UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE

Perceptions of the Physical Environment Surrounding Schools & Physical Activity

among Low-income, Urban, African American Adolescent Girls

Erin Hager, PhD
Candice Gormley, BS
Laura Latta, MHS
M. Reese Pepper, RD, PhD
Dawn Witherspoon, PhD
Maureen Black, PhD

Background

- Low-income, urban, African American adolescent girls experience low rates of PA and high rates of obesity
- Positive perceptions of the physical environment near the homes of adolescent girls have been associated with higher levels of PA*

*Evenson 2007, Voorhees,2010

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- Low-income, urban, African American adolescent girls experience low rates of PA and high rates of obesity
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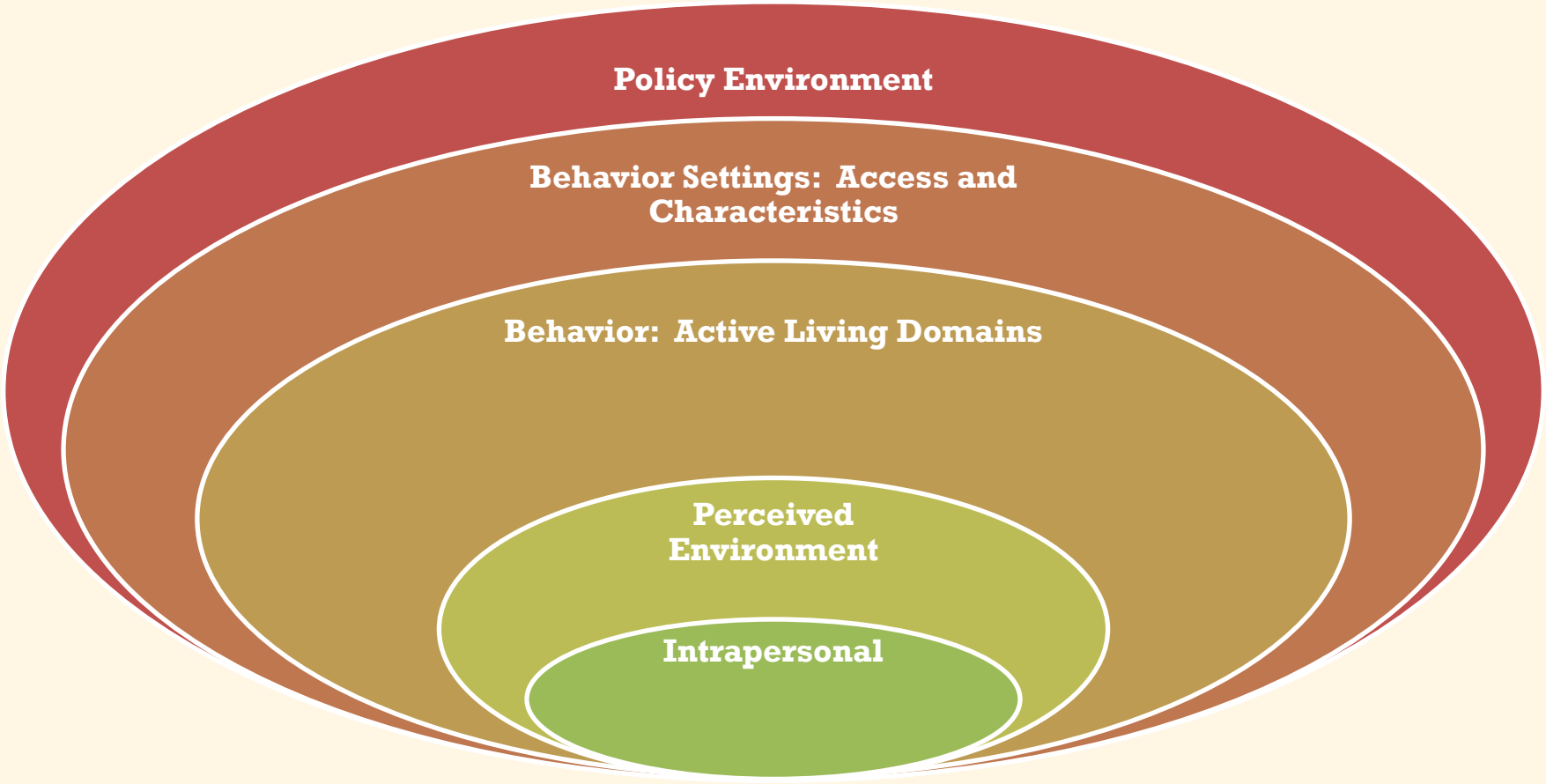
Examining whether perceptions of the physical environment surrounding schools are associated with PA could have important policy implications

*Evenson 2007, Voorhees,2010

Objective

- To examine the relationship between adolescent girls' perceptions of the physical environment surrounding their schools and their objectively measured physical activity
  - Hypothesis: adolescent girls with a positive perception of the environment surrounding their school will be more active than girls with a less positive perception

