Neighborhood Design & Physical Activity:

Preliminary Results of a Longitudinal Study of Low-Income, Southern Women moving to Neotraditional or Suburban Neighborhoods

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The Public Health Challenge

- Physical inactivity has been recognized as a public health epidemic in the United States.

- Proponents of "new urbanism" or "neo-traditional" neighborhood design suggest that greater physical activity is among the likely benefits…

- However, little empirical research has examined the relationship between physical attributes of communities and patterns of physical activity among residents.

Research Design Challenges

- Often, aggregate level neighborhood features are correlated with community-level physical activity or travel patterns … need for **individual as the unit of analysis**.

- Most studies are cross-sectional… need for **longitudinal studies.**

- Ambiguous causal direction due to **self selection bias**

- Moreover, low-income people, African Americans, & those in Southeastern U.S. are particularly at risk for obesity… need to **understand at risk populations.**

The Study

- A "natural experiment" – with Habitat for Humanity partners before & after relocation.

- Focus on low-income, primarily African American women in the Southeastern United States.

- Half move to "**neotraditional**" neighborhoods (sidewalks, front porches, modest size lots, small setback distances)

- Half move to **conventional suburban** neighborhoods (large lots, substantial setbacks, long driveways, no sidewalks and no shared social recreational space).
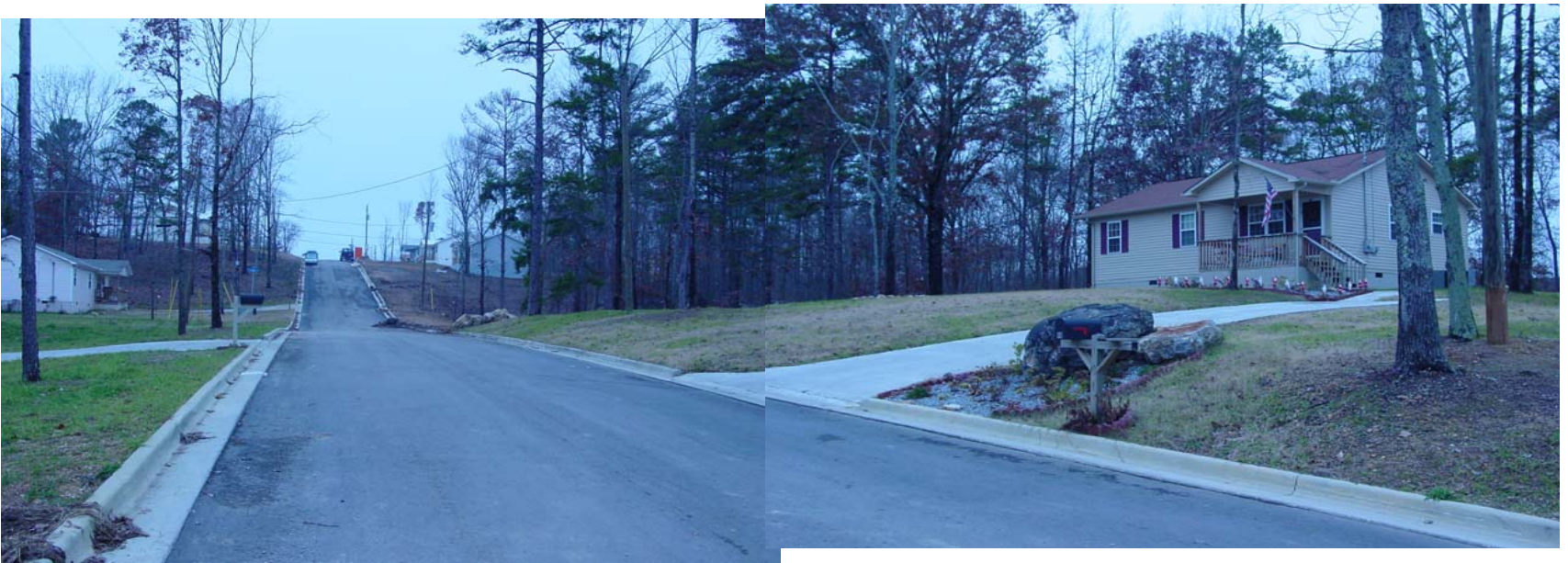
Research Design

- **Quasi-experimental**

- **Prospective** (Pre-move / Post-move) Study

- Pre-move data collected in a variety of communities

- Participants are **quasi-randomly assigned** to neighborhoods, eliminating self-selection bias.

