:

- Mean daily minutes of moderate-to-vigorous physical activity (MVPA)
- Mean daily hours sedentary behavior

Socio-ecological predictors:

- Individual, family, social and organizational, and neighborhood

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Socio-Ecological Factors

Individual

- Age
- Gender
- Race/ethnicity

Family

- Parental education attainment (binary: HS or less vs. above HS)
- Number of children in household
- Independent mobility (binary: allowed to walk or play without adult vs. not allowed)

Social and Organizational

- School attendance during COVID (binary: in-person vs. virtual)
- Informal social control (5 item scale)
- Social cohesion (5 item scale)
- Perceptions of crime and traffic (2 items, dichotomized: low vs. high)

Neighborhood built environment

- Sidewalk availability (dichotomized: low vs. high)
- Crosswalk availability (dichotomized: low vs. high)

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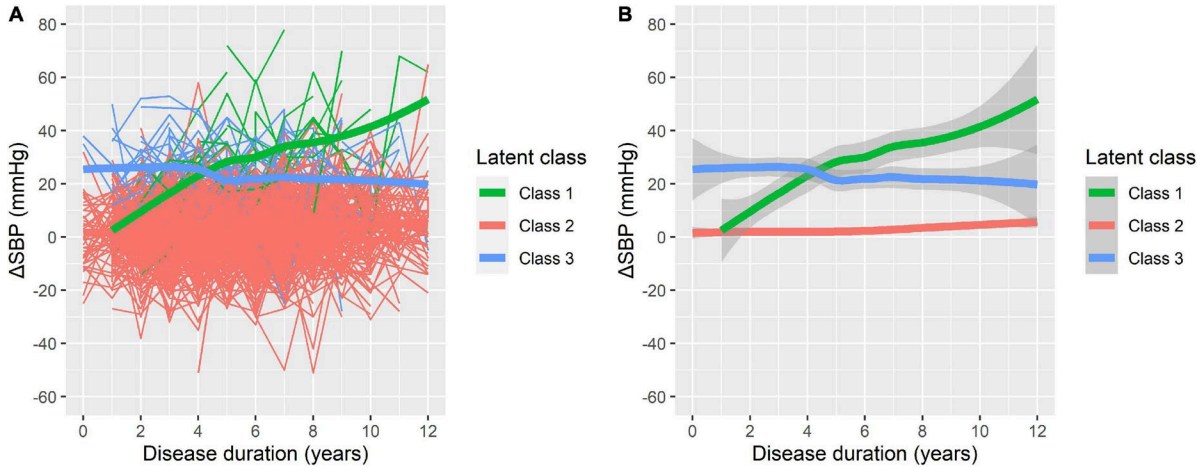
Methods

- Descriptive statistics
- Latent class linear mixed models
  - Used to identify change trajectories of MVPA and sedentary time in separate models
- Logistic regression models
  - Used to examine association between socio-ecological factors and membership in trajectory groups for each movement behavior



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Sample Characteristics

168 Number of participants with valid physical activity at both timepoints

56% female
44% male

9 Average age at baseline in years

44% White, Non-Hispanic
39% Hispanic or Latinx
10% Asian or Other
7% Black or African American

