

Attending to high and low energy density food related visual cues: does weight status have an impact?

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Sensitization to food related visual cues may impact on the development and maintenance of obesity⁽¹⁾. Evidence also suggests exposure to high energy density related food cues results in increased motivational salience⁽²⁾. The aim of this study was to investigate differences in body weight status on attentional processing of high energy density and low energy density food images.

Twenty-six normal weight (mean BMI 22.23 (sd 1.85) kg/m²) and twenty-six overweight/obese (mean BMI 29.28 (sd 3.15) kg/m²) individuals aged 18–56 years participated in an eye tracking paradigm in which eye movements to food (classified into high or low energy density categories) and non-food images were recorded during both a fasted and fed condition in a counterbalanced design. Duration bias (DB) scores (signifying maintenance of attention) were obtained by calculating the average time (in ms) spent attending to high energy density and low energy density food images as a proportion of the total amount of time spent attending to all images (food and non-food). DB scores >0.5 indicate a bias to look longer at food images, 0.5 = no bias and <0.5 indicates a bias towards non-food images⁽³⁾.

Using a mixed-design ANOVA, results demonstrated all participants had a bias towards high energy density food images regardless of BMI grouping (normal weight vs. overweight/obese) or condition (fasted vs. fed). In a fasted condition, normal weight (Fig. 1) and overweight/obese (Fig. 2) participants demonstrated a significant bias towards high calorie food images (mean 0.525 (sd 0.08) vs. mean 0.511 (sd 0.08) respectively) and a bias away from low calorie food images (mean 0.488 (sd 0.11) vs. mean 0.488 (sd 0.04) respectively), $P = 0.023$. In a fed condition, both BMI groups also indicated a significant bias towards high calorie food images (mean 0.503 (sd 0.08) vs. mean 0.519 (sd 0.07) respectively) compared to low calorie food images (mean 0.477 (sd 0.07) vs. mean 0.477 (sd 0.06) respectively), $P = 0.04$. No statistically significant effect was observed between BMI groups or satiety conditions ($P > 0.05$) in terms of DB scores.

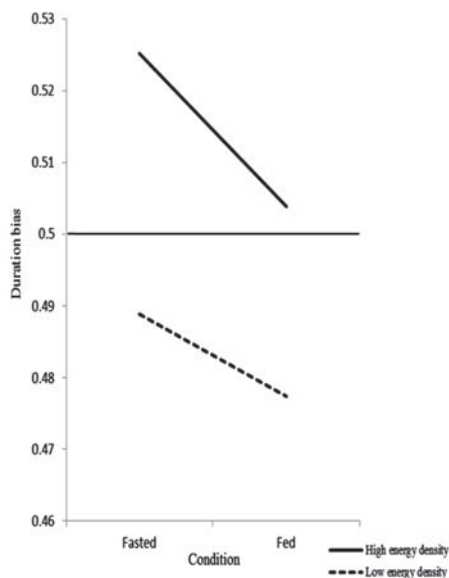


Figure 1. Normal weight (n26).

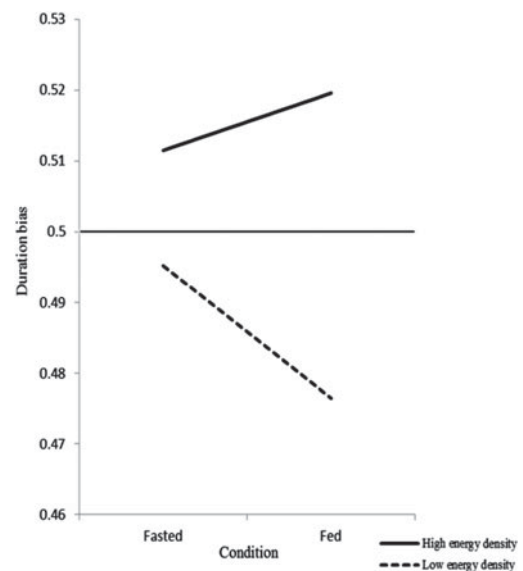


Figure 2. Overweight (n26).

Results from this study demonstrate greater attention to high energy density food cues in normal weight and overweight/obese individuals in both a fasting and fed state. Further investigation of eye gaze direction measures are required to draw additional conclusions on how weight status and state of satiation impacts on the attentional processing of food related environmental cues.

1. Robinson TE & Berridge KC (1993) *Annu Rev Psychol* **53**, 25–53.
2. Castellanos EH, Charboneau E, Dietrich MS *et al.* (2009) *Int J Obes* **33**, 1063–1073.
3. Nijts *et al.* (2010) *Appetite*, **54**, 243–254.