Parks, Physical Activity, and Chronic Disease: A Research Agenda

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Physical Activity Research in Community Settings (PARCS) Lab

Children’s Mercy Hospital – December 14th, 2017
Just a bit about Gina ...

- BS in Kinesiology and MPH from Kansas State University, PhD from Arnold School of Public Health
- Previously Assistant Professor Public Health Augusta University
- Assistant Professor Department of Kinesiology at Kansas State University
- Director, Physical Activity Research in Community Settings (PARCS) Lab bit.ly/PARCSLab
- Research: built environment and health, with an emphasis on parks, physical activity, and chronic disease
- Interested in advancing innovative technology and infrastructure to improve community health
Agenda for Today

- Role of Parks in PA and Health Promotion
- Measuring Park Environments
- Technology and Infrastructure for Park Advocacy and Health Promotion
- Park/PA Interventions
- Future Directions
what goes into your health?

- **Socioeconomic Factors**
  - Education
  - Job Status
  - Family/Social Support
  - Income
  - Community Safety

- **Physical Environment**

- **Health Behaviors**
  - Tobacco Use
  - Diet & Exercise
  - Alcohol Use
  - Sexual Activity

- **Health Care**
  - Access to Care
  - Quality of Care

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Education influences where you work.

Income affects your housing, where you go to school, etc.

Environment can impede or support PA behavior.
Parks, Physical Activity, and Chronic Disease

Source: Sallis et al. (2006)

Active Recreation
- Recreation Environments
  - Parks & Trails
  - Community Organizations
  - Sports
- Neighborhood
  - Ped/bike facilities
  - Aesthetics
  - Traffic Safety
- Policies/transportation
- Health care (incentives)
Parks and Physical Activity

- Beyond community benefits (economic, environmental) parks offer numerous physical, psychological, and social benefits

- Parks specifically have been viewed as potential settings to increase PA levels
  - Legislated
  - Low cost
  - Ability to reach large numbers
  - Approximately 80% of Americans use services provided by local parks and recreation departments

- Time spent outdoors is a consistent positive determinant of PA
Role of parks in PA & health promotion
Overview of Parks and Physical Activity Research

• Living closer to park space is associated with increased PA among adults & youth

• Park characteristics associated with PA
  • Size/area/number
  • Accessibility (connectedness)
  • Number and types of features (playgrounds, trails, sports fields, etc) and amenities (bathrooms, benches)
  • Quality (cleanliness, graffiti, equipment)
  • Safety

• Park availability, features, and quality are generally worse in low income and/or high-minority areas
• Explored the spatial relationship between park availability and incidence of chronic health concerns (CHCs) across age groups in Kansas City, Missouri (KCMO).

• Among respondents ages 40-59, those **without** a park within ½ mile from home were more than **twice as likely** to have 2+ CHCs compared to those that had a park nearby (OR=2.28, CI=1.05-4.94).

• Parks may be an important **protective factor** for chronic diseases, especially among middle-aged adults who are still mobile but at risk for onset of CHCs.

• Similar to previous research indicating park users reported fewer visits to a physician

Role of parks in PA & health promotion

Measurement and Advocacy

Health
**Purpose:** To develop a tool that will enable diverse stakeholders to quickly and reliably audit community parks for their potential to promote physical activity
Development of the Community Park Audit Tool (CPAT)

- Kansas City, Missouri
- 34 diverse stakeholders
  - 3 workshops
- Field testing in 59 parks
- 6 pages with 4 sections:
  - Park Information
  - Access and Surrounding Neighborhood
  - Park Activity Areas
  - Park Quality and Safety

CPAT Inter-rater Reliability

- Reliability of 10 items could not be assessed due to less than three pairs of ratings

- Vast majority of the items had acceptable kappas and/or percent agreement

<table>
<thead>
<tr>
<th>Kappa Value</th>
<th># of items</th>
<th># of items in row with % agreement &gt; 70%</th>
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<tr>
<td>Not available/applicable</td>
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<td>55</td>
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<tr>
<td>0.60 or above</td>
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<td>13</td>
<td>12</td>
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<td>Less than 0.40</td>
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<td>6</td>
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</table>

- Is there an app for that?

