The Influence of Park Conditions and Supporting Features on Park-Based Physical Activity

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Background

• Relationships between parks and physical activity (Cohen, 2006; Frank, 2007; Kaczynski, 2007)

• More recent focus on park-based physical activity (PBPA) (Cohen, 2007; Floyd, 2008a; Floyd, 2008b; Kaczynski, 2008; Shores, 2008)

• Less work on specific characteristics of parks associated with PBPA (Floyd, 2008b; Shores, 2008; Kaczynski, 2008; Shores, 2010)

• Data analysis can be methodologically challenging
Rationale

• Do we want to bring more people to parks?

• Do we want the people who are already in parks to be more physically active?

• Do we want to maximize park areas to achieve both?
Study Objective

• To describe the impact on park-based physical activity (PBPA) of:
  – Type of activity area
  – Condition of activity area
  – Presence of supporting features
Park-Based Physical Activity (Outcome)

- **Number of Park Users** (total count of visitors observed in a daily aggregated scan).

- **Mean Estimated Energy Expenditure** (average for each observed person in daily aggregated scans, kcal/kg/min).

- **Total (3-hour) Estimated Energy Expenditure** (total over 3-hour time period within daily aggregated scans, kcal/kg).
Independent Variables

- **Type of Activity Area** (basketball court, sports field, green space, path, playground).

- **Condition of Activity Area** (average of items related to area-specific conditions, measured on scale of 1 to 5, then dichotomized into « poor » vs. « good »).

- **Supporting Features Present in Activity Area** (shelters, restrooms, drinking fountains, bike racks, benches, picnic tables).

- **Gender**

- **Day of Week**
Park Sample

Parks by Activity Area Type
37 Neighborhood Parks (113 Activity Areas)

Mean size: 2.9 acres
(SD 2.4, range 0.2-8.6)

Type of Activity Areas Present

- Basketball Courts: 25
- Sports Fields: 23
- Green Space: 28
- Paths: 9
- Playgrounds: 27

Number of Parks
Instruments

• **BRAT-DO** *(Bedimo-Rung, 2006)*
  – Audit of park environmental features that may be associated with physical activity

• **SOPARC** *(McKenzie, 2006)*
  – Observations of park-based physical activity (PBPA)
  – Counts of park visitors
  – Counts of « sedentary », « walking », & « vigorous » park visitors
Assessments

- Summer 2008 (June – August)
- Mondays through Thursdays
- Park audits conducted once per park (between 3 and 4 pm)
- PBPA observations conducted 2 to 4 days per park (between 4 and 7 pm)
- All assessments done on non-holidays with no inclement weather
Unit of Analysis

N=418 daily aggregated scans where at least one person was present.
Analysis

• Multilevel (mixed model) analyses
  – Generalized linear mixed models (number of park users)
  – Linear mixed models (mean energy expenditure and log-transformed total energy expenditure)

• Control for non-independence (clustering) of observations at the level of activity area and park
Independent Effect of Type of Activity Area on Park-Based Physical Activity
Type of Activity Area is associated with number of park users, total energy expenditure, and mean energy expenditure.
Independent Effect of Condition on Park-Based Physical Activity
Condition of Activity Area is associated with number of Basketball Court users, and inversely associated with number of Green Space users.
Condition is not associated with mean energy expenditure in any Activity Area.
Condition is inversely associated with total energy expenditure in Green Spaces.
Independent Effect of Supporting Features on Park-Based Physical Activity
Restrooms and drinking fountains are associated with greater numbers of park users.
No supporting features are associated with mean energy expenditure.
Restrooms and drinking fountains are associated with total (3-hr) energy expenditure.
Summary

- Type of Activity Area is associated with PBPA

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<thead>
<tr>
<th></th>
<th>Fewer people</th>
<th>More people</th>
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</thead>
<tbody>
<tr>
<td><strong>Less active</strong></td>
<td>green space</td>
<td>sports fields</td>
</tr>
<tr>
<td><strong>More active</strong></td>
<td>playgrounds, paths</td>
<td>basketball courts</td>
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</tbody>
</table>
Summary

• Better Activity Area condition is associated with some PBPA outcomes:
  – Greater numbers of basketball court users
  – Fewer numbers of green spacer users and less total energy expenditure in green space

• Condition NOT associated with:
  – Mean energy expenditure
Summary

- Some supporting features associated with PBPA:
  - Number of park users: restrooms, drinking fountains
  - Total (3-hr) energy expenditure: restrooms, drinking fountains

- No supporting features associated with mean energy expenditure
Implications

• Park planners should consider their goals and target audiences when allocating resources for individual activity areas.

• Condition and Supporting features do not appear to be related to physical activity levels, but they are related to number of park visitors.
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References


