Neighborhood Walkability Perceptions: Associations with Amount of Neighborhood-Based Activity by Intensity and Purpose

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Background

- Increased calls for **specificity** in active living research

- “Rather than using a general model to predict a general behavior (e.g., physical activity overall), the capacity to predict a behavior is enhanced when there is greater correspondence between a specific behavioral outcome measure and the specific environmental behaviors hypothesized to be associated with that behavior” (Giles-Corti et al., 2005, p. 177)

- Most studies of environmental supports for activity continue to examine neighborhood attributes in relation to an **aggregated** measure of PA
  - ignores location and other contextual details
  - likely includes a substantial amount of activity that is unrelated to environmental features
Study Purposes

• To describe the proportion of PA episodes that occur within participants’ neighborhoods relative to other locations

• To examine how neighborhood walkability attributes are associated with the amount and intensity of PA that occurs specifically within neighborhoods

• To investigate which neighborhood attributes are related to PA engaged in within the neighborhood for recreation and transportation
Data Collection

• Four neighborhoods in Waterloo, Ontario

• 585 (of 960; 61%) randomly-selected residents (adults) completed a questionnaire and physical activity log
  • data from 384 individuals from unique households analyzed here

• Neighborhood Environment Walkability Scale (Saelens et al., 2003; Cerin et al., 2006)
  • residential density
  • land use mix-diversity
  • land use mix-access
  • street connectivity
  • walking/cycling facilities
  • aesthetics
  • safety
Data Collection

• 7-day physical activity log booklet with detailed instructions

• For each episode > 10 minutes:
  • Duration – minutes
  • Intensity – mild, moderate, strenuous
  • Purpose – recreation, transportation, household, job-related
  • Location – open ended text coded as:
    • at home
    • in neighborhood (whole or part)
    • in another location

• 3815 total episodes
  • 1.7% unclassifiable
  • neighborhood episodes determined on a case by case basis according to municipal planning district boundaries
Analyses

• Descriptive data on the proportion of PA episodes that occurred at home, in the neighborhood, or in another location

• Multivariate analysis of covariance controlling for age, gender, injury
  • **Level of neighborhood PA** – three groups: 0 vs. 1-59 vs. 60+ min
  • separate models for mild, moderate, strenuous neighborhood PA
  • **Level of recreational PA** – 0 vs. 1+ minutes
  • **Amount of transportation PA** – 0 vs. 1+ minutes

• Scores on 7 NEWS dimensions used as dependent variables to see how perceptions of neighborhood attributes differed across activity groups
Results

- Purpose 1: To describe the proportion of PA episodes that occur within participants’ neighborhoods relative to other locations
  - **32.9% in participant’s neighborhoods**
  - 28.5% at home
  - 38.6% in other contexts (e.g., another area of town, out of town)

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Total Episodes</th>
<th>Neighborhood Number</th>
<th>Neighborhood %</th>
<th>Home Number</th>
<th>Home %</th>
<th>Other Number</th>
<th>Other %</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1: Core</td>
<td>958</td>
<td>386</td>
<td>40.3%</td>
<td>291</td>
<td>30.4%</td>
<td>281</td>
<td>29.3%</td>
</tr>
<tr>
<td>N2: Inner suburb</td>
<td>920</td>
<td>281</td>
<td>30.5%</td>
<td>246</td>
<td>26.7%</td>
<td>393</td>
<td>42.7%</td>
</tr>
<tr>
<td>N3: Inner suburb</td>
<td>1083</td>
<td>334</td>
<td>30.8%</td>
<td>308</td>
<td>28.4%</td>
<td>441</td>
<td>40.7%</td>
</tr>
<tr>
<td>N4: Outer suburb</td>
<td>789</td>
<td>234</td>
<td>29.7%</td>
<td>222</td>
<td>28.1%</td>
<td>333</td>
<td>42.2%</td>
</tr>
<tr>
<td>Total (study sample)</td>
<td>3750</td>
<td>1235</td>
<td><strong>32.9%</strong></td>
<td>1067</td>
<td><strong>28.5%</strong></td>
<td>1448</td>
<td><strong>38.6%</strong></td>
</tr>
</tbody>
</table>
Results

- **Purpose 2**: To examine how neighborhood walkability attributes are associated with the **amount** and **intensity** of PA that occurs specifically within n’hoods.

- Ratings of seven NEWS variables not different when examining mild and strenuous activity groups.

- Participants engaging in no moderate neighborhood PA had significantly lower ratings (*) for 5 of 7 attributes compared to those engaging in 1-59 or 60+ minutes.
Results

• Purpose 3: To investigate which neighborhood attributes are related to PA engaged in within the neighborhood for transportation and recreation

• Participants engaging in at least some transportation-related PA (1+ min) had more positive perceptions of land use mix-access, aesthetics, and street connectivity

• Participants engaging in at least some recreational PA (1+ min) had higher ratings for only aesthetics
Conclusions

- Context of physical activity (location, activity, purpose) should be considered when drawing associations with neighborhood environments.

- A more walkable neighborhood may be a trigger for PA, but other factors (e.g., self-efficacy, family duties) may better explain amount of neighborhood PA.

- Nagel et al. (2008) – BE not a significant factor in whether older adults walk, but associated with increased activity levels among those who do walk.

- Greenberg et al. (2005) – more than ½ of Black respondents reporting no outdoor exercise would increase activity by 10+ minutes if walkability improved, compared to ¼ of White respondents.

- Van Dyck et al. (2009) - living in a high walkable neighborhood associated with taking more steps in adults with a preference for passive transport.

- Forsyth et al. (2008) – only less healthy persons walked more overall in high density areas after controlling for sociodemographic characteristics.
Conclusions

- Greatest gains in PA promotion may come from stimulating the bulging group of largely sedentary persons to initiate some activity (Blair et al., 2004; USDHHS, 1996)

- Different attributes are associated with transportation-related and recreational neighborhood PA
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