Conceptual Framework: Ecological Model of Active Living



Sallis et al, 2006

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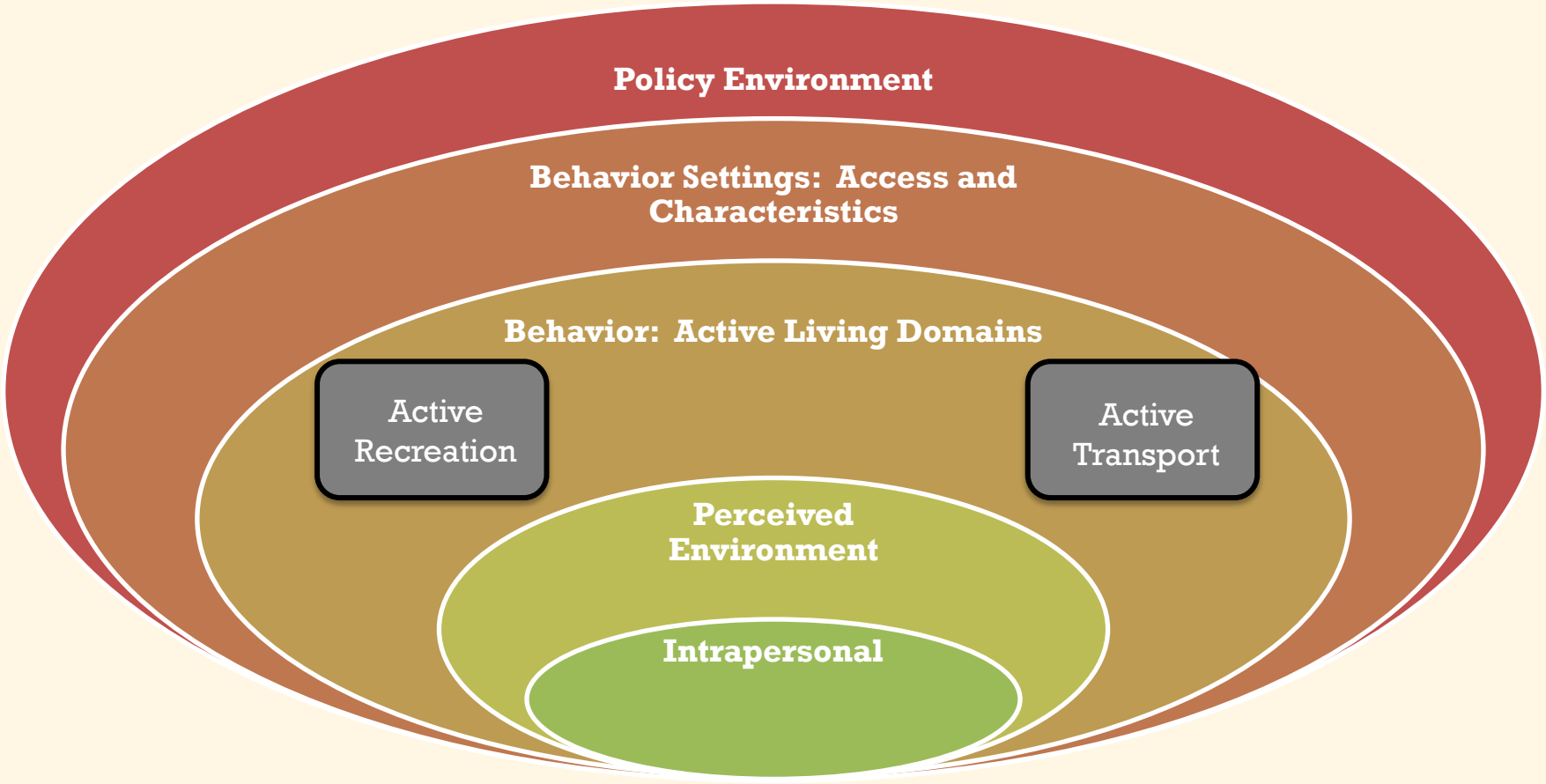

