Associations of Reported Crime and Children's Active Commuting to School: The Safe TRavel Environments Evaluation in Texas Schools Study (STREETS).

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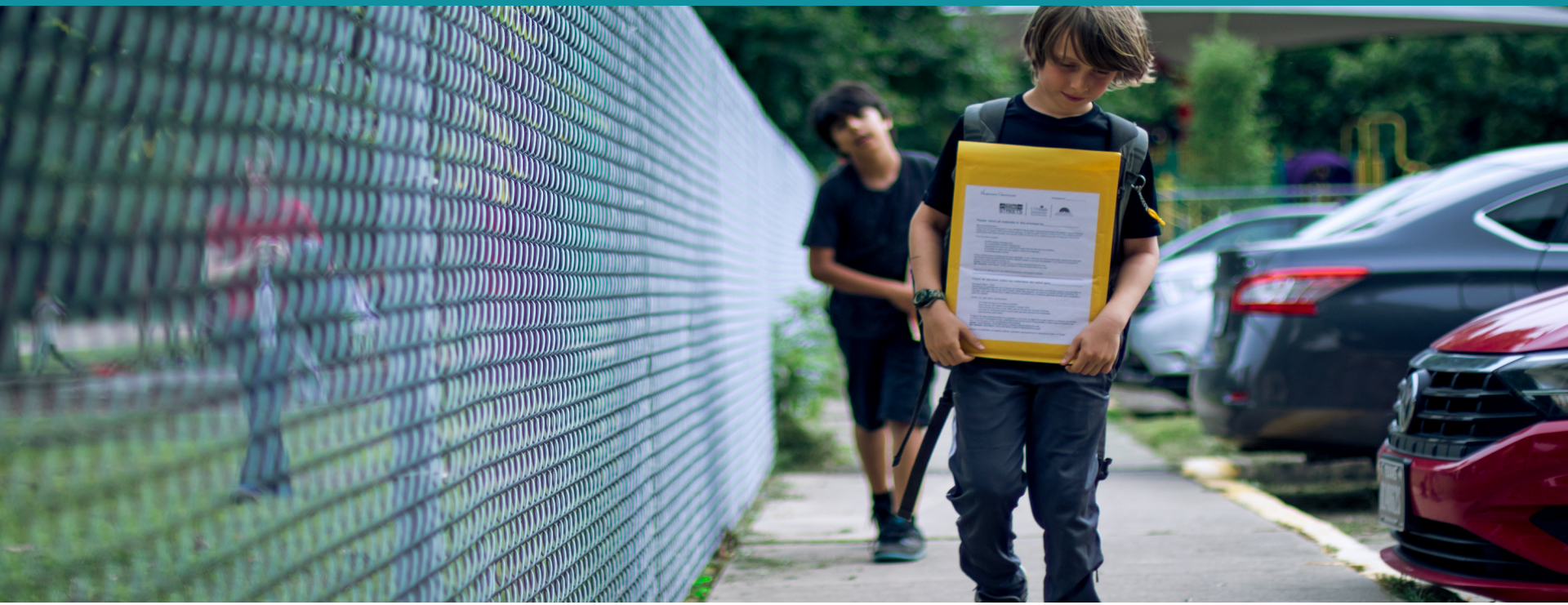

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Active Commuting to School

- Active commuting to school (ACS) represents one opportunity for children to be meet physical activity guidelines.

