Longitudinal Changes in Objectively-Measured Physical Activity and Sedentary Time among School-Age Children in Central Texas, US during the COVID-19 Pandemic

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INTRODUCTION

- 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

AIMS

1. 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
2. To examine the socio-ecological factors associated with changes in movement behaviors.

METHODS

- **Design:**
  - Part of STREETS 5-year natural experiment
  - Longitudinal study design with two time points:
    - **Time 1:** Sept 2019-Feb 2020 (Pre-COVID-19)
    - **Time 2:** October 2020-March 2021 (During COVID-19)
- **Population Sample:** Cohort of school-age children (ages 8-11)
- **Measures:**
  - GT3X accelerometers using Evenson cut points to measure primary outcomes of:
    - Mean daily minutes of moderate-to-vigorous physical activity (MVPA)
    - Mean daily hours sedentary time
  - Socio-ecological predictors: individual, family, social, organizational, neighborhood
- **Data analysis methods**
  - Descriptive statistics
  - Latent class linear mixed models (Aim 1)
  - Logistic regression models (Aim 2)

RESULTS

168 Number of participants with valid physical activity at both timepoints

56% female
44% male

9 Average age at baseline in years

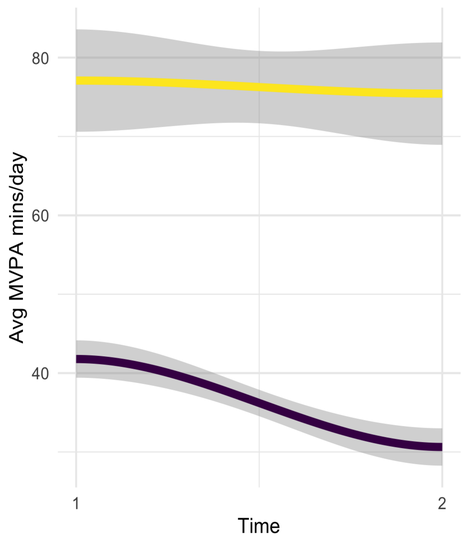
44% White, Non-Hispanic
39% Hispanic or Latinx
10% Asian or Other
7% Black or African American

29% with parents who have high school education or less

54% virtual school attendance during COVID

Scan for more results!

Figure 1. Physical Activity Trajectories

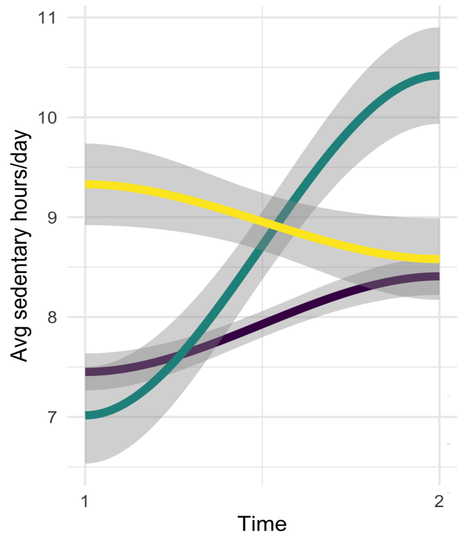


Important factors:
- Gender: girls less likely to maintain MVPA
- Social cohesion: higher cohesion more likely to maintain MVPA

Average daily MVPA changes:
- Decrease MVPA group: -11.10 minutes
- Maintain High MVPA: -1.66 minutes

Latent Class
1: 'Decrease MVPA', n=138
2: 'Maintain High MVPA', n=30

Figure 2. Sedentary Behavior Trajectories



Important factors:
- Race/ethnicity: Hispanic children more likely to decrease ST
- Social cohesion: higher cohesion less likely to decrease ST

Average daily ST changes:
- Moderate increase ST: 0.95 hours
- Steep increase ST: 3.40 hours
- Decrease ST: -0.75 hours

Latent Class
1: 'Moderate Increase Sedentary', n=132
2: 'Steep Increase Sedentary', n=10
3: 'Decrease Sedentary', n=26

CONCLUSIONS & NEXT STEPS

- Significant declines in physical activity and increases in sedentary time during the COVID-19 pandemic when compared to pre-COVID-19 time period.
- The majority of children in this study were categorized in the 'decreasing MVPA' and 'increasing sedentary time' groups.
- Previous evidence yearly relative change in minutes of daily MVPA from age 3 to 18 was −3.4%. We found a mean yearly relative change in minutes of daily MVPA of -17.0%.

Limitations
- Small sample size
- Maturation bias
- Determinants of movement behaviors not measured

Future research
Despite these limitations, this study demonstrates the need to counteract short-term negative changes to children's movement behaviors in the face of societal level disruptors.

ACKNOWLEDGEMENTS & REFERENCES

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