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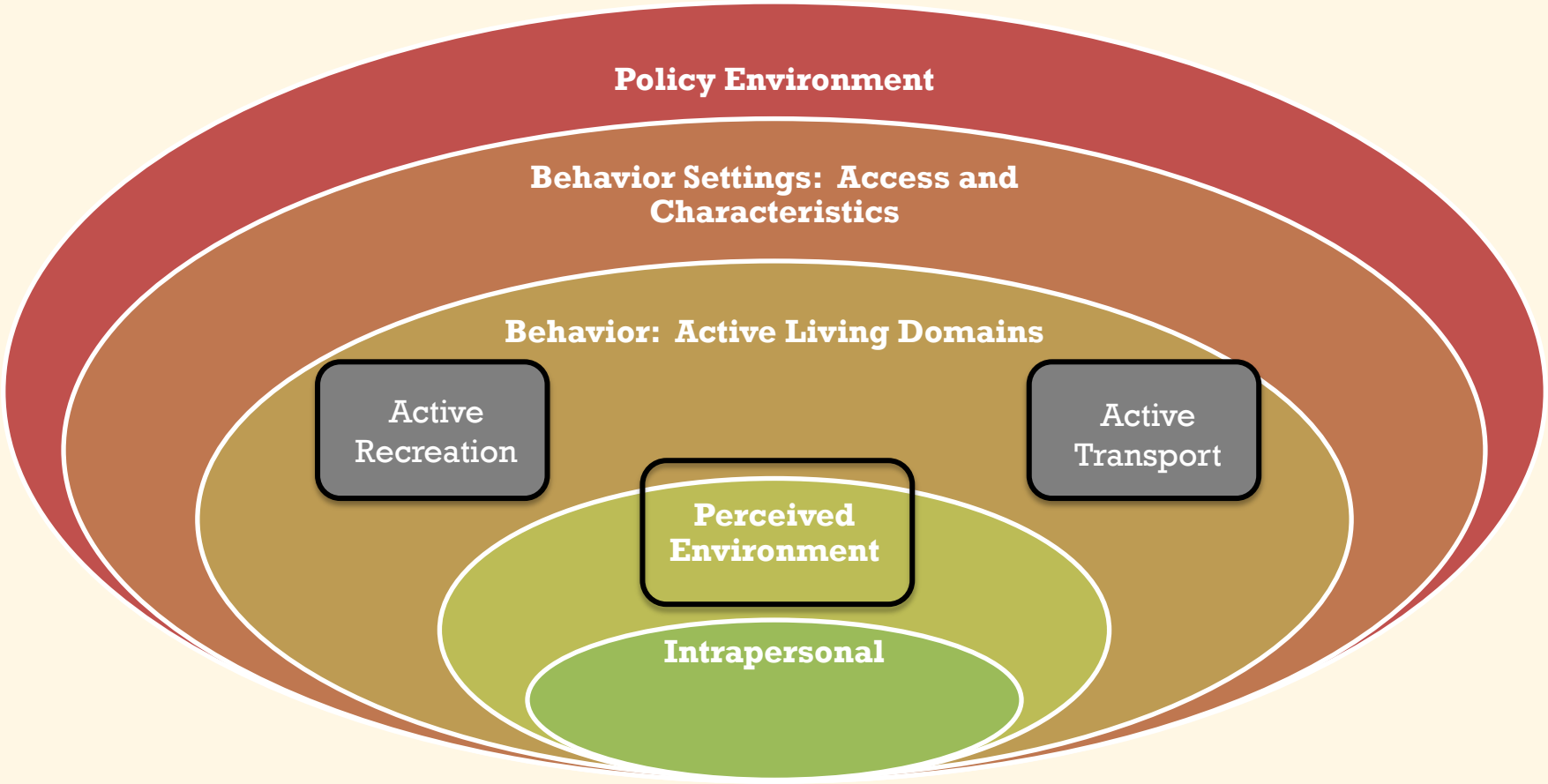