Development and testing of mobile technology for community park improvements: validity and reliability of the eCPAT application with youth

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Abstract
Creation of mobile technology environmental audit tools can provide a more interactive way for youth to engage with communities and facilitate participation in health promotion efforts. This study describes the development and validity and reliability testing of an electronic version of the Community Park Audit Tool (eCPAT). eCPAT consists of 149 items and incorporates a variety of technology benefits. Criterion-related validity and inter-rater reliability were evaluated using data from 52 youth across 47 parks in Greenville County, SC. A large portion of items (97%) demonstrated either fair or moderate to perfect validity and reliability. All but six items demonstrated excellent percent agreement. The eCPAT app is a user-friendly tool that provides a comprehensive assessment of park environments. Given the proliferation of smartphones, tablets, and other electronic devices among both adolescents and adults, the eCPAT app has potential to

Implications
The eCPAT application is valid and reliable for use with youth populations.

Youth can make valuable contributions within participatory action research processes for community health promotion.

The eCPAT app is a useful tool that has potential to be distributed and used widely by the general public.

The eCPAT app has potential to be incorporated into Park Prescriptions or similar initiatives to improve community awareness of park features and attributes in an effort to increase park-based PA.
eCPAT – Objectives

• To develop and test an electronic version of the Community Park Audit Tool (eCPAT) for use by youth and the general public on portable electronic devices

• To examine the acceptability, feasibility, and efficacy of mobile technology to engage youth in healthy community policy, system, and environmental change efforts
eCPAT Development Stages

- Literature review
- Key informant interviews
- Systems requirement analysis
- Application software design
- Program coding
- Alpha (capacity) testing
- Database development

Data collection on Mobile Device + App

Server for data analysis
Parks, Physical Activity, and Chronic Disease

**IMPORTANT AUDITING TIPS**

- Drive, bike, or walk around the park to get a feel for what's in the park and the neighborhood around the park.

- The eCPAT questions are grouped in sections in the order that you might come across them in a park. However, you may need to switch between sections as you complete your park audit. Therefore, it is important to look through the tool before you begin.

- When you are finished, go back and make sure you have completed all the sections and questions.

- There is space at the end of each section where you can type comments as you complete your audit.

- Also, use the legend to the right to identify the various icons in the eCPAT and their uses.

- If you see anything that requires immediate attention, contact the local parks department.

**Legend**

- Complete Section
- Incomplete Section
- View More Information
- View Picture Example
- Take Photo
- Return to Home
- Administrative

**Access and Neighborhood**

**Instructions**

This section asks about accessing the park and the neighborhood surrounding the park. Several questions include follow-up responses if you answered yes. There are spaces for comments at the end of the section. When thinking about the surrounding neighborhood, consider all areas that you can see from inside of the park.

When rating the access and surrounding neighborhood, please use the following definition:

- **Usable**: everything necessary for use is present and nothing prevents use (e.g., sidewalks are passable).

**Access**

- **Usable**

**Park Signs**

- **Usable**

**Entry points**

- **Usable**

**Public Transit**

- **Usable**

**Parking Types**

- **Usable**

**Sidewalks**

- **Usable**

**Weather**

- **Usable**
• 47 parks – diverse mix of quality, size, features, and geographic dispersion

• Youth ages 11-18
  • 19 youth beta testing phase
  • 124 youth completed testing the eCPAT app in Greenville area parks

• Youth audited 2 parks each and completed surveys and focus groups
eCPAT – Results

- **Criterion validity** analysis compared youth eCPAT audit to gold standard eCPAT audit.
- **Inter-rater reliability** analysis compared youth eCPAT auditor 1 to youth eCPAT auditor 2.
- 90 items examined using Cohen’s kappa.
- 41 items examined using percent agreement.