29% with parents who have high school education or less

54% virtual school attendance during COVID

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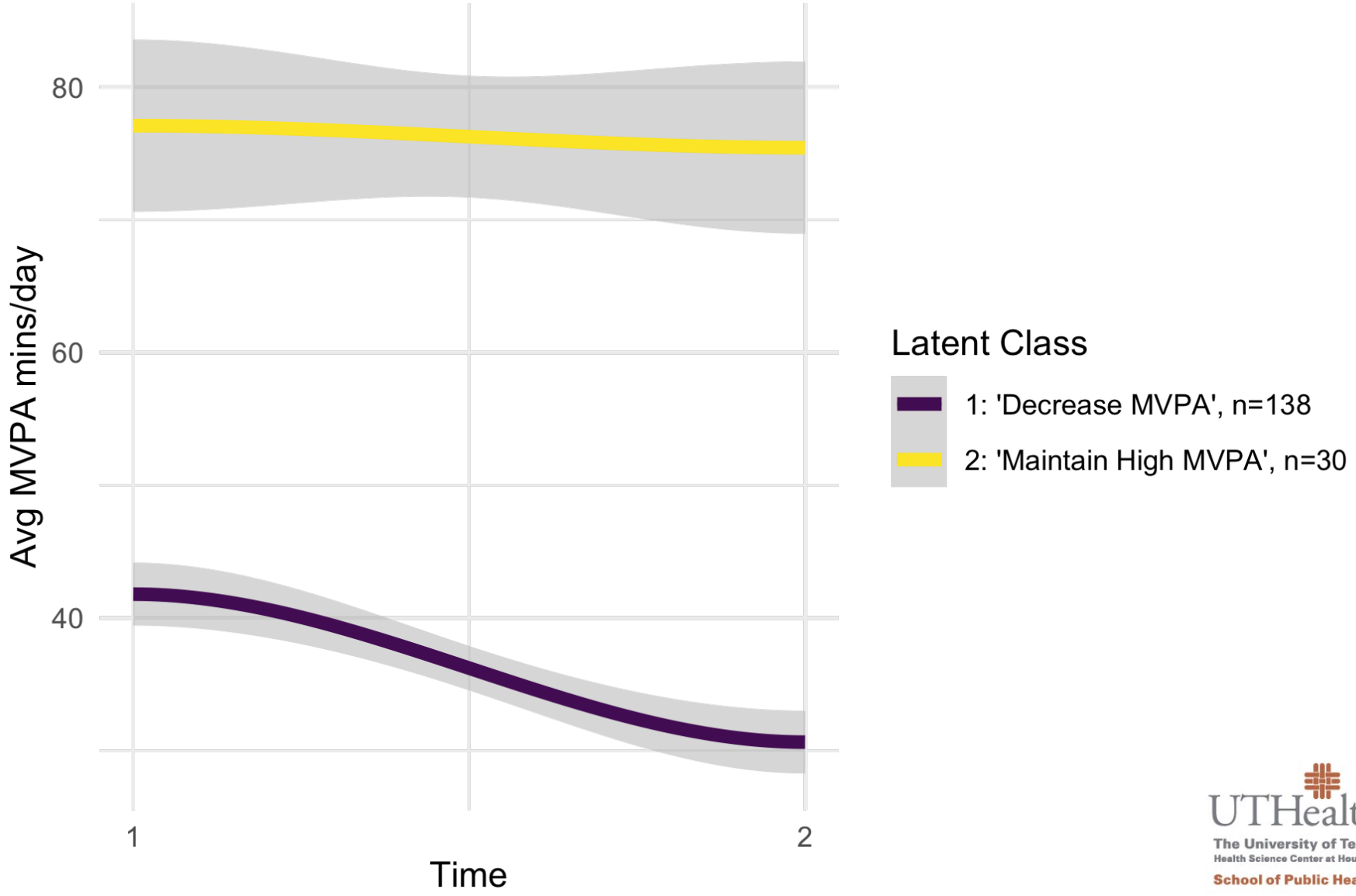
Physical Activity Trajectories



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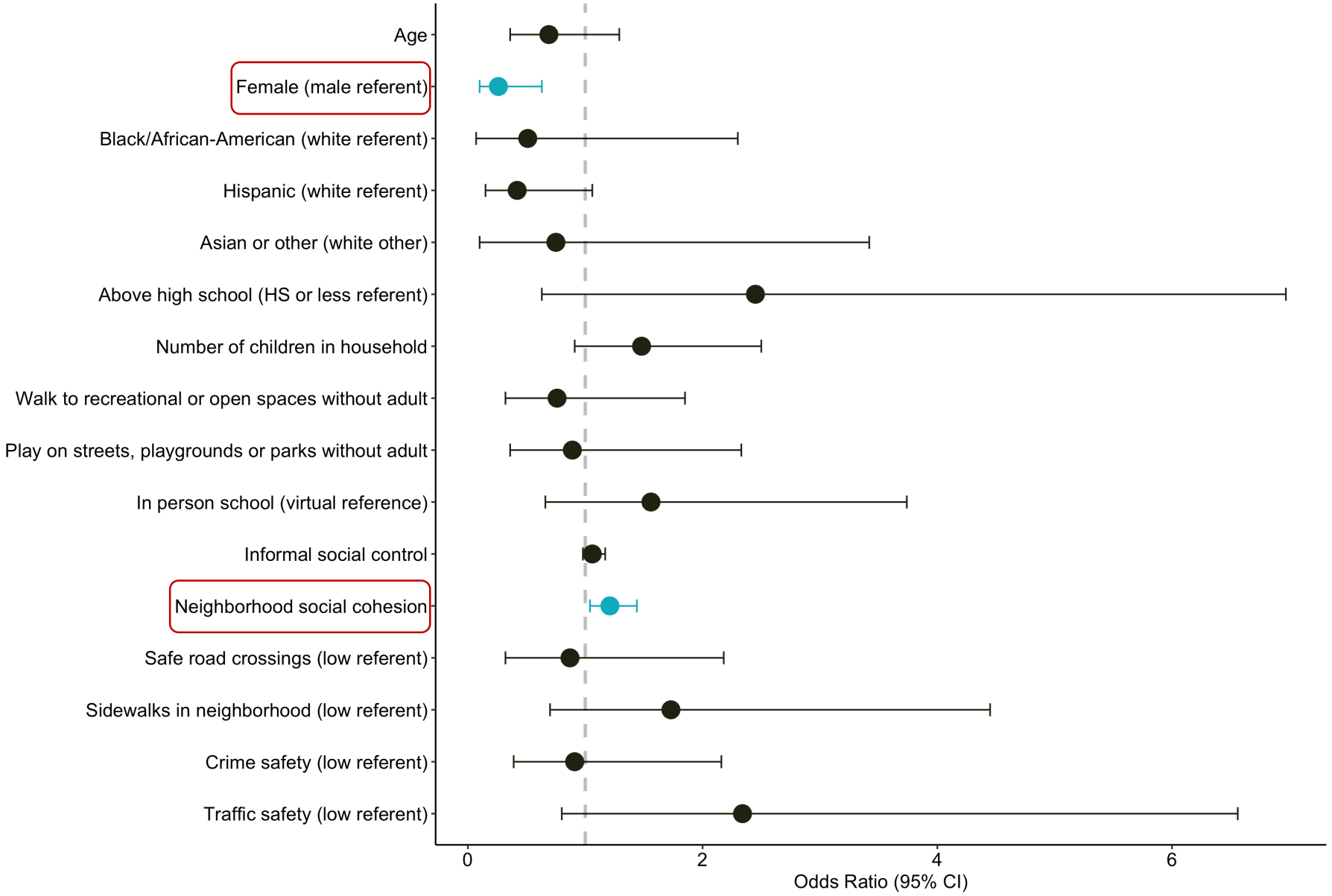
Odds of being in the ‘Maintain High MVPA’ group