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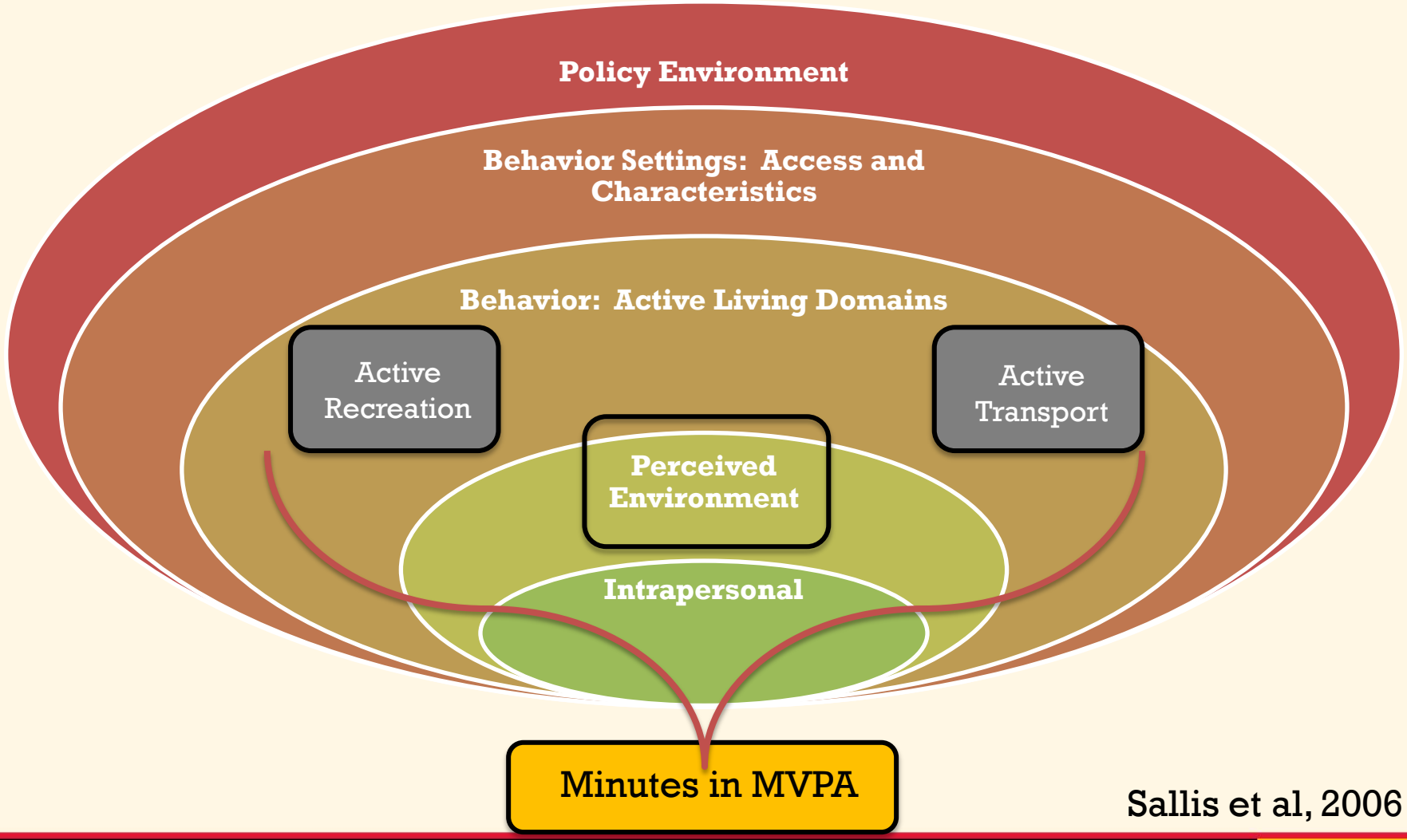

