IMPACT OF THE BUILT ENVIRONMENT ON YOUTH PHYISCAL ACTIVITY AND OBESTIY

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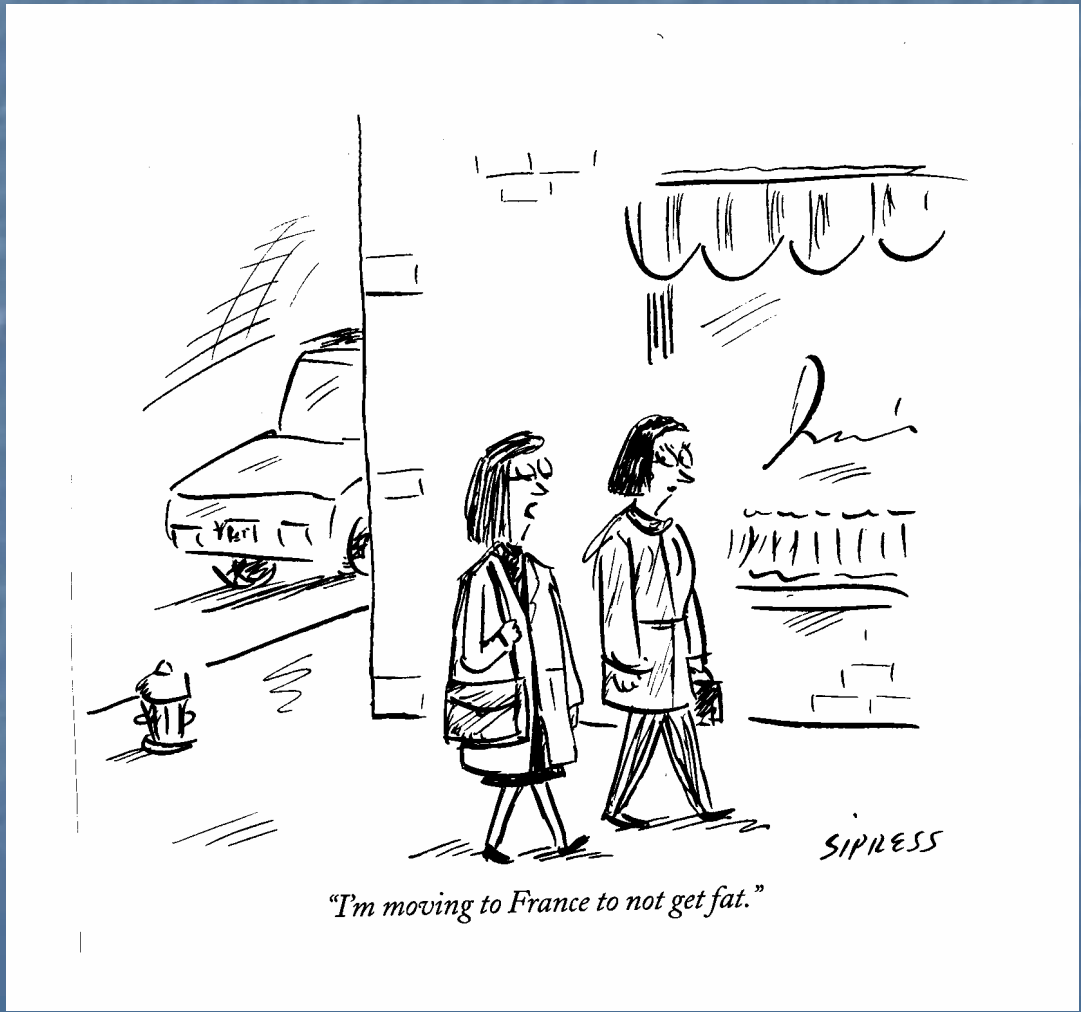
What is the ‘Built Environment’?

