Socio-Economic Status and Perceived Barriers to Physical Activity: An Ecological Perspective

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Socio-economic status and physical activity
... current evidence ...

Leisure-time PA

- **Positive association with educational attainment**
  
  \[ \text{WHY?} \] – Positive attitudes towards PA and greater motivation
  – Better skills
  – Better awareness about exercise opportunities and alternatives
  – Social support from family and friends
  – Better health

- **Positive association with household income**
  
  \[ \text{WHY?} \] – As above
  – Greater range of available alternatives
  – PA-friendlier built environment (facilities; infrastructure; safety)

... perceived barriers ... an ecological perspective ...
Transport-related PA

- **Non significant association with educational attainment**
  
  **WHY?** – Greater impact of environmental factors than psychosocial factors?

- **Possible/weak negative association with household income**
  
  **WHY?** – Greater availability of motorized transport
  - Time constraints
  - Preference for other types of physical activity (e.g. leisure-time PA)
  - Better access to services

... perceived barriers ... an ecological perspective ...
Aims of this presentation ... to examine ...

Psychological
- self efficacy
- benefits of PA

Social
- support from family
- support from friends

Socio-economic status

Environmental
- density (1)
- access (6)
- safety (2)
- aesthetics (1)

Perceived barriers to PA

Trans PA
Walk rec
MV LTPA

Mediating, independent, proxy or overlapping factors?
Methods

Participants
- N = 2650 (aged 20-65) – Adelaide, Australia

Multi-stage stratified sampling strategy

32 communities
- High SES and high walkability (n=8)
- High SES and low walkability (n=8)
- Low SES and high walkability (n=8)
- Low SES and low walkability (n=8)

Objective walkability = dwelling density + street connectivity + land use mix + net retail area
Methods ... measures ...

• **Socio-economic status**
  - Educational attainment
  - Household income
  - Area-level median household income (Census)

• **Perceived barriers to PA** (Hovell et al., 1989)

• **Self-efficacy for PA** (Sallis et al., 1998)

• **Perceived benefits of PA** (Hovell et al., 1989)

• **Social support for PA** (Sallis et al., 1992)

• **Neighbourhood Environment Walkability Scale (Aussie)** (Leslie et al., 2005)

• **Number of recreational facilities** (Sallis et al., 1997)
  - Indoor and outdoor individual-sport facilities

• **Physical activity** (IPAQ long; Craig et al., 2002)
  - Walking for recreation
  - Moderate-vigorous leisure-time PA
  - Transport-related PA
Methods ... data analyses ...

- Generalised linear models with robust estimates of standard errors (clustering effects)

- Steps:
  - Relationships between SES and perceived barriers to PA (adjusted for socio-demographic factors)
  - Relationships between SES and psychosocial and environmental factors
  - Independent associations between psychosocial and environmental factors and perceived barriers to PA (controlling for SES)
  - Independent associations between barriers to PA and types of PA (controlling for SES and psychosocial and environmental factors)
  - Direct and indirect ‘effects’ of SES
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Walk rec
MV LTPA

Mediating, independent, proxy or overlapping factors?
### Results: SES and perceived barriers to PA, effect sizes (r)

<table>
<thead>
<tr>
<th>Barriers (0 to 4)</th>
<th>Education (ref: &lt; secondary)</th>
<th>Household income (individual-level) (ref: &lt;Au$ 31k)</th>
<th>Household income (area-level)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facilities</strong> (6.8%)</td>
<td>-.07</td>
<td>-.12</td>
<td>-.09</td>
</tr>
<tr>
<td><strong>Health</strong> (5.7%)</td>
<td>-.07</td>
<td>-.13</td>
<td>-.07</td>
</tr>
<tr>
<td><strong>Skills</strong> (5.6%)</td>
<td>-.09</td>
<td>-.11</td>
<td>-.05</td>
</tr>
<tr>
<td><strong>Look</strong> (3.6%)</td>
<td>-.05</td>
<td>-.08</td>
<td>-.06</td>
</tr>
<tr>
<td><strong>Social s.</strong> (3.7%)</td>
<td>-.06</td>
<td>-.09</td>
<td>-.07</td>
</tr>
<tr>
<td><strong>Motivation</strong> (2.0%)</td>
<td>-.08</td>
<td>-.06</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Weather</strong> (1.1%)</td>
<td>ns</td>
<td>-.05</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Time</strong> (1.0%)</td>
<td>ns</td>
<td>.07</td>
<td>ns</td>
</tr>
</tbody>
</table>

Adjusted for socio-demographic factors and other SES indicators
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Perceived barriers to PA

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## Results

% of SES ‘effects’ on barriers explained by??