- ACS prevalence is declining

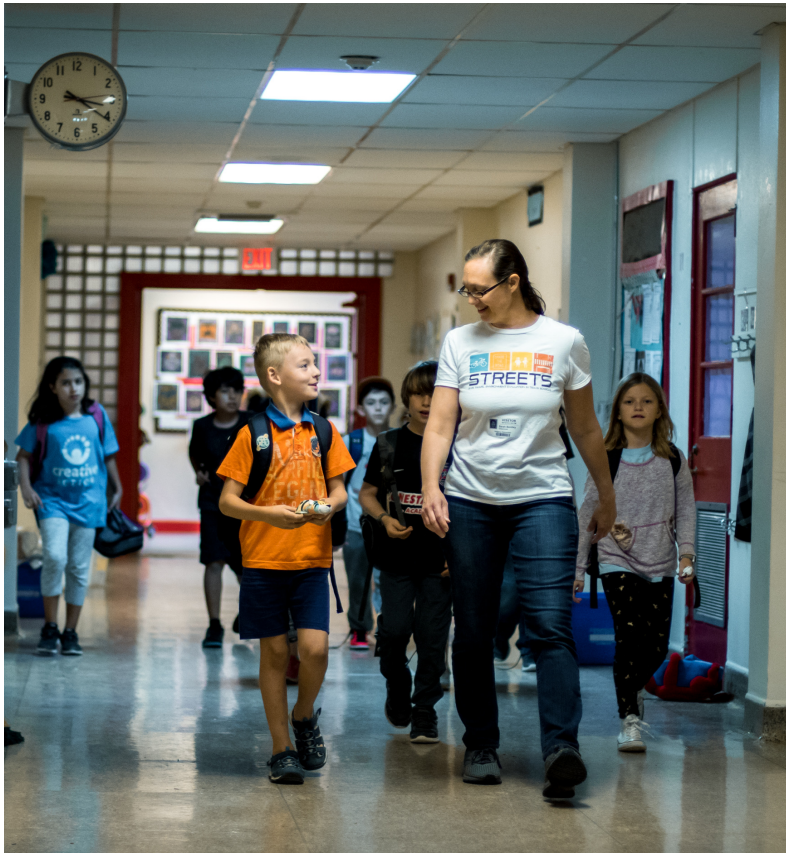
- The proportion of K-8 students who ACS fell from 47.7% in 1969 to 12.7% in 2009 (McDonald, 2011).

Factors Associated with ACS

- Individual: parent and child perceptions, SES, race/ethnicity

- Environment: distance, weather, transportation infrastructure, traffic safety, and **crime safety**

- Policy: school policy



Crime

- Crime is measured:
  1. Subjectively as parental and child perceptions of crime
  2. Objectively as reported crime rates
- Perception of crime is a commonly reported barrier to children's ACS (Davidson, 2008; Lee, 2013).

- There are **inconsistent** and **limited findings** describing the associations of **police-reported crime rates** and ACS, proximal to elementary schools.
- No evidence describing differences in **type of crime** (e.g., serious, less serious, violent, property) and associations with ACS.

AIMS

Primary Aim: To determine the associations between police-reported crime rates and active commuting to school, after controlling for neighborhood-level confounders (e.g., household income, multifamily dwellings, neighborhood connectivity).

Secondary Aim: To determine the associations between household income and police-reported crime rates proximal to schools.

Primary Exposure: Police-Reported Crime Rates

Five Variables for Police-Reported Crime Rates: operationalized using FBI Uniform Reporting Definitions:

1) **Total crime rate per year (2018)**
2) **Less serious crime rate**: drugs, simple assaults, public intoxication etc.
3) **Serious crime rate:** sum of violent and property crime
4) **Violent crime rate:** murder, rape, aggravated assault, robbery
5) **Property crime rate:** burglary, theft, auto theft

- All **one-year crime rates** defined as the number of reported crimes per 1000 population per year within a 1-mile Euclidean buffer of each school (%).

Data Sources:

2018 City of Austin open data

2018 census block group population 5-year estimates - weighted by the percent of area that fell within the school buffer

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Confounding Variables

1) **Household Income:** median household income within 1-mile Euclidean buffer of each school ($)
2) **Multifamily dwelling:** percentage of households that are multifamily dwellings within a 1-mile Euclidean buffer of each school (%)
3) **Neighborhood Connectivity**: count of 3- and 4-way intersections within 1-mile Euclidean buffer of each school using road network (n)

Data Sources:

2018 census block group 5-year estimates - weighted by the percent of area that fell within the school buffer.

