"Do you see what I see?" – Correlates of multidimensional measures of neighborhood forms and perceived physical activity-related neighborhood barriers and facilitators for urban youth

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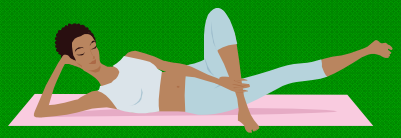
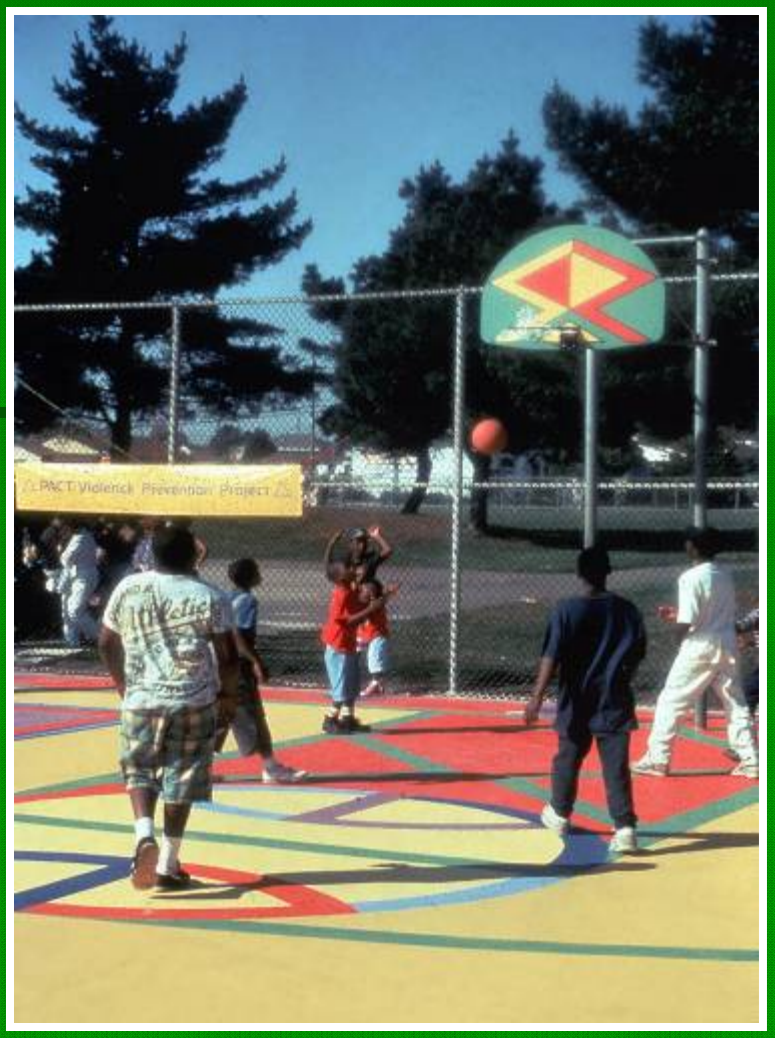
Presentation Outline

- Background
- Objectives
- Methods
- Results
- Conclusions



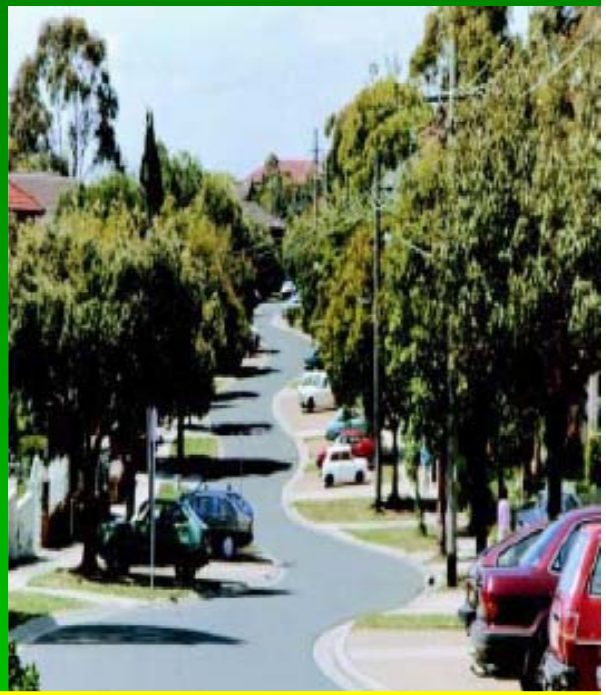
Environmental Change is Critical to Promoting Healthy Eating and Active Living



