

School Policies and Active Commuting among Elementary Students: A Dose Response Association

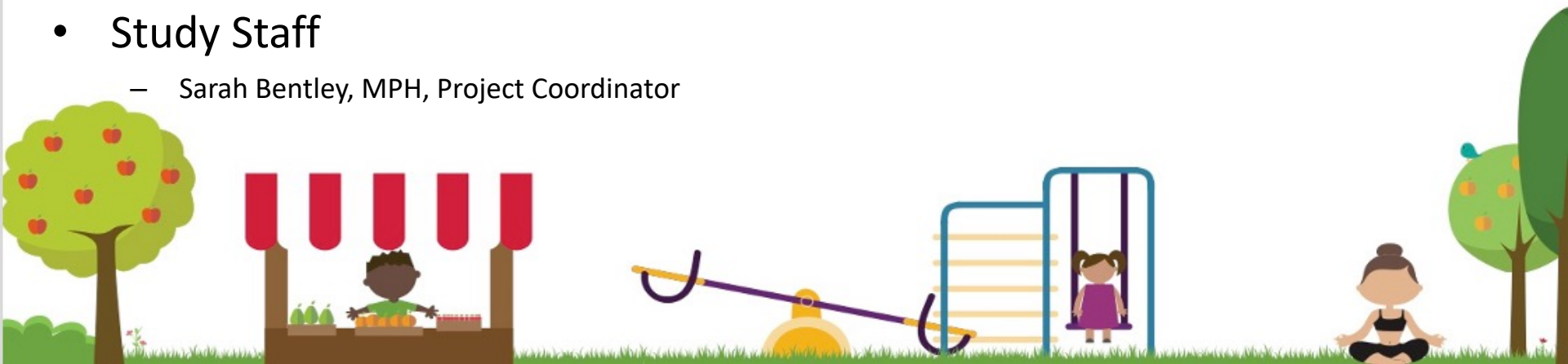
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 - Bill Kohl, PhD
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 - Adriana Perez, PhD
 - Shelton Brown, PhD
 - Deborah Salvo-Dominguez, PhD
- Study Staff
 - Sarah Bentley, MPH, Project Coordinator



Background

- Benefits of active commuting to school (ACS)
 - ↑ physical activity
 - ↑ cardiovascular fitness
 - ↑ mental well-being
- In 2017, 9.6% of students 5–17 years old usually walked and 1.1% biked to school.
 - Elementary school students
 - 10.0% walk
 - 0.9% bike

Background

- Correlates of ACS
 - Previous literature has focused on individual, social, & environmental
 - School as setting for policy-related health promotion strategies to increase ACS (Safe Routes to School programs)
 - Most study implementation of only one program or policy
- Programs and policies do not exist in isolation within schools



Study Purpose



To examine the association between the number of school policies and practices for active commuting at elementary schools in Central Texas and student travel behavior.



Methods – Study Design

- Safe Travel Environment Evaluation in Texas Schools (STREETS) Study
- 5-year NIH funded natural experiment
- Evaluation of the health effects of City of Austin Safe Routes to School infrastructure
- 94 elementary schools recruited
- Two study designs:
 - **Serial cross-sectional**
 - ACS tally collected each semester
 - School health policy surveys collected annually
 - Subset of schools participating in quasi-experimental cohort



Methods – Measures



School policies and programs

- Baseline STREETS School Health Policy Survey
 - Completed by principals, assistant principals, PE/health teachers
 - 2018 – 2019 school year
- **Aggregate school policy score** developed from 7 survey items:
 - Curriculum encouraging walking and biking to school
 - Existence of crossing guard programs
 - Signage in the school promoting walking/ biking to school
 - Existence of school-wide SRTS policy
 - Walk/Bike to School Day initiatives
 - Walking School Bus
 - Other policies or programs to increase walking/ biking to school
 - i.e. pick up and drop off policies

Methods – Measures



Active commuting to school

- Baseline STREETS ACS Tally
 - 2018 -2019 school year
 - Measured using the standard Safe Routes to School student tally method
 - Students asked by classroom teacher about transport to/from school
 - Collected across three weekdays in 3rd, 4th and 5th grade classrooms
- Percentage of students using active transport modes averaged across the three weekdays

