Tracking of Objectively Assessed Physical Activity from Childhood to Young Adult: The European Youth Heart Study

Preliminary results

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Study design

14-16 yr.
Invited: 658
Participated: 429

8-10 yr.
Invited: 771
Participated: 589

14-16 yr.
Invited: 771
Participated: 444

20-22 yr.
Invited: 771
Participated: 369

14-16 yr.
Invited: 709
Participated: 458

26-28 yr.
Invited: 658
Participated: 280

1997/98
EYHS I

2003/04
EYHS II

2009/10
EYHS III
Aim

- To investigate the stability of objectively assessed physical activity from childhood to adulthood using measurements from 9-, 15- and 21 year-old individuals in an adjusted model.
3 tracking analyses

<table>
<thead>
<tr>
<th>Baseline age</th>
<th>Followup age</th>
</tr>
</thead>
<tbody>
<tr>
<td>9yr</td>
<td>15yr</td>
</tr>
<tr>
<td>n = 219</td>
<td>n = 155</td>
</tr>
<tr>
<td>15yr</td>
<td>21yr</td>
</tr>
<tr>
<td>n = 164</td>
<td></td>
</tr>
<tr>
<td>9yr</td>
<td>21yr</td>
</tr>
<tr>
<td></td>
<td>n = 164</td>
</tr>
</tbody>
</table>
Hypothesis

- Low tracking from 9 – 21yr
- Moderate tracking from 9 – 15yr
- Low to moderate tracking from 15 – 21yr
Preperation of activity variables

- 1 min epoch
- 1 axis
- 9 h 36 min
- 3 days
- 30 min at 9yr
- 60 min at 15yr and 21yr
- Manually screened for night time removal of activity monitor
Remaining sources of variation

- Within-week variation
- Seasonal variation
- Commuter biking
- (Within instrumental measurement error)
- (Day-to-day variation)
Regression analysis

\[ Y_{ij2} = \beta_0 + \beta_1 Y_{ij1} + \sum_{j=1}^{J} \beta_{2j} X_{ij} + \varepsilon_i \]

- Twisk (2003)
- Outcome: Std. cpm at follow up
- Exposure: Std. cpm at baseline
- Controlling for body fat (sum of skinfolds)
- Clusterings on school level
### Results

9 – 21 yr

N = 161

<table>
<thead>
<tr>
<th></th>
<th>1997/98 EYHS I</th>
<th>2003/04 EYHS II</th>
<th>2009/10 EYHS III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw</td>
<td>Adjusted</td>
<td>Adj. + biking</td>
</tr>
<tr>
<td>Boys</td>
<td>0,19</td>
<td>0,06</td>
<td>0,04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>0,11</td>
<td>0,10</td>
<td>0,13</td>
</tr>
</tbody>
</table>
## Results

**9 – 15 yr**

<table>
<thead>
<tr>
<th>Year</th>
<th>N = 192</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997/98 EYHS I</td>
<td><img src="1997-98.png" alt="Image" /></td>
</tr>
<tr>
<td>2003/04 EYHS II</td>
<td><img src="2003-04.png" alt="Image" /></td>
</tr>
<tr>
<td>2009/10 EYHS III</td>
<td><img src="2009-10.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Raw</th>
<th>Adjusted</th>
<th>Adj.+ biking</th>
<th>Odds ratio (adj.)</th>
<th>Odds ratio (adj. + biking)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>0.28*</td>
<td>0.49**</td>
<td>0.48**</td>
<td>3.82</td>
<td>3.82</td>
</tr>
<tr>
<td>Girls</td>
<td>0.18*</td>
<td>0.42**</td>
<td>0.35*</td>
<td>1.60</td>
<td>1.26</td>
</tr>
</tbody>
</table>

Note: * indicates significance at the 0.05 level, ** indicates significance at the 0.01 level.
# Results

## 15 – 21 yr

<table>
<thead>
<tr>
<th>Year</th>
<th>Raw</th>
<th>Adjusted</th>
<th>Adj.+ biking</th>
<th>Odds ratio (adj.)</th>
<th>Odds ratio (adj. + biking)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>0.15</td>
<td>0.21</td>
<td>0.05</td>
<td>3.38(*)</td>
<td>2.19</td>
</tr>
<tr>
<td>Girls</td>
<td>0.36**</td>
<td>0.53**</td>
<td>0.56**</td>
<td>4.45*</td>
<td>5.00**</td>
</tr>
</tbody>
</table>

*N = 169*
Summary of preliminary results

1. Physical activity tracks moderate for both sexes from childhood to youth.
2. Physical activity tracks moderate for girls from youth to young adulthood.
3. There is a higher risk of staying in lowest quartile for girls from youth to young adulthood.
4. Boys has a greater chance of saying active from child to youth (and likely from youth to adult)
Process plan

• Describe subject characteristics
• Make drop out analysis
• Finish the regression analysis by controlling for random error from:
  1) intra-accelerometer measurement error, and
  2) natural day-to-day variation
• Make a predictability odds ratio
Question

• We are considering using a mixed model to include all three measurements in the same model. If we do so, it is possible to fill in missing data.
  – Is it relevant to consider?
  – What should be regarded when filling in missing data?