Many features of the built environment might influence recreational or travel-related activity

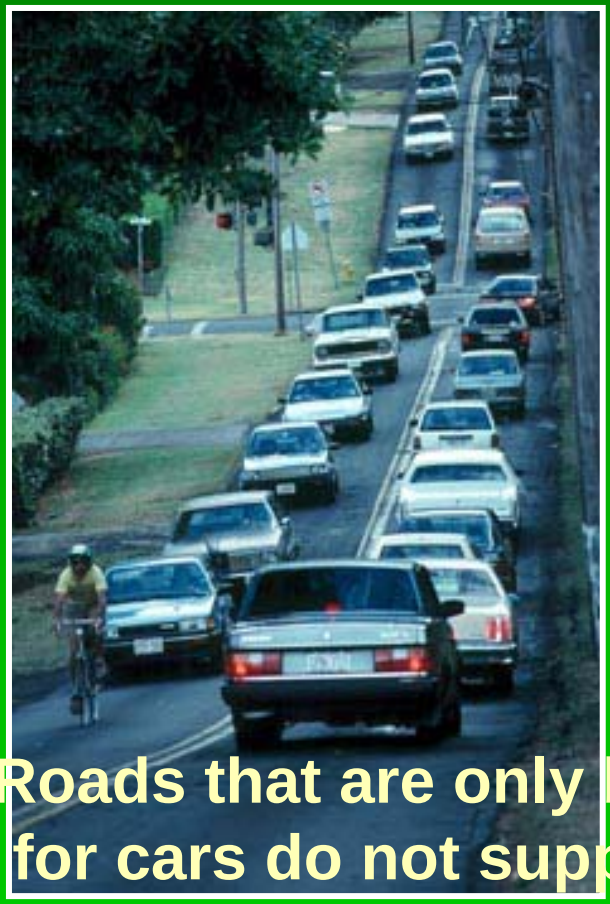
- Recreational Resources

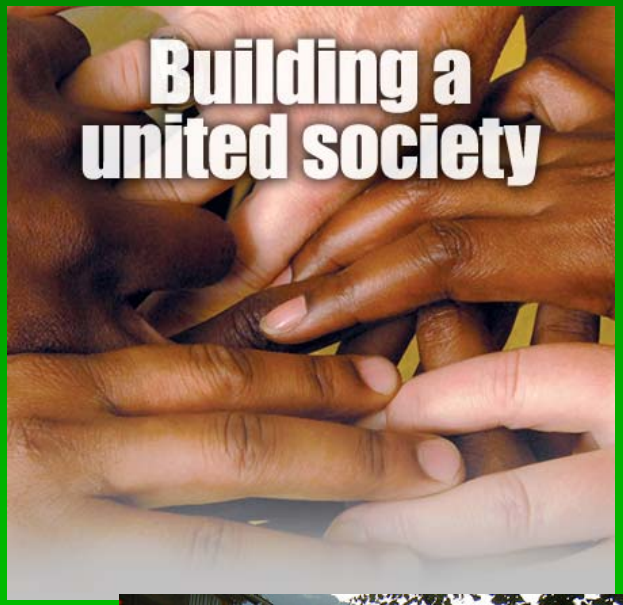
Land Use Characteristics



Neighborhood Form Characteristics

Community Environment characteristics --





Roads that are only built for cars do not support active behaviors and may lead to unintentional injuries.

Objectives

(1) To classify meaningful patterns (forms) of neighborhood environment that have been identified as potentially important determinants of physical activity.