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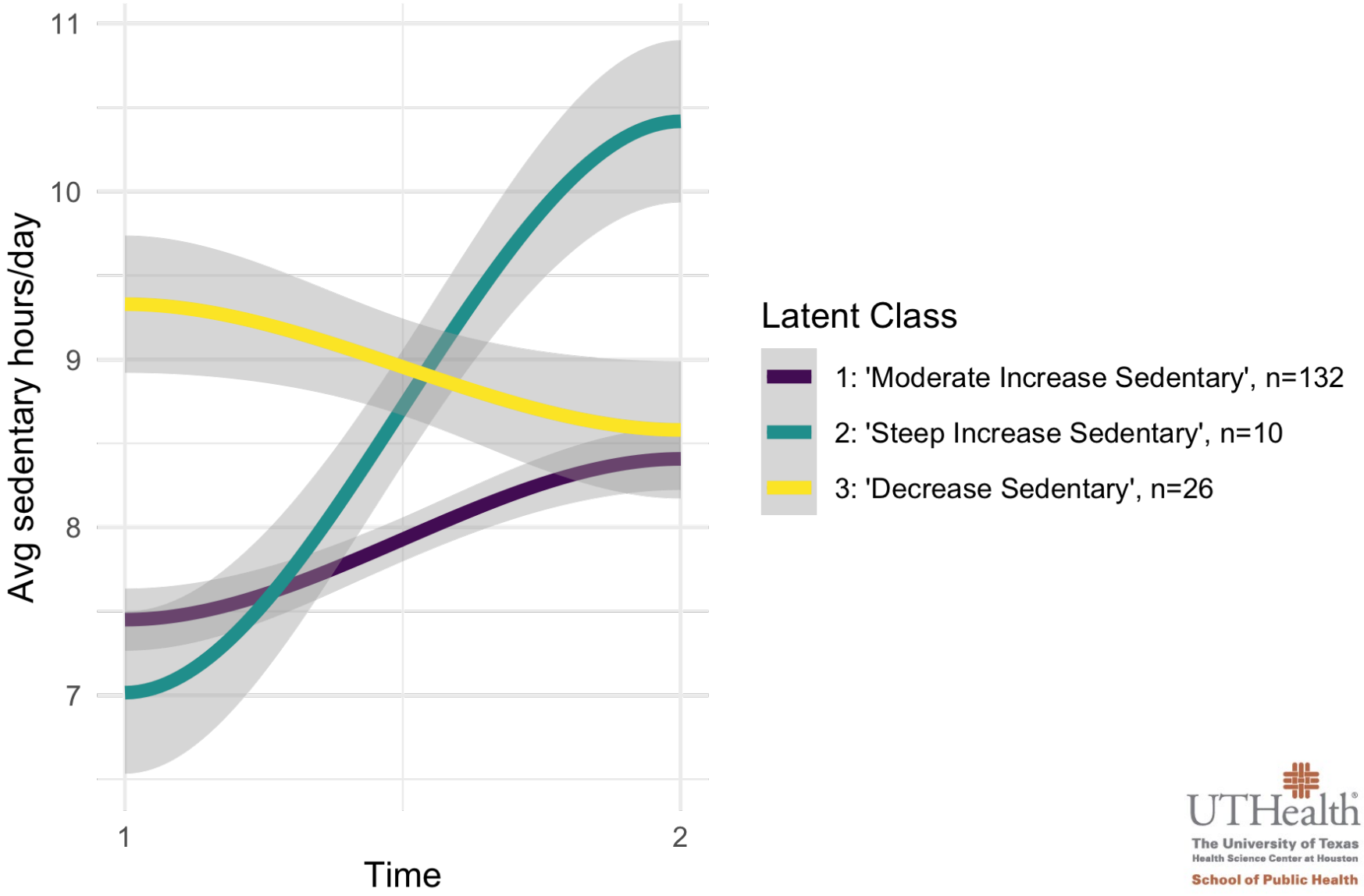
Sedentary Behavior Trajectories



