Measuring the Built Environment using GIS

Walkability index
- Street Connectivity
- Residential Density
- Land Use – Diversity and Intensity
- Retail Floor Area Ratio

1 Based on index developed by Larry Frank

Overall project aim

- To assess neighbourhood walkability at different scales (suburb, CCD and 15 minute walk level);
- To study the impact of neighbourhood scale on different types of walking

Neighbourhood scale (Learnihan, 2007)

15 minute walk (Learnihan, 2007)

Use of Geographic Information System to assess the impact of ‘neighbourhood’ scale on walking

Data being discussed are unpublished.

Vincent Learnihan
Supervisors: Kimberly Van Niel; Billie Giles-Corti

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Study aim

- To investigate the relationship between urban design factors related to perceived safety and walking in the local neighbourhood

Background

- ‘Neighbourhood safety’ can refer to traffic, unattended dogs, street lighting, infrastructure condition, disorder and crime
- Measurements of subjective crime-related safety focus on judgments about crime rather than emotional responses to crime
- Possible responses to fear of crime: constrained or protective behaviour

Urban design features

- Liveable Neighbourhoods aim to promote safety through activity and surveillance
- Natural surveillance
  - House design (setbacks, porches/verandahs, back alleys, fencing, landscaping)
  - Neighbourhood design (mixed density, houses overlooking POS)
  - Street lighting
  - Walkable neighbourhoods – more surveillance from pedestrian traffic?
Neighbourhood condition

- Physical incivilities (e.g. graffiti, litter, vandalism)
  - Associated with increased crime, fear of crime, perceived crime
- ‘Suburban incivilities’ (e.g. house, garden, lawn maintenance)
  - Indicates place attachment and territoriality

Perceptions

- Questionnaire sent to RESIDE participants
  - Housing design and street surveillance
  - Fear of crime
  - Perceived risk from crime,
  - Local problems, disorder and crime
  - Experiences of victimization
  - Protective and constrained behaviour
  - Collective efficacy

Environmental data

- Objective data
  - RESIDE POST data: surveillance from houses, incivilities, lighting
  - Street audit for surveillance, incivilities, personalisation, maintenance
  - Police crime statistics / newspaper content analysis
  - Street lighting

Developed a Crime Prevention Through Environmental Design (CPTED) index

- Houses with good visibility
- Verandah, porch or balcony
- Low walls, fences, hedges or borders
- No unkempt gardens
- No unkempt front lawns
- No vacant lots

Concluding remarks

- What impact do these features have on actual crime and local walking? Stay tuned…
Improving Mental Health – what role for neighbourhood design?

Jacinta Francis
Supervisors: Billie Giles-Corti; Lisa Wood

The built environment and mental health

• Directly
• Indirectly by altering psychosocial processes with known mental health consequences

Psychosocial processes

• Social networks
• Social support
• Sense of community
• Sense of place

Aim

• To investigate the relationship between the presence, use and design of public places and psychosocial outcomes in residents of new Estates in the Perth metropolitan area.

Methodology

• Focus groups
• Survey of RESIDE participants
• Objective park data
• Content analysis of newspapers

Hypothesis

• Public places that are easy to access, frequently utilized and well designed –→ positive psychosocial outcomes → better mental health.
Increasing physical activity through dog walking.

What role for neighbourhood design?

Hayley Cutt
Supervisors: Billie Giles-Corti; Matthew Knuiman

Background

- Level of dog ownership high
- Health benefits of pet ownership
- Dog owner vs non-owner walking levels
- Social environment and dog walking
- Physical environment and dog walking?

RESIDE baseline survey data
(n=1813; 44% dog owners)

Odds of sufficient PA according to dog ownership and dog walking frequency
(Cutt et al, Am J Public Health 2008)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>% active at recommended level</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>p value</th>
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<tr>
<td>Non-owner</td>
<td>54.1</td>
<td>1.00</td>
<td>Reference</td>
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<tr>
<td>Dog owner</td>
<td>61.2</td>
<td>1.68*</td>
<td>1.26-2.24</td>
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<td>0 walks per week with dog</td>
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<td>0.87</td>
<td>0.56-1.35</td>
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<td>1-4 walks per week with dog</td>
<td>57.1</td>
<td>1.64*</td>
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<td>5+ walks per week with dog</td>
<td>88.1</td>
<td>6.95*</td>
<td>3.41-14.15</td>
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Adjusted for gender, age, country of origin, education, occupation, mean age of children living at home <18 years, type of residence.

The physical environment & dog walking

Correlates of regular dog walking

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<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
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<th>CI</th>
<th>p value</th>
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<tbody>
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<td>Perceived access to POS with dog-supportive features</td>
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<tr>
<td>Poor/average</td>
<td>446</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>36</td>
<td>1.42</td>
<td>0.69-2.91</td>
<td>0.341</td>
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<td></td>
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<tr>
<td>No</td>
<td>407</td>
<td>1.00</td>
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<td></td>
</tr>
<tr>
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<td>76</td>
<td>2.00</td>
<td>1.16-3.42</td>
<td>0.012</td>
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*Adjusted for demographic, intra-personal, social environmental, and dog-specific factors
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If we build it, they will come?

Any evidence for targeting people and places?
Relative influence of factors associated with walking as recommended (adjusted for demographic factors)

Odds ratio

Giles-Corti & Donovan, Am J Pub Health 2003;93(9):1583-1589

Prevalence of sufficient walking by joint influence of individual and environmental factors

Giles-Corti JAMS 2006 (9):357-366.

Supportive social environment

Supportive physical environment

Low

Medium

High

Low

Medium

High

8.7%

41.5%

27.9%
Odds of walking as recommended by joint influence individual & physical environmental factors

(Adjusted for age, sex, children under 16 at home, education, household income, work outside home, SES of area of residence, and environmental factors) Reference category.

Where to from here?

Centre for the Built Environment and Health – opened November 2007

The Centre aims to do research that is:
- Policy-relevant
- Focussed on the built environment and
  - walking, cycling, transportation choices
  - Obesity
  - Positive mental health
  - Child development
  - Other health outcomes
- Interdisciplinary
- Excellent

Centre Advisory Board

Chair: Mr Evan Jones
- Mr Charles Johnson (Chair)
- Mr Charles Loyd – CEO City of Wanneroo
- Mr Peter Lock 
- Mr Greg Martin
- Ms Sue Leivers
- Ms Margie Tannock
- Prof Steve Zubrick
- Prof Osvaldo Almeida
- Prof Matthew Knuiman
- Dr Clarissa Ball

Centre Chief Investigators

Capacity Building Grant

Funded by:

Mr Charles Loyd
Mr Peter Lock
Ms Sam Lockers
Health Department WA

Mr Greg Martin (Chair)
Prof Oeslade
Professor Rob Donovan
Ms Ruth Durack

Dr Kimberly Van Niel
Prof Steve Zubrick
Prof Matthew Knuiman
Mr Charles Loyd
Greetings from (some of) C_BEH team

Don’t worry about the world coming to an end today.
It’s already tomorrow in Australia.

Charles Monroe Schulz

Thank you for your attention
For more information:

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http://populationhealth.uwa.edu.au/reside
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