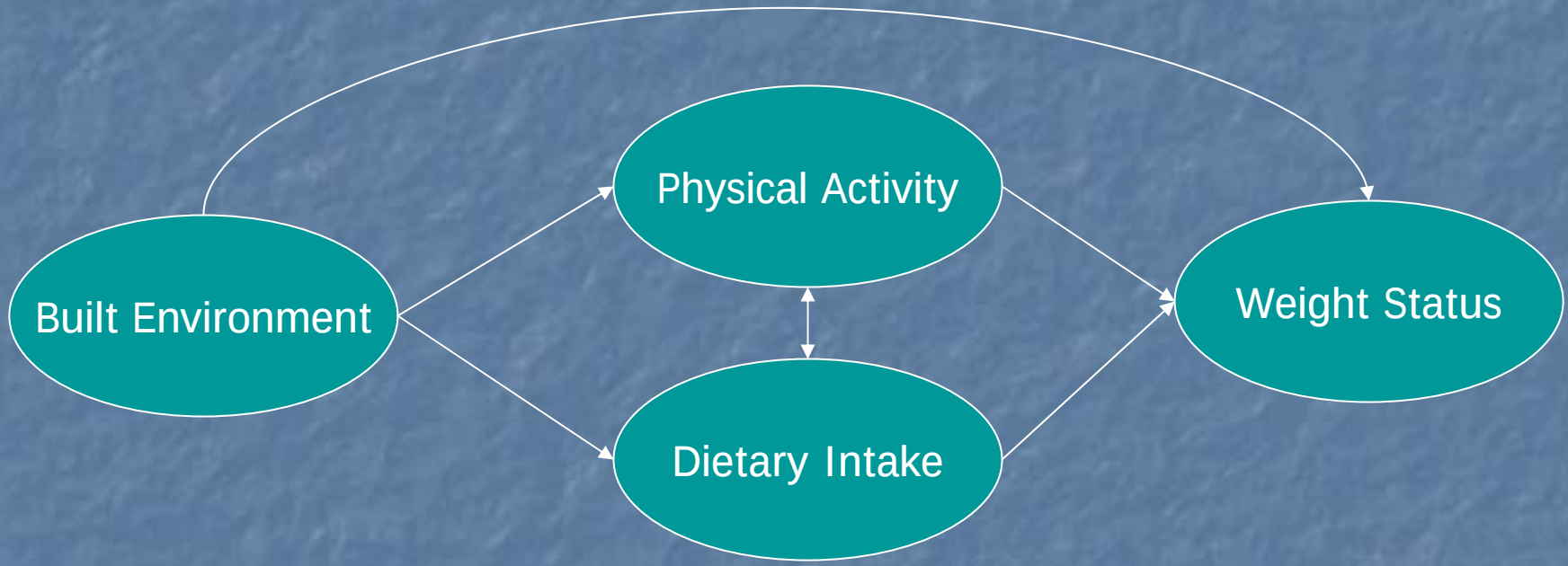
- Built Environment - Community Design
  - Land Use
  - Transportation system – connectivity
  - Design – aesthetic qualities
- Physical Environment = built + natural landscape

How does the built environment affect weight status?