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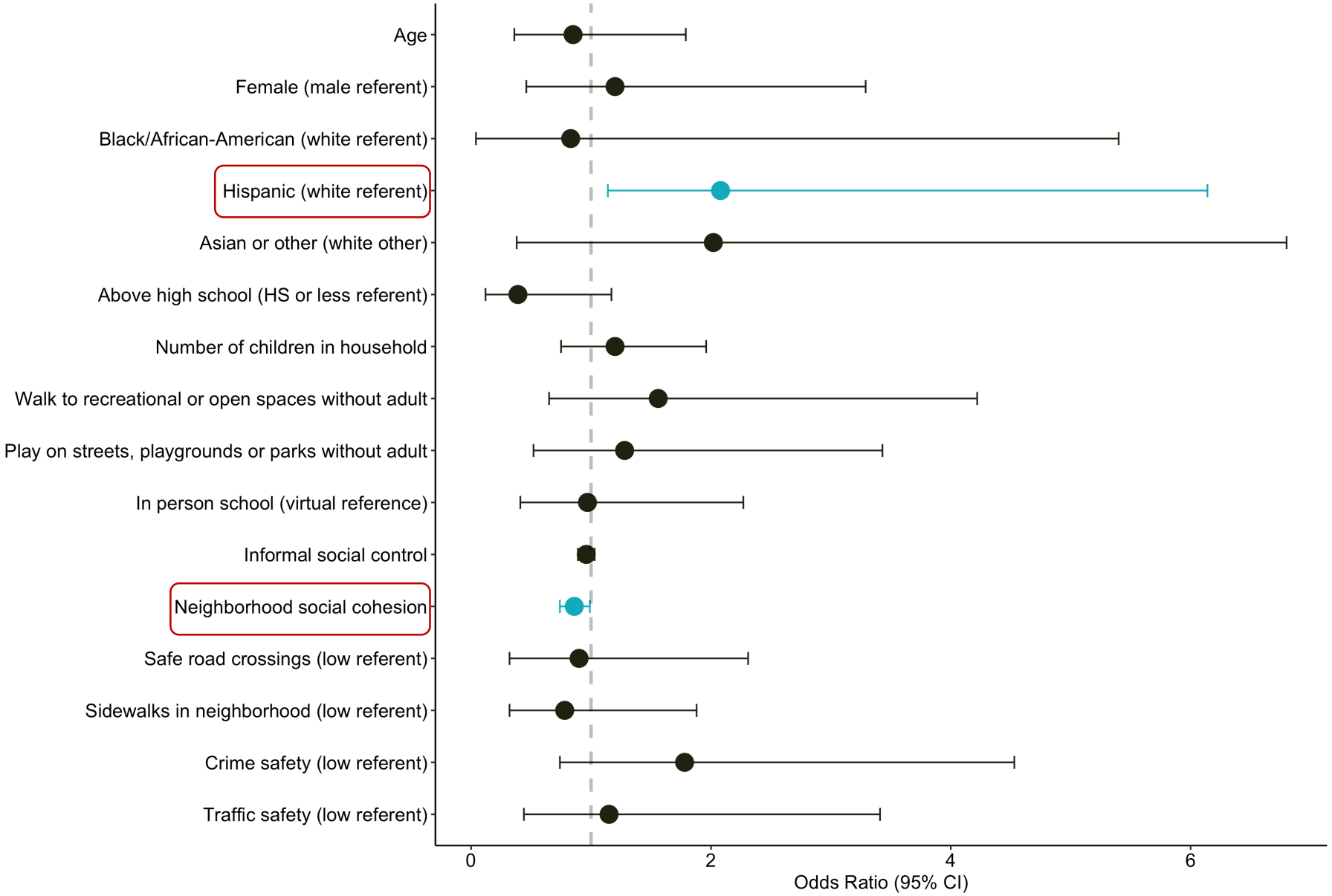
Odds of being in the ‘Decrease Sedentary’ group



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Discussion

Significant declines in physical activity and increases in sedentary behavior

Girls were less likely to maintain physical activity

Hispanic children more likely to decrease sedentary behavior

Importance of social cohesion

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Thank you!

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