Walkability Interventions
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Walking is easy and important, but why still many people do not walk enough?
Conceptualizing **Walkability**

- **Walkability from the socio-ecological perspective**
  (e.g. Bauman et al. 2002)

- **Walkability from the behavioral model of environment**
  (e.g. Lee and Moudon 2004)
  - Origin-Destination
  - Route
  - Area

The Social-Ecological Model: A Framework for Factors of Behavior

The Behavioral Model of the Environment (Figure from Lee 2016)
Environmental Pathways*

<table>
<thead>
<tr>
<th>Main Effect</th>
<th>Walkability</th>
<th>Walking</th>
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<tbody>
<tr>
<td>Mediating Effect</td>
<td>Income</td>
<td>Walkability</td>
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<tr>
<td>Moderating Effect</td>
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<td>Walkability</td>
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- **Walkability** has been widely used to describe how much certain areas provide opportunities to walk (Leyden 2003).

Walkability Benefits

- Walkability has been shown to be associated with health outcomes, such as actual walking behavior, body mass index (BMI), and quality of life (Sallis et al. 2009).

- Walkability is associated with lower prevalence of overweight and obesity, more walking and decreased incidence of diabetes (Frank et al. 2006; Kligerman et al. 2007, Booth et al. 2005, Saelens et al. 2003, Creatore et al. 2016).

- People who lived in the high walkable neighborhoods (e.g. high residential density, street connectivity, public transport density, and more number of parks), walked 68 to 89 minutes more per week than those in the low walkable neighborhoods (Sallis et al. 2016).
In addition to its established link with walking, physical activity and obesity, walkability has also been shown to offer other important benefits such as mental health, social capital, environmental and economic values.

- Greater neighborhood walkability was negatively associated with depressive symptoms in older men (Berke et al. 2007).

- Living in areas with walkable green spaces was positively associated with the longevity of urban senior citizens (Takano et al. 2002).

- Perceived walkability was shown to enhance neighborhood social interaction and sense of community (Jun and Misun, 2015); Walk Score values were positively associated with Community Currency activities (Kwon 2016).

- Walkable neighborhoods was positively associated with property values in more pedestrian-oriented neighborhoods; but negatively in automobile-oriented neighborhoods (Pivo and Fisher 2011).

- Walkable neighborhoods residents had lower transportation costs but higher housing costs (Leinberger and Alfonzo 2012).
Walkability Studies

• Correlational Study
  Built environmental correlates of walking

• Longitudinal Study
  Before and after relocating to a new neighborhood
  Before and after an environmental modification
Walkability Studies

Built environmental correlates of walking

- Residential density
- Proximity to destinations (e.g. food, service, retails, recreation, etc.)
- Land use mix
- Street connectivity
- Sidewalk availability/quality
- Access to transit
- Access to parks, trails and other recreational amenities
- Crime safety, traffic and street-crossing safety
- Visual quality/aesthetics of neighborhood
- Slope/terrain
- And more!
Walkability Interventions

Do people walk more when they move to a more walkable neighborhood?

BEFORE: Less Walkable Neighborhood

AFTER: More Walkable Neighborhood
Walkability Interventions

- In a post-move cross-sectional study, residents in a newly developed walkable community reported more walking, physical activity, and social interactions after the move (Zhu et al. 2014).

- In a post-move cross-sectional study, women who moved to a neighborhood with fewer cul-de-sacs walked more than they had before (Wells and Yang 2008).

- In a prospective study of Black women, those who relocated to a neighborhood with high density increased utilitarian and recreation walking (Coogan et al. 2009).

- In a longitudinal natural experiment, after relocation to a suburban fringe neighborhood with fewer local transport-related destinations but more public open spaces, residents’ transport-related walking declined, while recreational walking increased (Giles-Corti et al. 2013).
Walkability Interventions

The Boston Complete Streets initiative

Is an environmental modification effective in promoting walking?

http://siqizhu.net/projects/complete-streets/
Walkability Interventions

• Walking, cycling, and other physical activity increased after installing greenway trails (Fitzhugh et al., 2010) and street lighting (Painter 1996).

• Improvements in sidewalks or traffic control around schools resulted in higher walk/bike rates among children traveling along the improved route (Boarnet et al. 2005).

• Park improvements led to increases in the first time park users (Cohen et al. 2009).

• A new light rail stop increased ridership, and the riders increased moderate physical activity (Brown and Werner 2007).

• Cyclist activity increased after installing cycling infrastructure (Brown and Werner 2007).
Walkability Issues

• **General Population Characteristics**
  e.g. Children, Adults, Older Adults

• **Measurements of Walkability**
  e.g. Perceived vs. Objective, Macro vs. Micro Scale Measures

• **Variations in Outcome** (e.g. walking, physical activity)
  e.g. Moderate vs. Vigorous PA, Utilitarian vs. Recreational Walking

• **Specific/Special Characteristics of Target Populations**
  e.g. Non-Walkers vs. Insufficient Walkers, High-Risk Groups, Special Populations

• **Different Characteristics of Neighborhood Environment**
  e.g. Urban vs. Rural, High vs. Low income Neighborhoods
Built environmental (BE) interventions are different from other interventions in that they can influence a large number of people at a time, but the magnitude of impact on each individual may be relatively small and unequal.

The effect of BE interventions may be more sustainable in the long run. BE interventions do not disappear, and tend to target lifestyle activities that are more habitual/sustainable.

The cost, time, and feasibility (in addition to benefits and unexpected consequences) of BE interventions need to be considered carefully. Things like land use changes take a long time while infrastructure interventions such as crosswalks, bike lanes, lighting, and traffic calming devices, may be more feasible.
Considerations for Walkability Interventions

Walkability is a multifaceted concept

• Consider diverse environmental pathways (direct and indirect roles of walkability).

• Consider the impact of various walkability features on walking for recreational and/or utilitarian purposes.

• Consider both the macro level (e.g. density, land use mix) and micro level (e.g. street conditions, infrastructure design) conditions.

• Consider both objective (e.g. audit, Walk Score, GIS) and perceived (e.g. survey, audit) walkability attributes.

• Consider different community settings (e.g. rural, semi-urban, urban, rural), and population characteristics (e.g. different income, age, and ethnic groups, current walking/activity levels, attitudes and preferences, household characteristics).
Discussions

**ACTIVE DESIGN GUIDELINES**

Promoting Physical Activity and Health in Design

Under the guidance of the Brazos Valley Obesity Prevention Network and with administrative support from Brazos Valley Community Action Agency, Inc., UP-BEAT facilitates current and new partner efforts to increase access to physical activity among youth and families in the Brazos Valley.

Thank you for helping make BVCS a healthier place to live!
Discussions

- Design communities that make it safe and easy for people of all ages and abilities to walk.

- Promote programs and policies to support walking where people live, learn, work and play.

- Provide information to encourage walking and improve walkability.

THANK YOU!
SELECTED REFERENCES

Images
[S-6] lancasteronline.com/communitybuilders.net
[S-10] Google Street View image
[S-12] http://siqizhu.net/projects/complete-streets/
http://envisionfrederickcounty.org/americas-walking-renaissance/
http://bvopn.org/up-beat/about-up-beat/

Articles