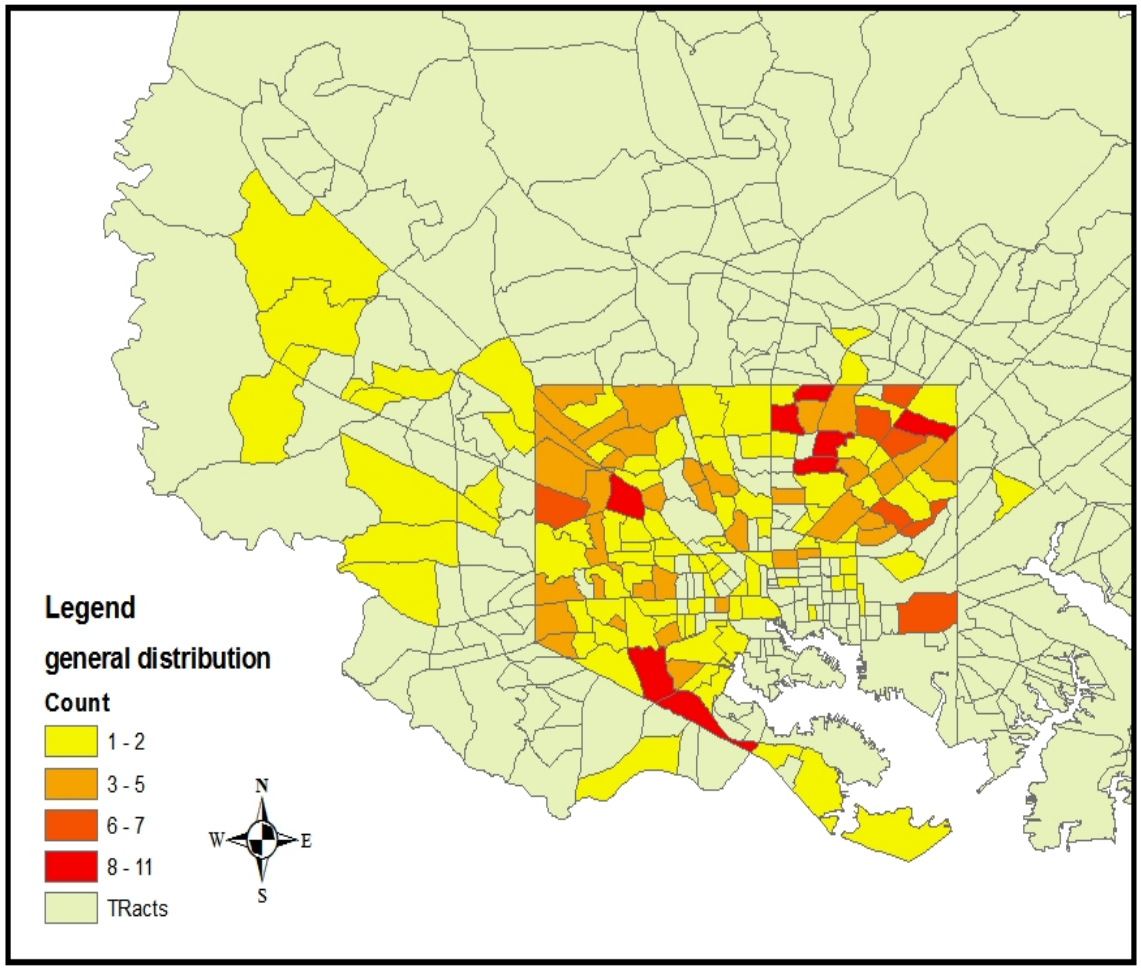
(2) To examine the gender-specific cross-sectional associations between these neighborhood patterns (forms) and perceptions on physical activity-related neighborhood barriers and facilitators in predominately minority youth.

Unique contributions

1. It validates the multi-dimension pattern analysis used by Nelson et al.
2. It examines correlations of multi-dimensionally measured neighborhood forms with perceptions of physical activity-related neighborhood factors in minority youth.
3. Potential gender-specific associations are considered because there is qualitative evidence to supports the hypothesis that adolescent boys and girls have different perceptions of their neighborhood environment.