**Validity**
- 40% of items had moderate to perfect kappas.
- All but 2 items had excellent percent agreement.

**Reliability**
- 41% of items had moderate to perfect kappas.
- All but 4 items had excellent percent agreement.
- Items with lower scores tended to be more subjective, temporal, or abstract.
### eCPAT – Preliminary Findings

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<tr>
<th>Preference Dimensions</th>
<th>Paper CPAT</th>
<th>eCPAT app</th>
<th>I liked both equally</th>
<th>I didn’t like either</th>
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<td>Which format was easier to use?</td>
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<td>71.0</td>
<td>16.9</td>
<td>3.2</td>
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<td>Which format did you enjoy using the most?</td>
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<td>80.6</td>
<td>9.7</td>
<td>3.2</td>
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<td>Which format would you want to use in future projects?</td>
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</table>

- eCPAT selected as easier, most enjoyable, best liked, and preferred format for future projects
Electronic Community Park Audit Tool Mobile Application (eCPAT)

- Addresses needs related to:
  - Few audit tools developed specifically for youth
  - Youth PAR technology needed
  - Unique opportunity to combine multiple technologies (photography, GIS, mobile interface) into a single user-friendly tool that is useful to multiple stakeholders
“We actually care and we want to make the parks better”: A qualitative study of youth experiences and perceptions after conducting park audits

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eCPAT – Summary

- eCPAT app also has potential to be distributed and used widely by researchers, professionals, and the general public.

- Need to further develop and eCPAT system.
Parks, Physical Activity, and Chronic Disease

- Role of parks in PA & health promotion
- Technology & Infrastructure
- Measure park & NH environments

Health
eCPAT System

1. Mobile app for Park Auditors
2. Central Server, Database, & Middleware Application
3. Public Web Interface: Search, Map, Compare, Rate Parks
4. Park Industry Client Web Interface: Add, Edit, Download, and Analyze Audit Data
5. Commercial Client Web Interface: Industry and User Specific Park Data and Reports
### My Profile

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</table>

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eCPAT Park Search

Search your local area for parks and recreation areas near you.

Select Search Radius: • 1 mile • 3 miles • 5 miles

Address or Zip Code
Implications and Future Directions

- Engage community stakeholders in testing and refining the website
- Develop a mobile friendly version of the web-page
- Engage physicians and healthcare providers
- Incorporate into electronic health records to support Park Prescription programs
Implications and Future Directions

- Park Rx Provider Survey
  - Understand current provider knowledge and practice for PA counseling
  - Gauge interest to develop/support local Park Rx Programming
  - Understand facilitators and barriers
Parks, Physical Activity, and Chronic Disease

Role of parks in PA & health promotion

Technology & Infrastructure

Measure park environments

Park PA Interventions

Health
Future Directions in Parks, Physical Activity, and Chronic Disease

• Park Prescriptions

  • Regular PA can help children maintain a healthy weight and reduce risk of chronic disease

  • Partner with local providers to prescribe park-based PA

  • Use quick text function in EHR – Link to eCPAT data - Allows prescription of a park

  • Pre/Post assessment of weight/BMI, fitness
    Wearable devices to track PA
      • eCPAT mobile website can help track park visits to send to physicians (check-in function)
Future Directions in Parks, Physical Activity, and Chronic Disease

• Youth Engagement for Community PA Resources

• Reduce disparities in youth PA and health outcomes through engagement in community policy, systems, and environmental change

• Based on award-winning HYPE curriculum developed as part of a CDC community transformation grant

• Youth are engaged in a citizen science process to identify ways to improve PA resources in their community

• Youth-led community changes lead to positive individual and community level outcomes
Acknowledgements
Parks, Physical Activity, and Chronic Disease: Advancing Technology and Infrastructure for Public Health

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