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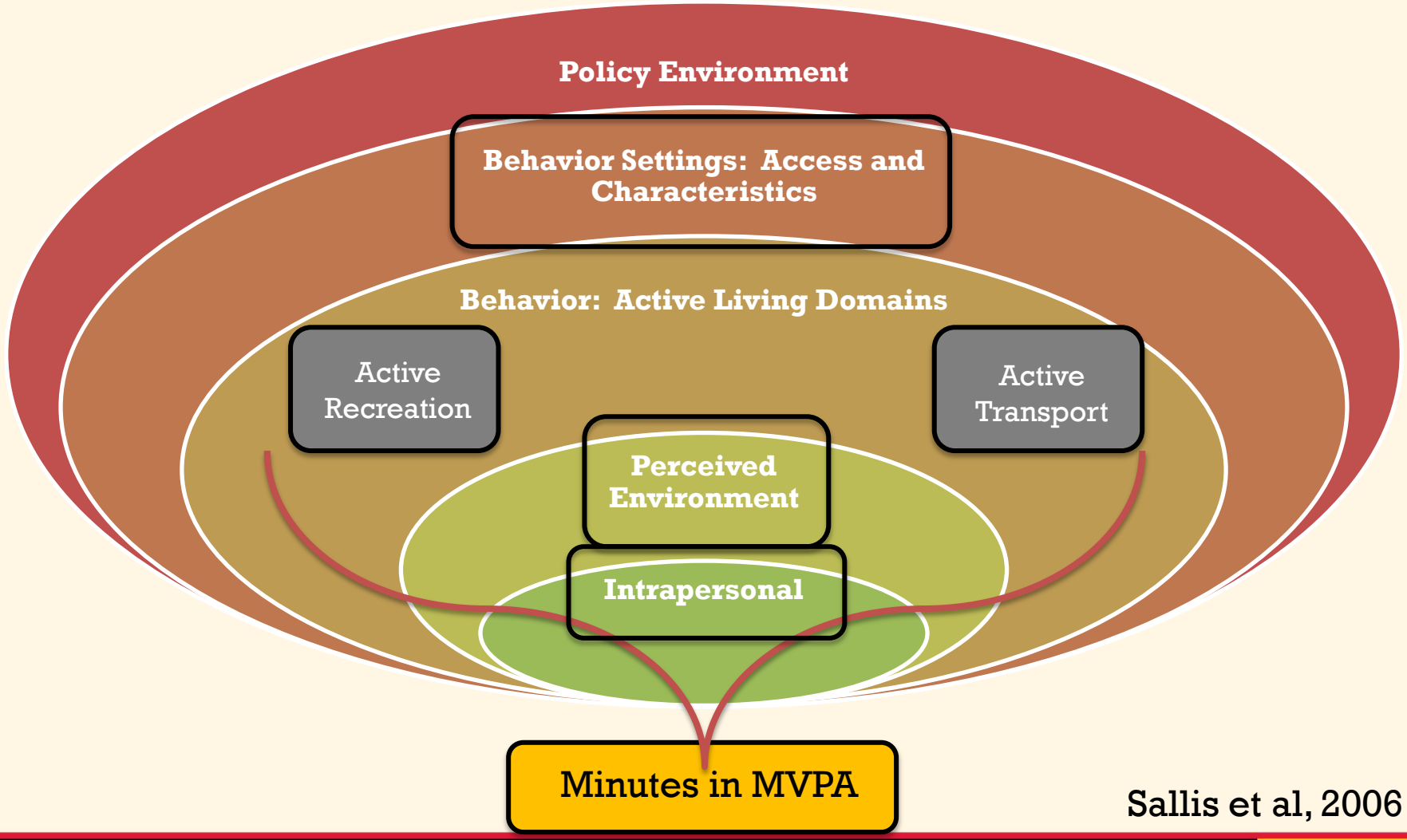
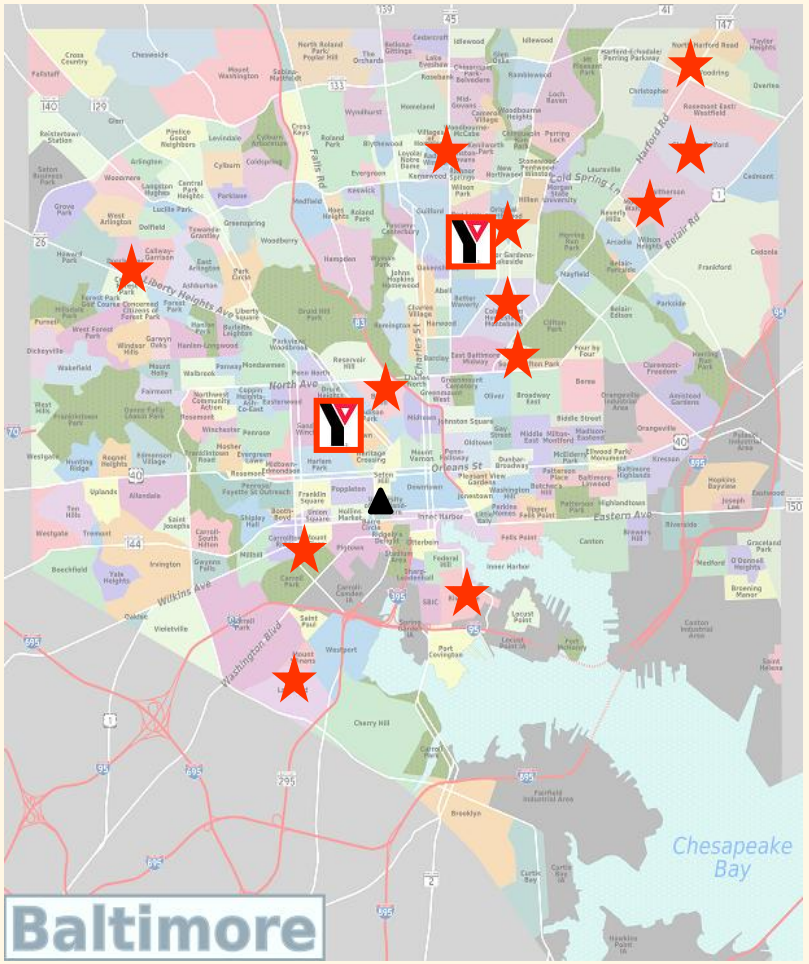


Sallis et al, 2006

Methods

Recruitment:
Challenge! in Schools

- School-Level Inclusion Criteria
  - Within 7 miles of a YMCA
  - >75% of the students receive free/reduced priced lunch
  - >70% of the students African American
- Individual-Level Inclusion Criteria
  - 6th or 7th grade girl
  - Able to engage in physical activity (~PE class)
  - No weight criteria



Methods

Physical Activity: Accelerometry

- Actical (Philips Respironics, Inc.)
- Worn on the ankle for ≥7 consecutive days
- First and last days truncated
- Minutes in moderate-vigorous physical activity (MVPA) determined using a validated cut-off of 3200 counts/minute

Body composition:

- Calculated BMI-for-age percentiles from height and weight (measured in ≥duplicate)

Methods

Perception of the Physical Environment Around the School:

10-item questionnaire (Evenson et al. 2007)