Methods – Statistical Analyses



- School level confounders: economic disadvantage, racial/ethnic distribution, neighborhood connectivity
- Multilevel linear regression models with classrooms nested within schools
 - Three models were run:
 - Main effects, unadjusted
 - Main effects, adjusted for the school-level confounders
 - Interaction model for school policy x grade
- All analyses in R (RStudio Version 1.3.959)

Results – School Characteristics



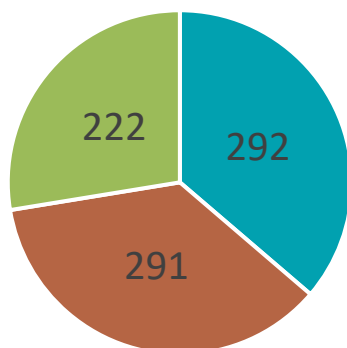
77 elementary schools with tally data and policy surveys at baseline



Number of participating students: **16,379**



Number of
participating
classrooms:

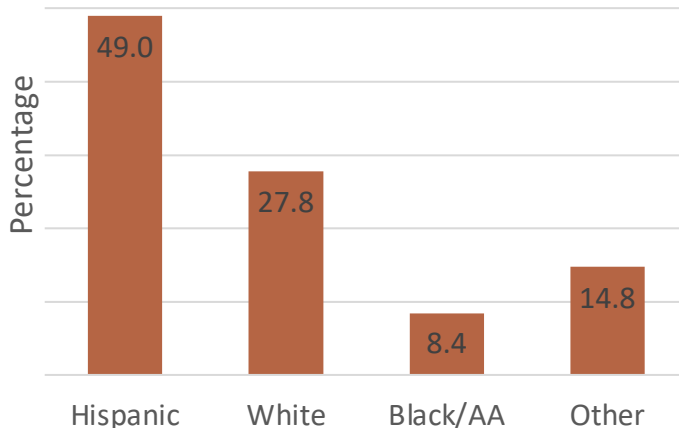


■ 3rd Grade ■ 4th Grade ■ 5th Grade



Average percent
students eligible
for free/reduced
lunch: **46.4%**

Racial/ethnic
distribution of
participating
schools:



Average percent
students who
walk/bike to
school: **14.5%**

Results – Policy and ACS

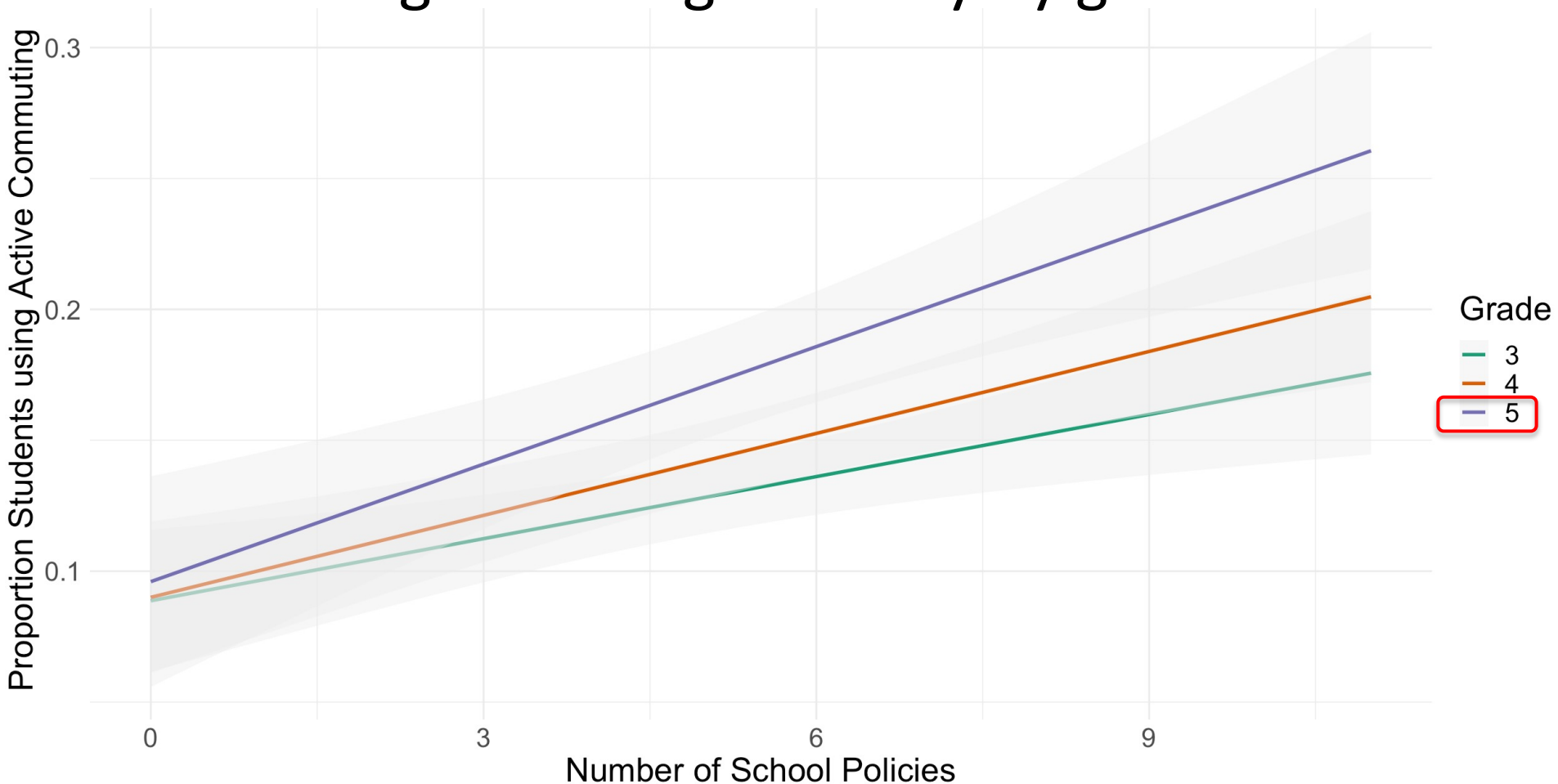


	Unadjusted Main Effects Model Coefficient (SE)	Adjusted Main Effects Model Coefficient (SE)	Interaction Model Coefficient (SE)
School Policy Index	0.008 (0.004)*		
Economic disadvantage			
Percent minority students			
Neighborhood connectivity			
3 rd Grade			
4 th Grade			
5 th Grade			
Index x 3 rd Grade			
Index x 4 th Grade			
Index x 5 th Grade			

Notes: * $p < .05$

Results – Interaction

- Association of school policy and student active commuting varied significantly by grade



Conclusion & Implications



- Highlights importance of school policy environment to increasing ACS in elementary students.
- “More is better”
- Older students may be more influenced by school policies than younger students.
 - Independent mobility
 - Parental safety concerns
- Limitations
 - Predominantly one school district
 - Limited in determining the length of time these policies and practices have been in place
 - Implementation of policies

Thank You!



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Conclusion & Implications



Variable	Survey Question
Active Commuting Program ¹⁹	Have any of the following improvements been made (or will be made) at your school this year? (2018-2019)
	Program to increase walking/biking to and from school?
Both ^{12, 20}	Has (or will) any curriculum encouraging walking and biking to school (i.e. Safe Routes to School) been (or will be) taught in the classroom this year (this includes bicycle and pedestrian safety education and encouragement)?
	a. Third Graders
	b. Fourth Graders
	c. Fifth Graders
Practice	Is there signage in the school promoting walking and/or biking (active commuting) concepts, practices, and objectives?
Both ¹²	Has your school adopted a policy that supports or promotes walking or biking to and from school?
School Practice ¹⁴	Does your school have crossing guards? If so, how many paid? If so, how many volunteers?
Active Commuting Program ¹⁶	Walking School Bus Participated/conducted 2017-2018 school year? Participated/conducted 2018-2019 school year?
Active Commuting Program ¹⁷	Walk to School Day Participated/conducted 2017-2018 school year? Participated/conducted 2018-2019 school year?