Proceedings of the Nutrition Society (2012), **71 (OCE2)**, E41 doi:10.1017/S0029665112000985

Summer Meeting hosted by the Irish Section, 16–19 July 2012, Translational nutrition: integrating research, practice and policy

Attentional processing of food and exercise images: do overweight/obese individuals differ from their lean counterparts?

K. J. Doolan[1], C. McElhinney[1], S. Smyth[2], G. Breslin[3] and A. Gallagher[1]
[1]*Northern Ireland Centre for Food and Health, University of Ulster, Coleraine BT52 1SA, UK,* [2]*Dublin City University, Dublin, Republic of Ireland and* [3]*Ulster Sports Academy, University of Ulster, Jordanstown BT37 OQB, UK*

Evidence suggests that the reward value of a substance is characterised by bias in attentional processing of related visual stimuli[(1)]. A recent study by Castellanos *et al.*[(2)] used an eye tracking paradigm to explore differences in the motivational salience of food stimuli and results demonstrated that obese and normal weight women did not differ in the attentional processing of food images in either a fasted or satiated condition.

The aim of this pilot study was to further investigate whether attentional processing of food and exercise related images differed between normal weight (*n* 20, BMI $<25\,kg/m^2$) and overweight/obese (*n* 16, BMI $\geq 25\,kg/m^2$)[(3)] individuals in a satiated state.

Attentional bias was assessed using a pictorial visual probe task[(2)]. Following satiation, participants were exposed to pairs of target (food or exercise) and matched neutral images followed by a dot probe replacing one of the images. Food (classified into high or low energy categories) and exercise images were matched for colour and complexity to neutral images and presented in a randomized, counterbalanced design. Attentional bias was determined from latencies in responding to the dot probe (expressed as reaction times in ms), providing an index of attention at image onset.

No statistically significant effects of weight group or gender ($P>0.05$) were observed in relation to reaction time data indicating no difference between groups in terms of initial attention to food images (data not shown). To further examine the effect of weight status on attentional bias, reaction time bias was calculated by subtracting the mean reaction time on trials where the probe replaced the food or exercise image ('congruent' trials) from the mean reaction time on trials where the probe replaced the neutral image ('incongruent' trials). A positive reaction time bias score indicates a vigilance for food and exercise images whereas a negative score indicates avoidance of a food or exercise image[(4)].

In this pilot study, both groups demonstrated an attentional shift away from high calorie food images (mean −6.64 ms (SD 95.08) *vs.* mean −32.72 ms (SD 103.63) respectively) with no difference observed between the groups ($P = 0.437$). The overweight/obese group tended to have an attentional shift away from low energy food images, although this was not significantly different from that of the normal weight group ($P = 0.061$). In contrast there was an attentional shift towards exercise related images, however the magnitude of this shift (of reaction time bias) did not differ between the study groups ($P = 0.989$).

	Normal Weight (*n* = 20; 10M/10F)		Overweight/obese (*n* = 16; 10M/6F)		P^+
	Mean	SD	Mean	SD	
Age (years)	27.55	4.40	28.13	4.06	0.690
BMI (kg/m^2)	22.03	1.63	29.32	3.51	<0.001
Reaction Time Bias (ms)					
High energy	−6.64	95.08	−32.72	103.63	0.437
Low energy	1.439	52.54	−33.45	55.24	0.061
Exercise	20.29	50.54	20.07	54.98	0.989

+ Students independent *t*-test, normal weight *vs.* overweight/obese.

Reaction time data provides only a snapshot of attentional bias at the offset of image presentation. Further investigation is warranted to evaluate differences in eye gaze direction and duration to food and exercise related visual stimuli to determine the possible role that environmental food cues play in the development and/or maintenance of obesity.

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. World Health Organisation (1998) *Obesity: Preventing and managing the global epidemic*.
4. Mogg *et al.* (1998) *Behav Res Ther* **36**, 227–237.