Methods

Student distribution in Census Track



Data source: US Census Bureau, 2000

1) 9th through 12th graders from two high schools in Baltimore, Maryland
2) Enrolled in the **Baltimore Active Living Teens Study**
3) Recruitment rate=54%
4) Each participant's parent or guardian provided written informed consent, and all subjects assented to participation
5) UMD IRB approval

Methods: Measures

Part I-Objective Measures:

1)2000 U.S. Census;

2)2002 Land Use/Land Cover;

3)parcel level data from Maryland Property View;

4)Transit View which includes data for bus, Metro, and light rail.

All attributes were measured and calculated at the census tract level for Baltimore City and Baltimore County.

15 Neighborhood attribute measures

- Land-use mix
- Density
- Street pattern/circulation systems
- Accessibility

(Cervero & Radisch, 1996; Filion & Hammond, 2003; Friedman, Gordon, & Peers, 1994; Handy, 1996; Song & Knaap, 2004).

Methods: Measures

Part II-Perception Measures:

Neighborhood Environment Walkability Survey NEWS (Saelens, et al., 2003)

1) **Land use mix: accessibility (**6-item subscale, α=0.62)
2) **Neighborhood safety** (5-item subscale, α=0.71)
3) **Pedestrian/traffic safety** (4 items (α=0.66)

Methods: data collection
Self-report and objective measures

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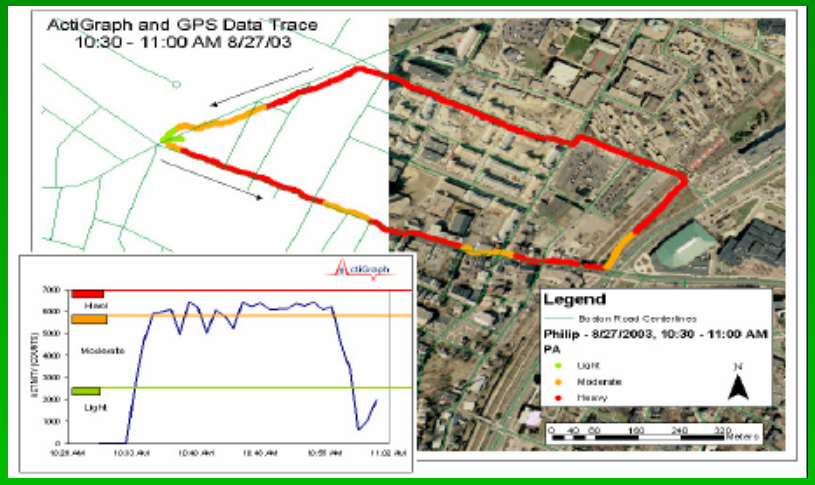

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Survey:

Behaviors, attitudes, demographics

Accelerometer, Land Use/Land Cover

Travel diary/log: self report travel and physical activity

Students completing 3-day physical activity recall

Students completing online survey

Staff orienting students on accelerometer wearing

Staff measuring students' height and weight

Statistical analysis

Neighborhood forms classification

1) identifying 15 relevant attributes of physical urban form and computing indicators of those attributes
2) using factor analysis to derive generalized dimensions of neighborhood characteristics;
3) performing cluster analysis to group the variation in neighborhood form in individual census tracts;
4) geocoding the individual addresses (ArcGIS 9.1.3) and assigning a neighborhood type for each residence based on its spatial distribution.

Statistical analysis, cont.,

1) The dependent variables: self reported perceptions of the environments
2) The independent variables: the neighborhood form/patterns. Demographic variables (e.g., age, grade) were covariates.
3) Gender-specific Chi square tests and multinomial logistic regression examined the association between neighborhood perception variables and neighborhood forms.