- Safety, aesthetics, and access to physical activity facilities
- Changed "near your home" to "near your school"
- Questionnaires administered using audio enhanced computer-assisted software
- Scoring:
  - Individual items
  - Factor Analysis: 7-item mean score
  - Dichotomized schools by median score (high positive versus low positive)

Analysis Plan:

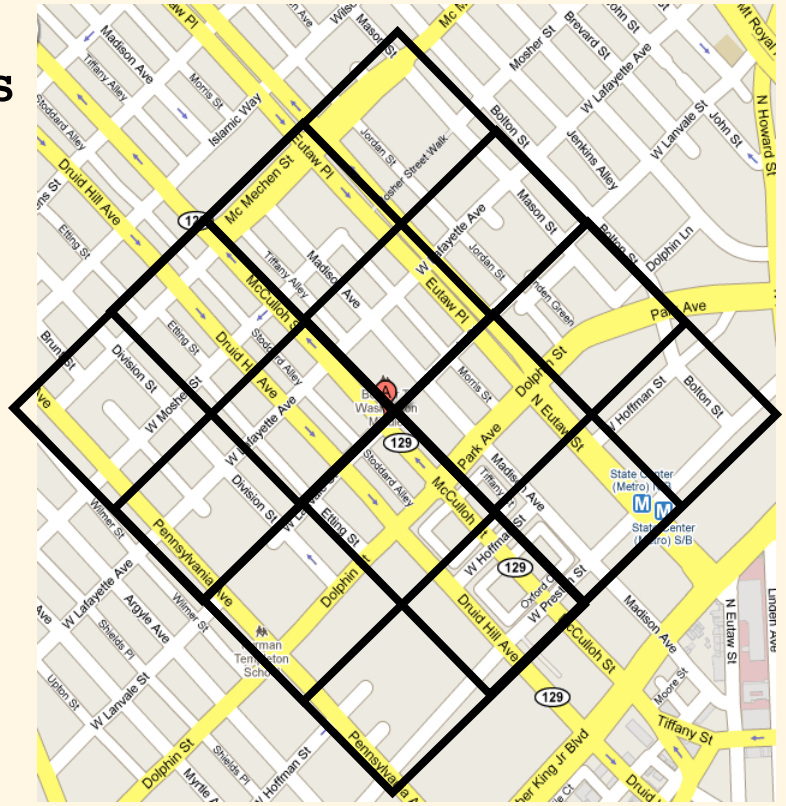
- Spearman correlations and T-tests
- Multi-level modeling

Methods

Active Neighborhood Checklist

(Hoehner, 2007)

- Driving audit with trained auditors
- Modifications included adding counts of physical activity facilities and food stores
- 16 segments were surveyed (¼ x ¼ mile each) per school, extending ½ mile from the school in a 4x4 grid pattern
- Categories included: (1) mixed land use, (2) quality of environment for pedestrians, and (3) walkability/ bicycle friendly



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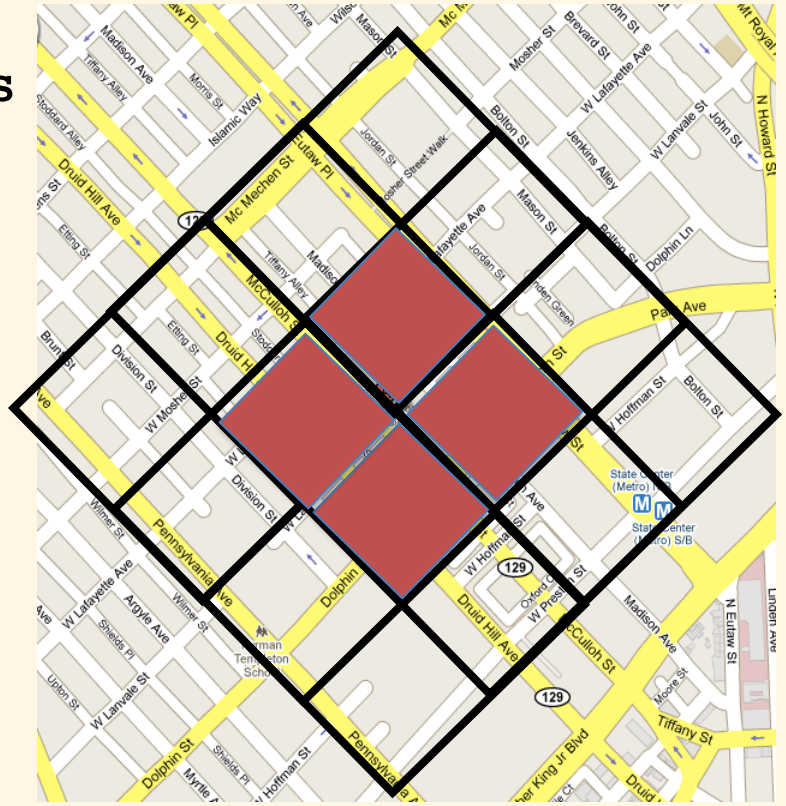