Primary Outcome: ACS

- STREETS baseline data (2018-2019)
- **Active commuting to school:** percentage of students using active transport modes (walking or biking) averaged across three consecutive school weekdays.
- Collected using standard teacher-administered classroom tally among 3rd, 4th, and 5th grade classrooms

Key	Weather	Student Tally	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
	S= sunny R= rainy O=overcast SN=snow	Number in class when count made	-	-	-	Only with Children from your family	Riding with children from other families	City bus, subway, etc.	Skate-board, scooter, etc.
Sample AM	S N	2 0	2	3	8	3		3	1
Sample PM	R	1 9	3	3	8	1	2	2	

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Statistical Analysis

- **Descriptive statistics** frequencies with proportions, means with standard deviations (± SD), and medians with interquartile range (IQR).
- **5 linear mixed effects models** analyzed the associations of crimes rates (e.g., total, serious, less serious, property, violent) and ACS adjusted for neighborhood-level confounders using clustering within schools.
  - Standardized all variables
- **5 simple linear regression models** predicted the associations of household income and crime rates around schools.
  - Standardized all variables

Descriptives

School-Level Characteristics	Total Sample (N=63)
Minority (Hispanic or African American)	70%
Low-income (free/reduced lunch)	57%
ACS	14%

Primary AIM Results

Results from Linear Mixed Effect Analyses

Primary Exposures	ACS
Total Crime Rate	**0.30***
Less Serious Crime Rate	**0.30***
Serious Crime Rate	0.25
Property Crime Rate	0.23
Violent Crime Rate	**0.28***

**p<0.05, standardized B*

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Secondary AIM Results

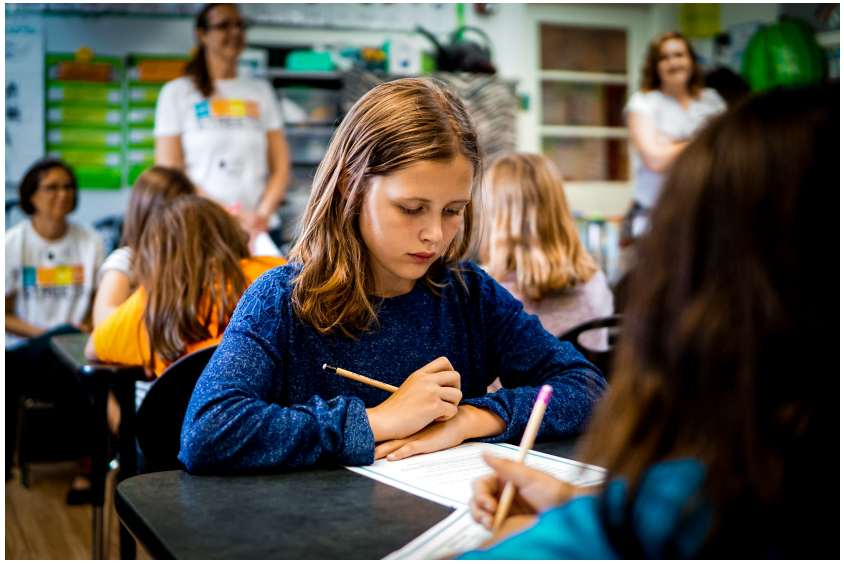
Results from Simple Linear Regression Analysis

	Total Crime Rate	Less Serious Crime Rate	Serious Crime Rate	Property Crime Rate	Violent Crime Rate
Household Income	-0.53***	-0.48***	-0.54***	-0.46***	-0.55***

****p<0.001, standardized B*

Conclusions

- Total reported crime rate is significant and directly associated with ACS.
- Less serious and violent crime rates are also significant and directly associated with ACS.
- Household income was significantly and inversely associated with all types of reported crime rates.



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Implications & Next Steps

- Include more neighborhood contextual factors (e.g. perception of crime)
- Consider distance of buffer (e.g. 1 mile, ½ mile, ¼ mile)
- Need for more objective measures of ACS and police-reported crime rates
  - Crime is underreported to police

Thank You! Questions?

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Strengths and Limitations

Strengths

- Large number of diverse schools and neighborhoods
- Inclusion of types of crime rates

Limitations

- Cross-sectional design
- Need to include other confounding variables (e.g., perception of crime)
- Need for better measures of reported crime rates and/or ACS
  - Reported crime rates are underreported to police