Reward Sensitivity (RS) is associated with snack and Sugar-Sweetened Beverage (SSB) intake in Flemish adolescents

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Background

• Snacking and overconsumption of SSB’s are common in adolescence and persist into adulthood.
• RS is a psychobiological trait, defined as a tendency to engage in motivated approach towards rewarding stimuli, that peaks in adolescence (Figure 1).
• Snacks and SSB’s are highly palatable and thus highly reinforcing, so it is expected that RS influences snack and SSB intake especially in adolescence.

Hypotheses

• RS ↑, intake of snacks and SSB’s ↑
• RS ↑ ➔ energy, sugar, fat, sodium intake from SSB and snacks ↑ (see Figure 2)

Methodology

• Cross-sectional study (n=1104) in 20 schools in Flanders

Measures

• RS by BIS/BAS scales of Muris et al., 2005 (BAS total, drive and Reward Responsiveness (RR))
• Overall and macronutrient intakes of snacks and SSB’s by a quantitative FFQ

Analyses

• Multilevel univariate regression analysis: three level random intercept model (individual-class-school)

Results

Sample characteristics

• Mean age = 14.7 (SD=0.8) years, 50.9% boys, 22.1% overweight or obese
• Mean snack intake per day = 321.1g (SD=212.7)
• Mean SSB intake per day = 234.8ml (SD=252.4)

Associations

Table 1: associations between SSB intake and reward sensitivity

<table>
<thead>
<tr>
<th>Intake per day</th>
<th>Energy Intake per day</th>
<th>Sugar Intake per day</th>
<th>Fat Intake per day</th>
<th>Sodium Intake per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
</tr>
<tr>
<td>BAS total**</td>
<td>0.015(0.006)**</td>
<td>0.044(0.005)**</td>
<td>0.011(0.004)**</td>
<td>0.016(0.005)**</td>
</tr>
<tr>
<td>BAS drive***</td>
<td>0.042(0.013)**</td>
<td>0.039(0.012)**</td>
<td>0.032(0.010)**</td>
<td>0.046(0.010)**</td>
</tr>
<tr>
<td>BAS rr**</td>
<td>0.005(0.013)</td>
<td>0.004(0.012)</td>
<td>0.002(0.010)</td>
<td>0.007(0.010)</td>
</tr>
</tbody>
</table>

*multilevel univariate regression with gender, BMI, type of education and age as control variables
*0.05%, **0.01%, ***0.001%

Table 2: associations between snack intake and reward sensitivity

<table>
<thead>
<tr>
<th>Intake per day</th>
<th>Energy Intake per day</th>
<th>Sugar Intake per day</th>
<th>Fat Intake per day</th>
<th>Sodium Intake per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
<td>b(SE)</td>
</tr>
<tr>
<td>BAS total**</td>
<td>0.008(0.003)**</td>
<td>0.010(0.003)**</td>
<td>0.007(0.002)**</td>
<td>0.011(0.002)**</td>
</tr>
<tr>
<td>BAS drive***</td>
<td>0.017(0.006)**</td>
<td>0.020(0.006)**</td>
<td>0.015(0.005)**</td>
<td>0.022(0.006)**</td>
</tr>
<tr>
<td>BAS rr**</td>
<td>0.012(0.006)*</td>
<td>0.014(0.006)*</td>
<td>0.010(0.005)*</td>
<td>0.016(0.006)*</td>
</tr>
</tbody>
</table>

Conclusion

• RS was positively associated with overall, energy, sugar, fat and sodium intake of snacks and SSB’s (see Tables 1 and 2)

Future developments

• interventions using rewarding paradigms to improve adolescent’s food choices are appropriate and needed.

http://www.rewardstudy.be/