

# 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.

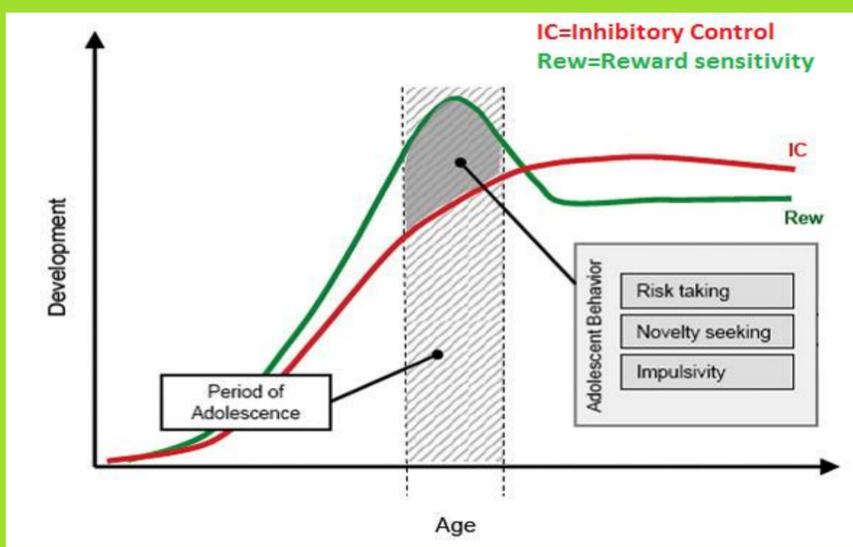


Figure 1: Developmental trajectories of inhibitory control and reward-related neural systems (Hardin & Ernst, 2009).

## Hypotheses

- RS  $\uparrow$ , intake of snacks and SSB's  $\uparrow$
- RS  $\uparrow$   $\rightarrow$  energy, sugar, fat, sodium intake from SSB and snacks  $\uparrow$  (see Figure 2)



Figure 2: hypotheses

## 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

	Intake per day b(SE)	Energy intake per day b(SE)	Sugar intake per day b(SE)	Sodium intake per day b(SE)
BAS total <sup>a</sup>	0.015(0.006)*	0.014(0.005)**	0.011(0.004)**	0.016(0.005)***
BAS drive <sup>a</sup>	0.042(0.013)***	0.039(0.012)***	0.032(0.010)***	0.046(0.010)***
BAS rr <sup>a</sup>	0.005(0.013)	0.004(0.012)	0.002(0.010)	0.007(0.010)

<sup>a</sup>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

	Intake per day b(SE)	Energy intake per day b(SE)	Sugar intake per day b(SE)	Fat intake per day b(SE)	Sodium intake per day b(SE)
BAS total <sup>a</sup>	0.008(0.003)**	0.010(0.003)* **	0.007(0.002)***	0.011(0.002) ***	0.011(0.003)** *
BAS drive <sup>a</sup>	0.017(0.006)**	0.020(0.006)* **	0.015(0.005) ***	0.022(0.006)***	0.023(0.011)** *
BAS rr <sup>a</sup>	0.012(0.006)*	0.014(0.006)*	0.010(0.005)*	0.016(0.006)**	0.016(0.007)*

## 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/>