Investigating the "causes of causes" of social inequalities in health in Irish children and adolescents: how do health behaviours become socially patterned?

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Presentation Overview

1. Context
   - Motivation
   - Background
2. Research Objective
3. Methodology
   - Data
   - Methods
   - Analysis
4. Results
5. Key Findings
• Social gradient in health is particularly pronounced for NCDs.
Context

Motivation

SEP
Income, education, occupation

? 

Health outcomes and mortality rates
Motivation

Low levels of physical activity
Motivation

Graph 1: Social gradient in levels of physical activity (by maternal education) in the GUI data.

- Physical activity has a proven relationship to disease risk and there is an expanding body of evidence to support the claim that PA benefits every aspect of health (US Physical Activity Guidelines Advisory Committee, 2018).
• Graphs displaying the relationship between SEP (measured by occupational class, home ownership status and deprivation rate) and mortality using Irish census data.
Graph 1: Level Physical Activity by Class

Graph 2: % Smokers by Age and Class

Graph 3: % Eating Fried Food 4+ Times a Week

Graph 4: % Having 6+ Standard Drinks on 1+ Times a Week

- SLAN survey data showing the social gradient in physical activity, smoking, poor diet and alcohol intake.
Motivation

• “Causes of causes” of health inequalities (Marmot & Wilkinson, 2006).

- SEP
  - Income,
  - education,
  - occupation

- ?

- Levels of physical activity

- Health outcomes and mortality rates.
Background


• Adolescence and physical activity
  – Evidence for tracking (Kwon et.al, 2015; Telama et.al, 2006; Tammelin et.al, 2003)
To measure the contribution of characteristics of a child’s family, peers and school in explaining differences in level of physical activity (PA) by maternal educational attainment.

- SEP differences in parenting style (Kohn, 1959;1963).
- Degree of concerted cultivation (Lareau, 2011).
- Mirroring parent’s behaviors (Lunn, 2006; McMinn et.al,2008).
- Degree to which PA is built into the child’s life (participation in organised sport, active school commute and sedentary minutes) (Jose et.al, 2011; Hume et.al, 2009; Bohnert & Gracia, 2020).
- Number of close friends (Kandel, 1978; Bartley, 2017; Donovan & Giles-Corti, 2002).
- Hours spent on homework
- Classification of school sporting facilities
Data
• Participants were members of the child cohort (age 9, 13 & 17/18).

Sample
• Analyses were restricted to participants who had available data, at all three waves, on our set of predictor variables.

Dependent Variable
• Leisure Time Exercise Questionnaire (Godin & Shepard, 1985).
  – concurrent validity (Godin, Jobin & Bouillon, 1986)
  – construct validity (Godin & Shepard, 1985; Zelener & Schneider, 2016)
  – test-retest reliability (Sallis, Buono, Roby, et al., 1993; Zelener & Schneider, 2016)

Independent Variable
• Maternal Education Level (proxy: SEP).
  – strong (Fletcher & Hirdes, 1996; Sternfeld, Ainsworth & Quesenberry, 1999) and consistent (Lunn, 2006) predictor of physical activity.
Methods

Analysis - Multilevel Models

• There were eight models representing seven groups of variables and one fully-adjusted model. Models were stratified by sex.

<table>
<thead>
<tr>
<th>Base model</th>
<th>maternal education level + age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confounders model</td>
<td>base model + health + personality + BMI + body image</td>
</tr>
<tr>
<td>Class mirroring model</td>
<td>base model + PCG’s physical activity</td>
</tr>
<tr>
<td>Class Cultural model</td>
<td>base model + parenting style+ child’s structured activities</td>
</tr>
<tr>
<td>Peer effect model</td>
<td>base model + number of close friends</td>
</tr>
<tr>
<td>School environment model</td>
<td>base model + academic focus + school sports faculties</td>
</tr>
<tr>
<td>Physical activity built into life model</td>
<td>base model + organised sport + screen-based sedentary activity + transport from school</td>
</tr>
<tr>
<td>Fully adjusted model</td>
<td></td>
</tr>
</tbody>
</table>

• The base model provided the unadjusted SEP differential at each age. Each subsequent model adjusted for a group of variables, indicating their contribution to the SEP differentials.
FEMALES

Graph 2: SEP differential in levels of physical activity between study children whose mothers achieved primary education and study children whose mothers achieved tertiary education for each model

<table>
<thead>
<tr>
<th>Model</th>
<th>Minutes Explained</th>
<th>% Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>base</td>
<td>0.00</td>
<td>0%</td>
</tr>
<tr>
<td>school activities</td>
<td>0.24</td>
<td>1%</td>
</tr>
<tr>
<td>peer effect</td>
<td>0.89</td>
<td>2%</td>
</tr>
<tr>
<td>mirroring parents</td>
<td>1.95</td>
<td>4%</td>
</tr>
<tr>
<td>parenting style</td>
<td>1.67</td>
<td>4%</td>
</tr>
<tr>
<td>confounders</td>
<td>8.10</td>
<td>18%</td>
</tr>
<tr>
<td>PA built into life</td>
<td>15.43</td>
<td>34%</td>
</tr>
<tr>
<td>all</td>
<td>23.13</td>
<td>50%</td>
</tr>
</tbody>
</table>
Results

MALES

Graph 3: SEP differential in levels of physical activity between study children whose mothers achieved primary education and study children whose mothers achieved tertiary education for each model

<table>
<thead>
<tr>
<th>Model</th>
<th>Minutes Explained</th>
<th>% Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>peer effect</td>
<td>0.19</td>
<td>1%</td>
</tr>
<tr>
<td>school activities</td>
<td>0.01</td>
<td>0%</td>
</tr>
<tr>
<td>base</td>
<td>0.00</td>
<td>0%</td>
</tr>
<tr>
<td>mirroring parents</td>
<td>0.31</td>
<td>1%</td>
</tr>
<tr>
<td>parenting style</td>
<td>0.49</td>
<td>2%</td>
</tr>
<tr>
<td>confounders</td>
<td>4.36</td>
<td>17%</td>
</tr>
<tr>
<td>PA built into life</td>
<td>10.33</td>
<td>41%</td>
</tr>
<tr>
<td>all</td>
<td>13.27</td>
<td>52%</td>
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</tbody>
</table>
Key Findings

Key findings

• Home characteristics (or the influence of parents) explains a relatively small proportion of the difference in levels of physical activity between SEP groups.
  – Home characteristics have a stronger impact on females (8%) compared to males (3%).

• Participation in organised sport explains a significant proportion of the SEP differential in levels of physical activity between maternal education groups.
  – Is organized sport a type of “enrichment activity” that parents use to cultivate their children? (McCoy et.al, 2012).


Giles-Corti, B., & Donovan, R. J. (2002). The relative influence of individual, social and physical environment determinants of physical activity. *Social science & medicine, 54*(12), 1793-1812.


Thank you!