Conventional Suburban Neighborhood: Post-Move

Town A

Neotraditional Neighborhood: Post-Move

Town B

Research Questions:

Cross- sectional:

1. Do neighborhood design and demographic factors predict physical activity ("PA")?

Longitudinal:

2. Does PA change after move to neotraditional or suburban neighborhood?

3. Do neighborhood design or demographic factors predict change in PA?

Research Participants

- Residents of Georgia, Alabama, Florida

- N = 99 women

- 72% African American, 22% Caucasian, 6% other

- mean age = 36, age range 23-66.

- 76% single; 24% married

- Body Mass Index (BMI)*, x= 32.1, range 19-50, (53% obese, 20% overweight, 27% healthy weight)

Constructs & Measures

Independent Variable(s)

a.   <u>Neighborhood Type</u>:   Suburban v. Neo-traditional

b.   <u>Neighborhood Characteristics – rated by on-site trained raters</u>:
presence & condition of sidewalks, prevalence of front porches, building
setback distances, building density, parking location, garage location

c.   <u>GIS-derived Neighborhood Characteristics</u>:

land use mix

street network patterns.

Street Network Pattern (GIS):
3- and 4-way intersections within network buffer zone

Survey House
Street Intersections
Network Buffer Zone (a quarter-mile)
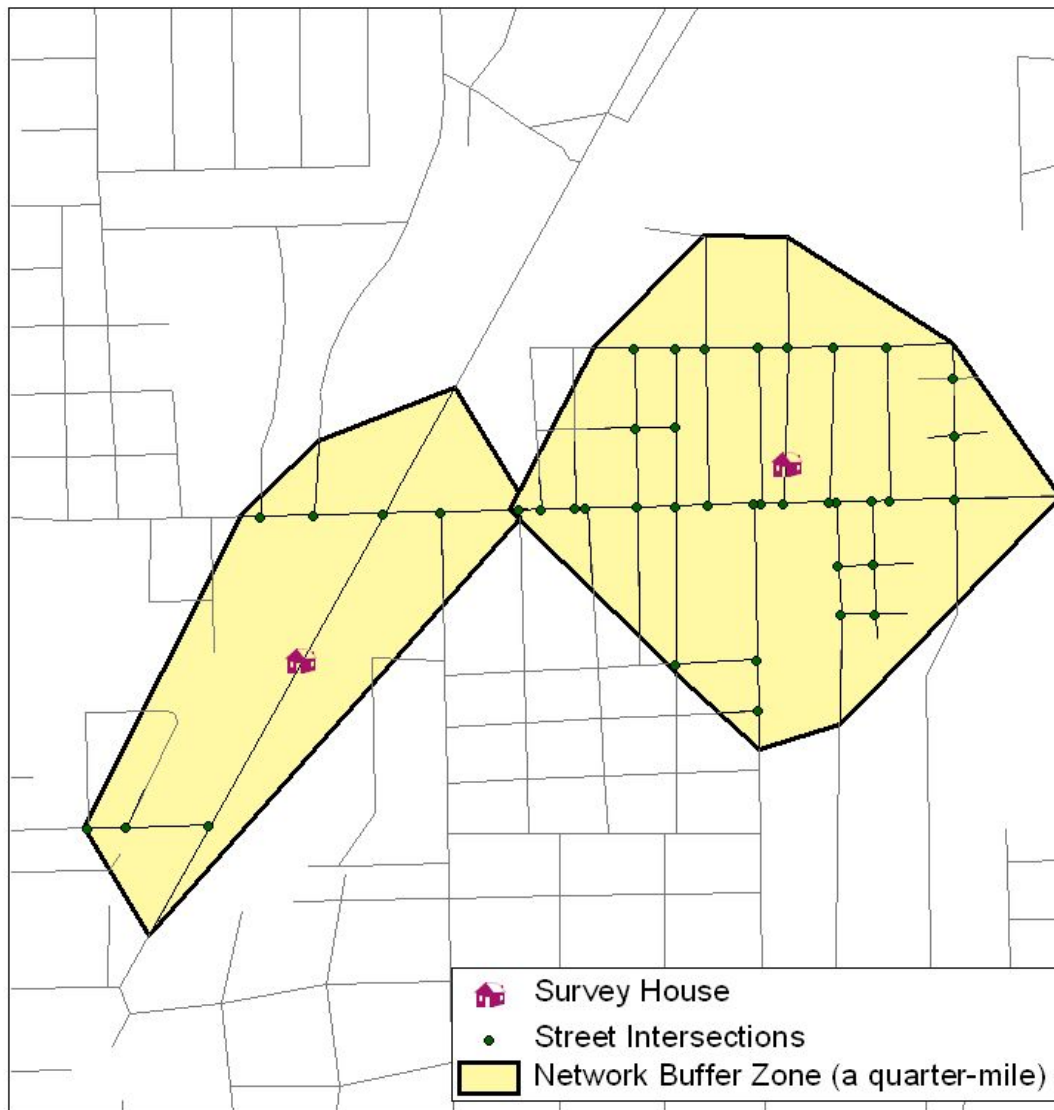
Constructs & Measures