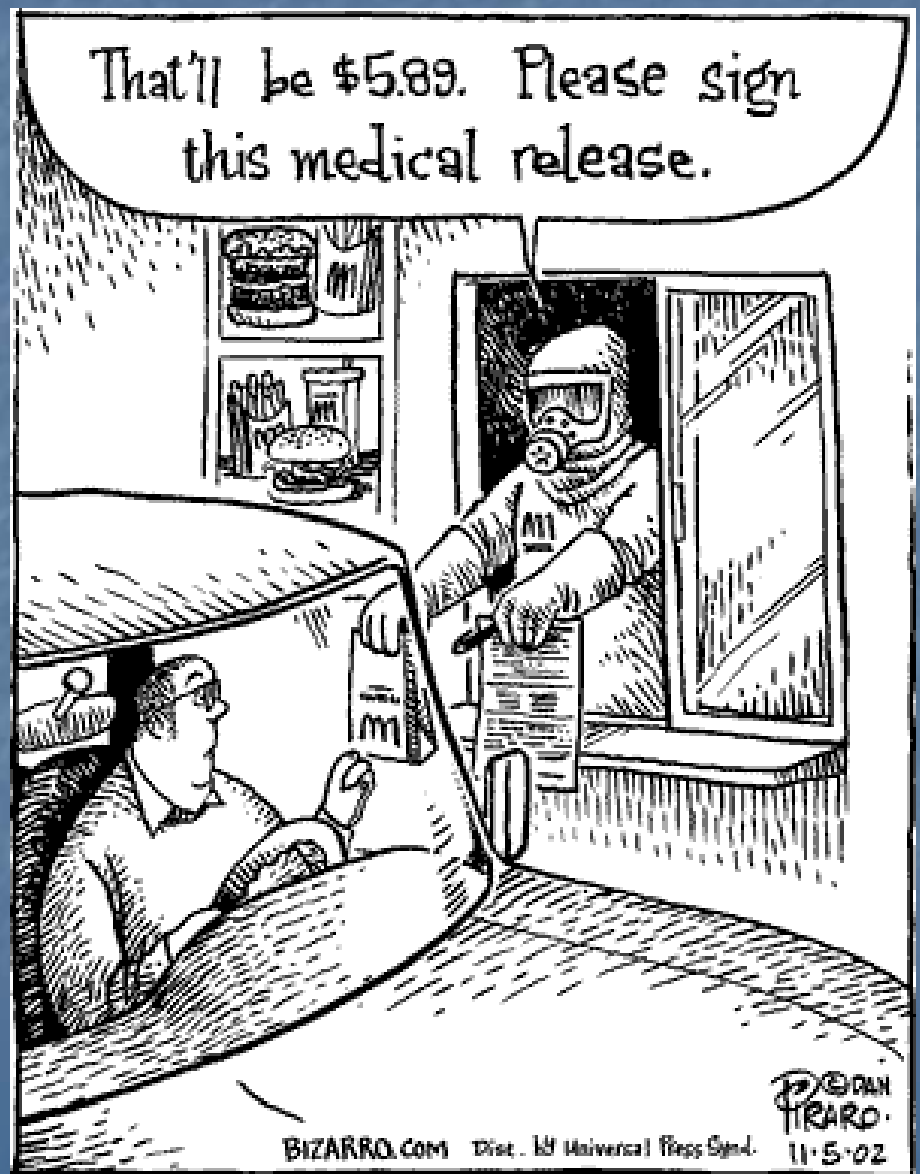


"I'm moving to France to not get fat."

Conceptual Model



Built Environment and Diet



Evidence for Adults

- Community design variables related to adult moderate activity levels (Frank et al., 2005).
- County sprawl index associated with minutes walked, obesity, and hypertension (Ewing et al., 2003).
- Transportation and recreational activity related to neighborhood aesthetics (Hoehner et al., 2005).

Gathering Evidence for Youth

- Kligerman, M, Sallis, JF, Ryan, S, Frank, LD, & Nader, PR. *Association of neighborhood design and recreational environment variables with physical activity and body mass index in adolescents*

- Norman, GJ, Nutter, SK, Ryan, S, Sallis, JF, Calfas, KJ & Patrick, K. *Community design and recreational environment correlates of adolescent physical activity and body mass index*

Common Methods

- Accelerometer measures of physical activity (worn for 7-days)
- Geographic Information Systems used to create environmental variables