Results:

- The Neighborhood form/patterns

1) Arterial development
2) Inner city area
3) Suburban residential
4) Central business district

Table 1. Characteristics of study participants and health parameter measures

Characteristics	% or mean (s.d)[c]
Gender (%)	
Girls	58.4
Boys	41.6
Race/ethnicity (%)	
Black	69.1
White, non-Hispanic	16.6
Other	14.3
Grade (%) (9-12th)	
9th	32.6
10th	23.4
11th	13.1
12th	30.9
Parent's education level (%) (Father's/Mother's)	
High school	47.8/31.5
College	42.3/56.8
Advanced degree	9.9/11.7
BMI[a] (%)	
Normal	54.6
At risk of overweight	16.6
Overweight	17.7

Note: n=326

Results:

Associations between neighborhood forms and perception on physical activity-related neighborhood barriers and facilitators

variables		
Access	**Intercity Neighborhoods vs. Central Business District**	**Suburban Residential vs. Central Business District**
1. Stores within easy walking distance		
Girls	1.33(0.39 - 4.54)	0.63(0.26 - 1.51)
Boys	0.33(0.09 - 1.22)	0.55(0.17 - 1.83)
2. Can do most of my shopping at local stores		
Girls	0.88(0.36 - 2.11)	1.23(0.59 - 2.55)
Boys	0.36(0.11 - 1.15)	0.51(0.19 - 1.38)
3. Parking difficult in local shopping areas		
Girls	1.10(0.45 - 2.71)	0.99(0.46 - 2.13)
Boys	2.15(0.63 - 7.37)	1.23(0.44 - 3.45)
4. Good places to go within easy walking distance of home		
Girls	1.54(0.58 - 4.06)	1.06(0.51 - 2.2)
Boys	0.61(0.2 - 1.91)	1.41(0.52 - 3.83)
5. Easy to walk to bus or train stop from my home		
Girls	4.57(0.56 - 37.68)	0.61(0.23 - 1.59)
Boys	0.4(0.11 - 1.43)	1.95(0.46 - 8.35)
6. Hill make it hard to walk in neighborhood		
Girls	1.28(0.48 - 3.36)	1.14(0.51 - 2.53)
Boys	1.54(0.45 - 5.22)	1.22(0.44 - 3.38)
Traffic Safety		
7. Traffic on street is usually slow		
Girls	2.61(0.97 - 7)	1.13(0.55 - 2.32)
Boys	0.45(0.15 - 1.37)	1.41(0.57 - 3.49)
8. Crosswalks to help walkers cross busy streets		
Girls	0.78(0.29 - 2.13)	**0.32(0.15 - 0.7)***
Boys	0.98(0.33 - 2.9)	1.44(0.54 - 3.82)

9. Pedestrian traffic signals help walkers cross busy streets		
Girls	0.55(0.21 - 1.41)	0.34(0.16 - 0.72)*
Boys	0.8(0.26 - 2.46)	1.28(0.5 - 3.26)
10. Sidewalks on most streets in neighborhood		
Girls	2.29(0.47 - 11.2)	0.55(0.22 - 1.39)
Boys	0.29(0.04 - 1.86)	0.36(0.07 - 1.98)
Neighborhood Safety		
11. Neighborhood streets are well lit at night		
Girls	0.66(0.26 - 1.69)	0.64(0.29 - 1.41)
Boys	0.71(0.22 - 2.33)	1.36(0.51 - 3.65)
12. Common to see walkers and/or bicycle riders in neighborhood		
Girls	0.8(0.31 - 2.11)	0.63(0.29 - 1.38)
Boys	0.33(0.11 - 1.02)	1.56(0.57 - 4.25)
13. If bicycle in neighborhood, feel safe from cars		
Girls	2.85(1.03 - 7.92)*	1.37(0.63 - 2.99)
Boys	0.56(0.18 - 1.73)	1.65(0.61 - 4.44)
14. Unattended or stray dogs in neighborhood		
Girls	0.61(0.24 - 1.50)	0.79(0.37 - 1.69)
Boys	1.00(0.32 - 3.12)	0.63(0.25 - 1.62)
15. Lot of crime in neighborhood		
Girls	1.21(0.46 - 3.18)	0.97(0.44 -2.14)
Boys	2.75(0.84 - 8.98)	0.91(0.34 -2.47)

Implications

- Expand our understanding of the traditional urban/suburban/rural classification
- Adolescents living in different neighborhood forms had different perception of their environmental characteristics related to physical activity.

Implications

- Gender differences regarding the perceived importance of environmental characteristics (Ries, et al., 2008b).

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