Independent Variable(s)

d.   <u>Demographic Characteristics:</u>

    age, race, marital status, education, household size, number of children, age of youngest child, etc.

e.   <u>Perceptions of Community</u>

    sense of community, fear of crime

Constructs & Measures

Dependent Variable

<u>Physical Activity</u>

- Accusplit 170 Digiwalker2 pedometers
- Steps per Week

Cross-Sectional Analyses:

1. <u>What predicts Physical Activity (PA)?</u>

<u>*Pre-move*</u>:
- *Town predicts PA (Town B walks least; Town C walks most)*

- *Age of youngest child predicts PA (The younger their youngest child is, the more the women walk).*

- *sense of community correlated with age of youngest child*

- *grid neighborhoods – those with more 3-way & 4-way intersections – also correlated w/ age of youngest child*

Pre-Move Steps per Week as Measured by Accusplit Pedometers, by Town

Town	Pre-Move Steps / Week			Post-Move Neighborhood Design
	Mean	**sd**	**N**	
A	43,747	(12,974)	10	Suburban
B	37,165	(24,579)	25	Neotraditional
C	57,798	(38,086)	12	Suburban
D	43,479	(23,273)	20	Neotraditional

Longitudinal
2. Does PA change after move to neotraditional or suburban neighborhood?

Towns	n	Post-Move Design	Pre-Move Steps / Wk Mean sd	Post-Move Steps / Wk Mean sd	
A & C	15	Suburban	55,167 (34,084)	59,323 (26,665)	$t(14) = .57$ $p=.58$ [3]
B	16	Neotrad.	36,775 (23,648)	32,942 (17,344)	$t(15) = .72$ $p=.48$ [4]

$t(29)=1.76$ $p=.09$ [1] $t(29)=3.29$, $p=.003$ [2]

1. **Pre-move, A&C already walk more than those who will move to neo-trad. (B)**

2. **Post-move, this group (A&C) still walks more than group B, who moved to neo-trad.**

3. **No significant change from pre-move to post-move for suburban movers (A &C)**
4. **No significant change from pre-move to post-move for those who move to neo-trad (B)**

Longitudinal --

3. <u>Do neighborhood design or demographic factors predict change in PA?</u>

- ***<u>Post-Move</u>:***

  - ***Pre-move PA predicts post-move PA***

  - *No evidence that neighborhood design predict PA*

 - ***Household size predicts PA***

Conclusions:

Preliminary results suggest:

- Age of youngest child predicts PA
- Some suggestion that grid street network & sense of community play a role

- Household size predicts PA – women from larger households are more active

- Neighborhood design features do not impact PA in this sample
- Moreover, individuals who moved to neotraditional neighborhoods did not increase their PA post-move

However:

May not be a quintessential example of neotraditional

More data (Town D) forthcoming…

Future Directions:
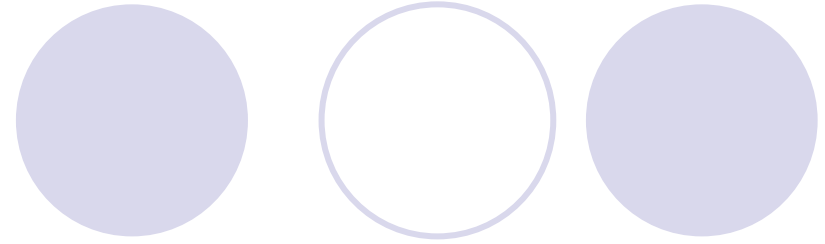
What environmental characteristics matter for whom?

Built Environment ➔ Physical Activity

⬆

Ethnicity, age, location

What mechanism / processes explain connections between the built environment and physical activity?

Built Environment ➔ ? ➔ Physical Activity

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