Results:

Sample Description

425 6th and 7th grade girls recruited

↓

290 randomized to receive an accelerometer

↓

239 with valid accelerometry data

↓

224 had complete data on perceptions of the environment

Results:
Sample Description

	% or Mean (range)
% 6th grade	55.4%
Age (years)	12.1 (10.1-14.4)
% Black or African American	84.2%
% Overweight or Obese	44.6%
MVPA (minutes/day)	35.4 (0-104.5)
% Meeting Recommended 60 min/day MVPA	11.6%
Distance to School (miles)	1.9 (0.03-9.0)

Results:

Perceptions of the environment surrounding the school

7-item scale	% Agree*
There are sidewalks on most streets near my school	86.2%
There are bicycle or walking trails near my school	42.4%
It is safe to walk or jog near my school	43.8%
Walkers and bikers on the streets near my school can easily be seen by people in their homes	52.2%
I often see other girls or boys playing outside around my school	73.7%
There are many interesting things to look at while walking near my school	48.2%
The streets near my school are well lit at night	37.9%

*"agree a little" or "agree a lot"

Results:

Perceptions of the environment surrounding the school

	% Agree*
There are many places I can go within walking distance of my school	47.3%
There is so much traffic that it makes it hard to walk near my school	25.9%
There is a lot of crime near my school	21.9%

*"agree a little" or "agree a lot"

Results:
Multi-Level Models

- Outcome: minutes engaging in MVPA,
  adjusting for school (level 1) and teen age, overweight/obese status, distance from home to school, and number of days wearing accelerometer (level 2)

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  - 7-item summary score:
    - β=1.50, p=0.370

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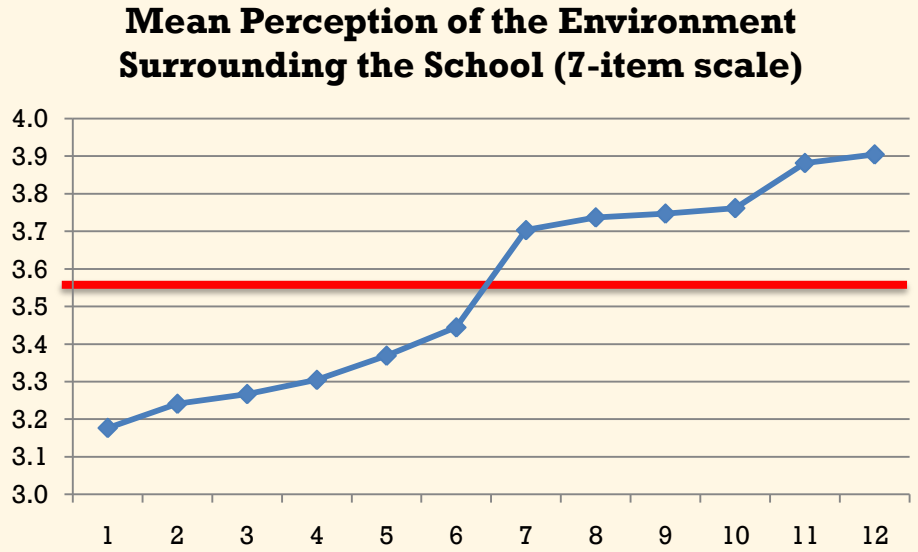
Multi-Level Models

- Outcome: minutes engaging in MVPA,
  adjusting for school (level 1) and teen age, overweight/obese status, distance from home to school, and number of days wearing accelerometer (level 2)
  - 7-item summary score:
    - β=1.50, p=0.370
  - Individual Items:
    - There are many places I can go within walking distance of my school: β=5.8, p=0.041 (agree versus disagree)

Results:

"Low-Positive" versus "High-Positive" Schools



- Median=3.57
- Mean of "High Positive" perception schools (n=6)=3.8
- Mean of "Low Positive" perception schools (n=6)=3.3
- t=5.2 ($p<0.001$)

Results:

"Low-Positive" versus "High-Positive" Schools

- Multi-Level Model, outcome: minutes engaging in MVPA, *adjusting for school (level 1) and teen age, overweight/obese status, distance from home to school, and number of days wearing accelerometer (level 2)*
  - **β=-6.5, p=0.040**

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	"Low-Positive" Perception Schools	"High-Positive" Perception Schools	t (p)
Minutes in MVPA	38.34	30.99	0.004
Distance from home to school (miles)	1.51	2.61	<0.001
Age (years)	12.3	11.9	0.001

Results:

Built Environment: ½ mile surrounding school

	"Low-Positive" Perception Schools	"High-Positive" Perception Schools
Graffiti or Broken Windows*	2.9	0.9
Abandoned homes or buildings*	2.5	0.5
# Food Sources	5.8	4.0
# Fitness Facilities	3.8	5.4
Parks*	0.1	0.8