Neighborhood Buffer

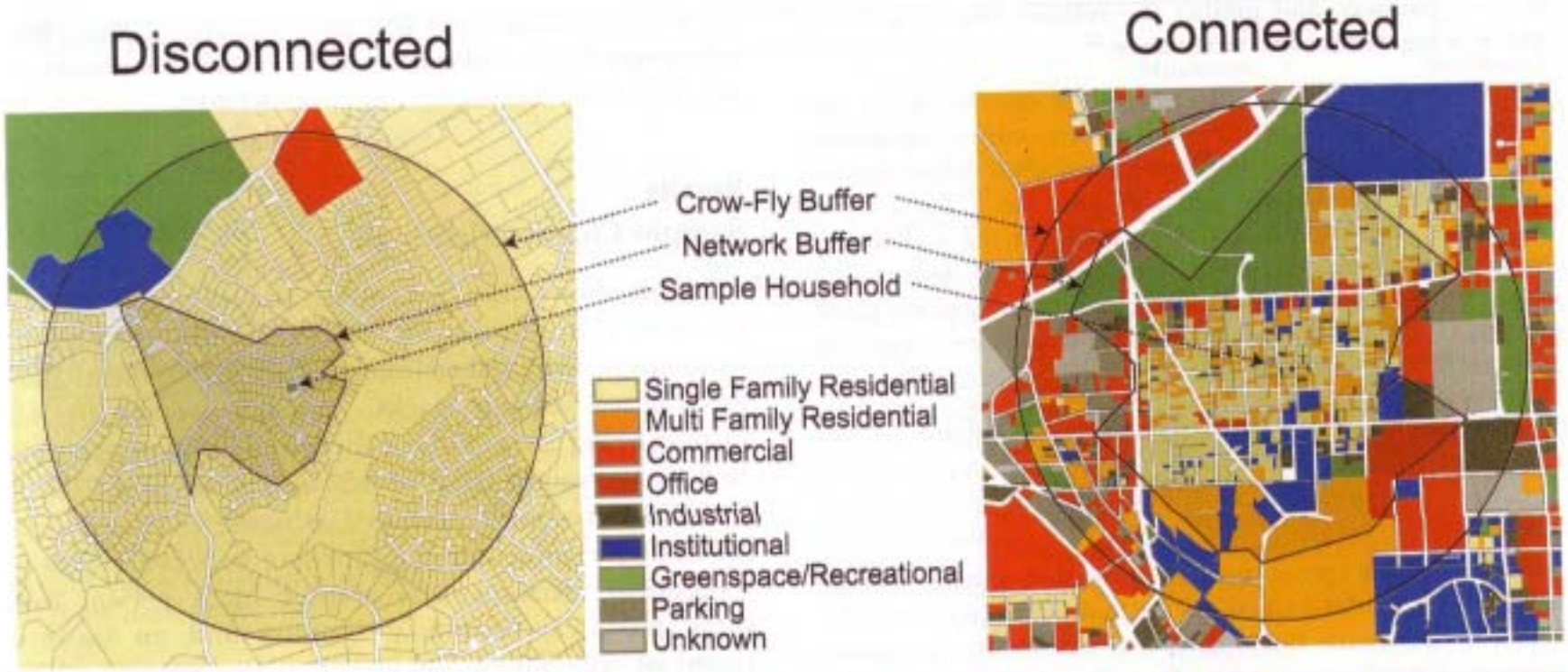


Figure 1. Disconnected and connected community environments.

From: Frank, LD, Andresen, MA, Schmid. (2004) *American Journal of Preventive Medicine*.

Walkability Index

- How walkable is a neighborhood?
  - Land use mix
  - Retail floor area ratio (retail density)
  - Intersection density
  - Residential density

Study 1

- Cross-sectional design
- San Diego County
- 98 participants (mean age 16.3)
- .5 mile buffer

Variables

- Physical Activity
  - Minutes of moderate to vigorous activity
- BMI (weight to height ratio)
- Built Environment (12 variables)

Results

- Walkability index related to physical activity
  - r = .29 (p = .004)
  - Adjusting for gender and ethnicity (beta = .278, partial correlation = .268)
- No relationships found for BMI

Study 2

- Cross-sectional design
- San Diego County
- 799 participants (425 girls, 374 boys, 11-15, mean age 12.8, 43% ethnic minority)
- 1 mile buffer

Variables

- Physical Activity
  - Minutes of moderate to vigorous activity
- BMI percentile (age and gender normed)
- Built Environment
  - Residential density, intersection density, Retail-FAR, Land use mix, Walkability index
  - # private recreation facilities, # schools, # parks

Results

Physical Activity*	Beta	p-value
Girls		
Number of private rec facilities	.110	.016
Intersection density	-.127	.006
Boys		
Retail floor area ratio	.135	.007

Weight Status — No relationships found for BMI

* Multiple regression models controlling for age, ethnicity (non-white), highest household education level.

Summary

- Some evidence that built environment related to youth physical activity
- Variables explained small amounts of variance in physical activity
- Inverse relationship between girls' activity levels and street connectivity
- No evidence of relationship between built environment and weight status

Study Limitations

- Cross-sectional designs
- Did not separate transportation activity from leisure activity
- Relatively wide age range of adolescents
- Limited variation of environments

Implications

- Studies represent early investigations of a complex issue
- Further refinement of measures needed
- Only looked at proximity of environment factors
- Need to consider other environment factors
- Need to consider relationship between built environment and perceived environment