The Non-structural Context of the Neighborhood & Active Commuting

Casey P. Durand, MPH
University of Southern California
Background

- Much existing built environment research focuses on “structural” features of the neighborhood
  - Sidewalks
  - Street connectivity
  - Housing/retail density and availability
- Evidence exists for correlations between structural features and physical activity in adults & children.
Background

- Why the focus on structural features?
- They are potentially modifiable through programs & policy mechanisms
  - Require sidewalks in new developments
  - Incentives for greater density and land use mix
  - Safe Routes to School
Background

- Less focus has been on “non-structural” features, i.e. those that cannot be directly changed through a policy mandate.
  - Neighborhood disorder (aesthetics)
  - The social context (social cohesion & interaction, collective efficacy, etc.)
  - Crime-significant disagreement about the impact of this, especially with children.

- How to change these?
Additional issue: Perceived and objective measures may not be assessing same thing
  ◦ Lack of agreement between the two types of measures has been found

How do these two measurement domains interact to impact physical activity?
Research Questions

- Are parent perceptions of crime, aesthetics and social interactions associated with active commuting to school by their children?
- Do these effects (if any) vary by the objective reality of the neighborhood?

Hypothesis:

- More positive perceptions of the neighborhood will be positively associated with active commuting, and this effect will be stronger for residents of the smart growth community.
Methods

- **Parent Study**
  - Healthy PLACES trial

- **Design**
  - 3 groups: Smart growth community residents, randomized control & demographically matched control. Four waves of data collection; data presented are from baseline year.

- **Participants**
  - 365 families-one parent and one 4th-8th child
  - 85 reside in Smart Growth community
Measures

- Neighborhood Environment Walkability Scale used to assess perceptions of neighborhood
  - Reported by parents on 4 point “strongly disagree”-”strongly agree” scale.
  - Crime (3-item average)
    • High crime rate in my neighborhood
    • Unsafe to go on walks during night/day
  - Aesthetics (6-item average)
    • Neighborhood is free from litter
    • Many attractive natural sights
  - Social interaction (single item)
    • I see and speak to others in my neighborhood
Measures

- Active commuting assessed by asking children how they typically get to and from school.
- Choices were walk, bike, skate, car or bus.
- Demographic variables, e.g. age, ethnicity, gender & free/reduced price lunch (marker for SES) reported by children.
Analysis

- Outcome dichotomized to active commute (walk, bike, skate) or not.
- Logistic regression used to model each factor individually.
- All models control for child age, gender, race/ethnicity, SES, community of residence dummy variable, and proximity to school.
Results

- Significant interaction between perceived crime and community, and aesthetics and community.
  - Factors positively related to active commuting in smart growth community only.
- Social interaction positively associated with active commuting, regardless of group.
## Results

<table>
<thead>
<tr>
<th>Factor</th>
<th>Community of Residence</th>
<th>Odds Ratio for Active Commuting</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime</td>
<td>Conventional</td>
<td>1.06</td>
<td>0.74-1.53</td>
</tr>
<tr>
<td></td>
<td>Smart Growth</td>
<td>0.19*</td>
<td>0.04-0.85</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>Conventional</td>
<td>1.46</td>
<td>0.93-2.29</td>
</tr>
<tr>
<td></td>
<td>Smart Growth</td>
<td>2.91**</td>
<td>1.31-6.46</td>
</tr>
<tr>
<td>Social Interaction$^3$</td>
<td>Combined</td>
<td>1.03**</td>
<td>1.01-1.04</td>
</tr>
</tbody>
</table>

Control for: child age, gender, race/ethnicity, SES, community of residence dummy variable, and proximity to school

*p<0.05; **p<0.01
Results

Graph of cubic social interaction term
Conclusions

- Significant relationships exist between perceived non-structural features of the neighborhood and active commuting in children.
- Some of these associations depend on objective neighborhood type.
- Negative perceptions may negate benefit of structural features.
Conclusions

- Implications for evaluation of structural features:
  - Should account for other features that may “override” positive benefit of available infrastructure.
  - Understand extent to which some perceptions (e.g. crime) are distortions of reality. Important to assess both subj. and obj.
  - Issues of measuring features with no natural objective analogue.
Conclusions

- Implications for interventions/policy:
  - Positive upstream factors may be necessary pre-condition before intervening environmentally.
  - Possible that some benefit to non-structural aspects is derived from structural features
    - Aesthetics, social control
    - Some aspects may create a “natural surveillance” environment. More research is needed.
  - Educational/awareness campaigns for those with mismatched perceptions.
  - Opportunities for parent education component of walk-to-school programs.
References