*present in segment

Results:

Built Environment: ½ mile surrounding school

	"Low-Positive" Perception Schools	"High-Positive" Perception Schools	Correlation r(p)	
			Perception Score	Minutes in MVPA
Graffiti or Broken Windows*	2.9	0.9	-.21 (.002)	.15 (.026)
Abandoned homes or buildings*	2.5	0.5	-.18 (.008)	.14 (.035)
# Food Sources	5.8	4.0	ns	.20 (.002)
# Fitness Facilities	3.8	5.4	.15 (.029)	.16 (.018)
Parks*	0.1	0.8	.23(<.001)	ns

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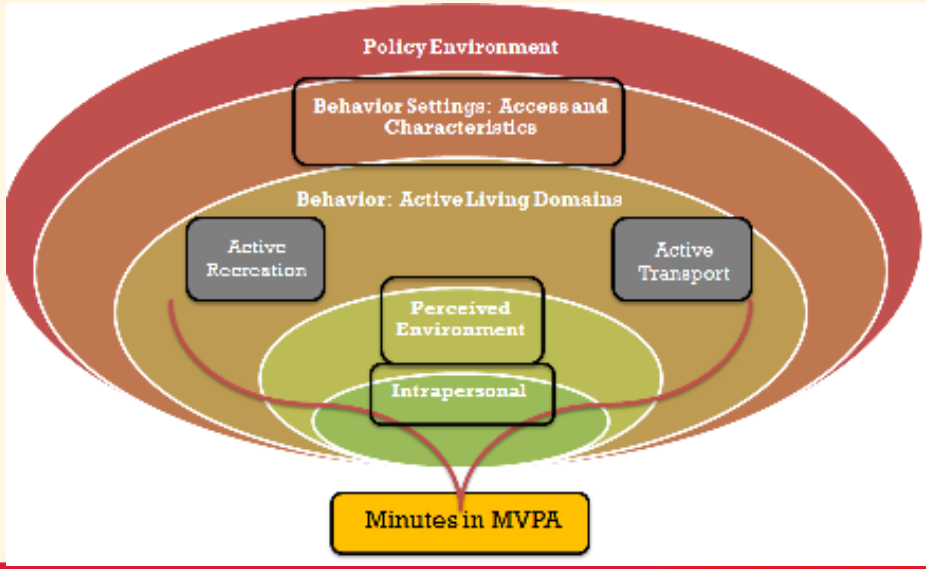
Conclusions

- Girls attending schools with more positive perceptions of the physical environment around the schools were significantly less active compared to girls with less positive perceptions
  - Did not support our hypothesis
  - Positive perceptions of physical environments surrounding schools may not be enough to encourage activity in urban environments to the extent that they may in suburban environments

- Both perceptions of having "places" to go within walking distance of the school and measured number of food stores/fitness facilities were positively related to PA



Strengths & Limitations

Strengths:

- Population
- Combination of methods: perceived and objective

Limitations:

- Not generalizable to other populations/ geographic areas
- Other data of interest not included: crime, parent perceptions

Policy Implications

- Policy makers have the ability to enact zoning laws near public schools that could influence the built environment

Next Steps…

Overall:

- Identify positive factors in urban neighborhoods around schools that are related to physical activity among adolescent girls

Challenge! in Schools data:

- Examine how neighborhood environment surrounding schools is associated with:
  - Obesity
  - Diet
- Utilize GIS mapping to examine the relationship between activity, diet, obesity and the home/school neighborhood environments

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Investigators

UMSOM: Maureen Black, PhD; Erin Hager, PhD; Soren Snitker, PhD; Larry Magder, PhD; Yan Wang, PhD

JHSPH: Joel Gittelsohn, PhD

UMBC: Carlo DiClemente, PhD

UMES: Margarita Treuth, PhD

UMA: Jean Anliker, PhD

Challenge! In Schools Team

Growth and Nutrition Division

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Thank you

Erin R. Hager, Ph.D.

ehager@peds.umaryland.edu

www.medschool.umaryland.edu/growth

	1	2	3
There are many places I can go within walking distance of my school	.383	-.104	.793
There are sidewalks on most streets near my school	.482	.097	.055
There are bicycle or walking trails near my school	.545	.063	.158
It is safe to walk or jog near my school	.636	.381	-.028
Walkers and bikers on the streets near my school can easily be seen by people in their homes	.622	-.069	-.089
There is so much traffic that it makes it hard to walk near my school	-.102	.756	-.025
There is a lot of crime near my school	.170	.726	-.100
I often see other girls or boys playing outside around my school	.460	-.320	-.553
There are many interesting things to look at while walking near my school	.630	-.221	.063
The streets near my school are well lit at night	.653	-.003	-.175