<table>
<thead>
<tr>
<th>Barriers (%v)</th>
<th>Psychological</th>
<th>Social</th>
<th>Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities (21%)</td>
<td>22 Edu 16 IHI 16 AHI</td>
<td>10 Edu 9 IHI 12 AHI</td>
<td>8 Edu 13 IHI 72# AHI</td>
</tr>
<tr>
<td>Health (24%)</td>
<td>34 Edu 22 IHI 29 AHI</td>
<td>- Edu - IHI - AHI</td>
<td>15 Edu 15 IHI 50 AHI</td>
</tr>
<tr>
<td>Skills (20%)</td>
<td>24 Edu 25 IHI 37 AHI</td>
<td>4 Edu 8 IHI 10 AHI</td>
<td>6 Edu 14 IHI 44 AHI</td>
</tr>
<tr>
<td>Look (20%)</td>
<td>28# Edu 38# IHI 11# AHI</td>
<td>10 Edu - IHI 7 AHI</td>
<td>20 Edu 32 IHI 16# AHI</td>
</tr>
<tr>
<td>Social (24%)</td>
<td>46# Edu 40# IHI 30# AHI</td>
<td>10 Edu 13 IHI 10 AHI</td>
<td>7 Edu 14 IHI 18# AHI</td>
</tr>
<tr>
<td>Motivation (33%)</td>
<td>50 Edu 69 IHI 52 AHI</td>
<td>10 Edu 15 IHI 18 AHI</td>
<td>- Edu 8 IHI 25# AHI</td>
</tr>
<tr>
<td>Weather (7%)</td>
<td>- Edu 38# IHI - AHI</td>
<td>- Edu - IHI - AHI</td>
<td>- Edu 13 IHI co AHI</td>
</tr>
<tr>
<td>Time (24%)</td>
<td>- Edu spr IHI - AHI</td>
<td>- Edu - IHI - AHI</td>
<td>- Edu spr IHI co AHI</td>
</tr>
</tbody>
</table>

# inconsistent effects present; co = effects cancel out; spr = suppression
Aims of this presentation ... to examine ...

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Mediating, independent, proxy or overlapping factors?
## Results ... independent ‘effects’ of barriers on PA ...

### % change in mean (95% CI)

<table>
<thead>
<tr>
<th>MET-min wk</th>
<th>MV LTPA</th>
<th>Walking for rec</th>
<th>Transport PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M: 601, SD: 1241 (total R² = 28.9%)</td>
<td>M: 416, SD: 726 (total R² = 13.4%)</td>
<td>M: 898; SD: 1420 (total R² = 8.0%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>-20 (-28, -11)</td>
<td>ns</td>
<td>18* (9, 27)</td>
</tr>
<tr>
<td>Health</td>
<td>-18 (-28, -5)</td>
<td>ns</td>
<td>9* (2, 18)</td>
</tr>
<tr>
<td>Skills</td>
<td>-18 (-26, -8)</td>
<td>(13)* (1, 27)</td>
<td>23* (13, 33)</td>
</tr>
<tr>
<td>Look</td>
<td>-11 (-21, -1)</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Social</td>
<td>-22 (-31, -13)</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Motivation</td>
<td>-35* (-44, -25)</td>
<td>-24* (-39, -24)</td>
<td>-21* (-28, -13)</td>
</tr>
<tr>
<td>Weather</td>
<td>-17 (-26, -7)</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Time</td>
<td>-20* (-29, -9)</td>
<td>-8* (-15, -2)</td>
<td>-9* (-15, -3)</td>
</tr>
</tbody>
</table>

* Significant after adjusting for other barriers
### Results ... from SES to PA ... direct and indirect ‘effects’ ...

<table>
<thead>
<tr>
<th>Hypothetical path</th>
<th>MV LTPA</th>
<th>Walking for rec</th>
<th>Transport PA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothetical pathway</strong></td>
<td>Edu</td>
<td>IHI</td>
<td>AHI</td>
</tr>
<tr>
<td><strong>PSE – barriers +</strong></td>
<td>7%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>-</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Barriers</strong></td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>+</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>-</td>
<td>ns</td>
<td>-3%</td>
<td>ns</td>
</tr>
<tr>
<td><strong>PSE</strong></td>
<td>19%</td>
<td>18%</td>
<td>25%</td>
</tr>
<tr>
<td>-</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Direct</strong></td>
<td>35%</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>72%</td>
<td>24%</td>
<td>35%</td>
</tr>
</tbody>
</table>

Comparing low SES with medium-to-high SES; ns = not statistically significant
Main points ... discussion

- **Individual-level and area-level SES differences in perceived barriers to PA**
  - Time barriers vs. other barriers
  - Significant but small effect sizes (measurement problems?)

- **SES-differences in barriers and PA accounted by psychosocial as well as environmental factors**
  - Need for multilevel educational and environmental intervention strategies

- **Promoting transport-related PA to those facing health, skill and facilities barriers (lower SES)**
Thank You!

Chief Investigators:

Prof. Neville Owen, University of Queensland
Prof. Adrian Bauman, University of Sydney
Prof. Gaeme Hugo, University of Adelaide

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