Low resting heart rate, sensation seeking and the course of antisocial behaviour across adolescence and young adulthood

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BACKGROUND

Age-crime curve

Blumstein et al, 1988; *Criminology*

Sensation seeking

Raine, 2002; Sijtsema et al, 2010; Portnoy et al; 2014
AIMS

- Examine association between lower resting heart rate in childhood and the course of antisocial behaviour from adolescence into adulthood.

- Investigate whether any association found is mediated by sensation seeking.
METHODS - sample

- UK birth cohort – *Avon Longitudinal Study of Parents and Children*
- Follow-up via questionnaires and research clinics
- Data available for ~ 4,000 young people
METHODS – ASB trajectory

ASB frequency

Age
METHODS – ASB trajectory

- **initial levels (intercept)**
- **final levels (asymptote)**
- **rate of decrease (half-life)**

**Graph Details:**
- **X-axis:** Age (15 to 22)
- **Y-axis:** ASB frequency (0 to 1.6)

Points and markers indicate the trajectory of ASB frequency over age.
METHODS – analysis model

RHR = resting heart rate
SS = sensation seeking
Int = initial ASB levels
Asymp = final ASB levels
RESULTS
initial ASB levels in mid-adolescence

<table>
<thead>
<tr>
<th>ASB intercept</th>
<th>B (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total effect</td>
<td>-0.07 (-0.14, -0.00)</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>-0.07 (-0.10, -0.05)</td>
</tr>
<tr>
<td>Direct effect</td>
<td>0.00 (-0.07, 0.07)</td>
</tr>
</tbody>
</table>

*all analyses adjusted for parent (crime and alcohol problems), child (age, BMI, diastolic blood pressure, alcohol, smoking and physical activity), and sociodemographic confounders
RESULTS
final ASB levels in adulthood

<table>
<thead>
<tr>
<th>ASB asymptote</th>
<th>B (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total effect</td>
<td>-0.05 (-0.12, 0.01)</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>-0.02 (-0.04, -0.01)</td>
</tr>
<tr>
<td>Direct effect</td>
<td>-0.03 (-0.09, 0.04)</td>
</tr>
</tbody>
</table>

*all analyses adjusted for parent (crime and alcohol problems), child (age, BMI, diastolic blood pressure, alcohol, smoking and physical activity), and sociodemographic confounders
CONCLUSIONS

- Lower heart rate associated with higher ASB levels in mid-adolescence and persistence into adulthood

- Associations explained through sensation seeking
  - Understanding mechanisms is critical to best design ASB interventions in those with low heart rate

- Limitations
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