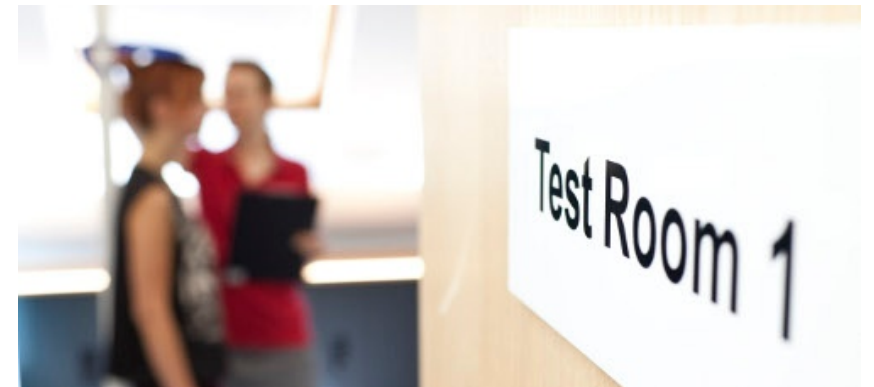


Nutrition and behaviour research in the School of Experimental Psychology, University of Bristol

Peter Rogers

EDHIT research meeting 8th July 2016



NBU research and funding

Expertise in

- experimental psychology
- biological psychology
- nutrition

Research on

- appetite and weight control
- food choice
- dietary effect on mood and behaviour

Funders include

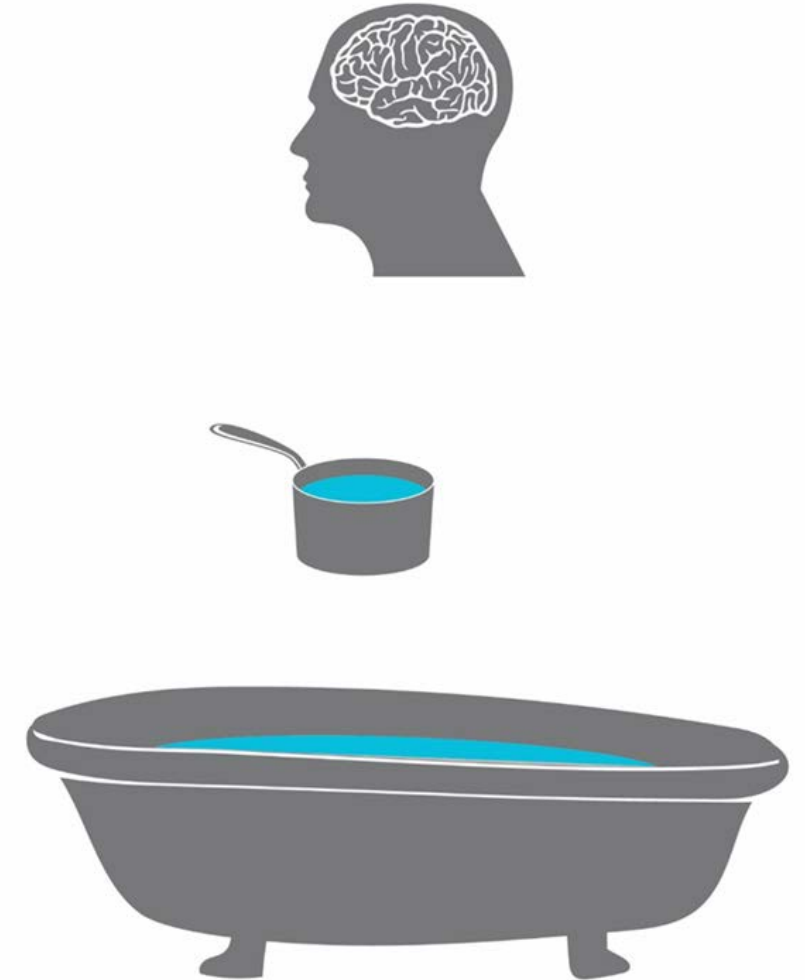


- Daily energy requirement of a moderately active lean person weighing 65 kg is about 2300 kcal
- Total energy stored in the body is about 75 x daily energy intake
 - Fat stores, 55 x daily energy intake
 - Protein stores, 20 x daily energy intake
 - Carbohydrate stores, <1 x daily energy intake
 - glycogen 18 h, free glucose 30 min



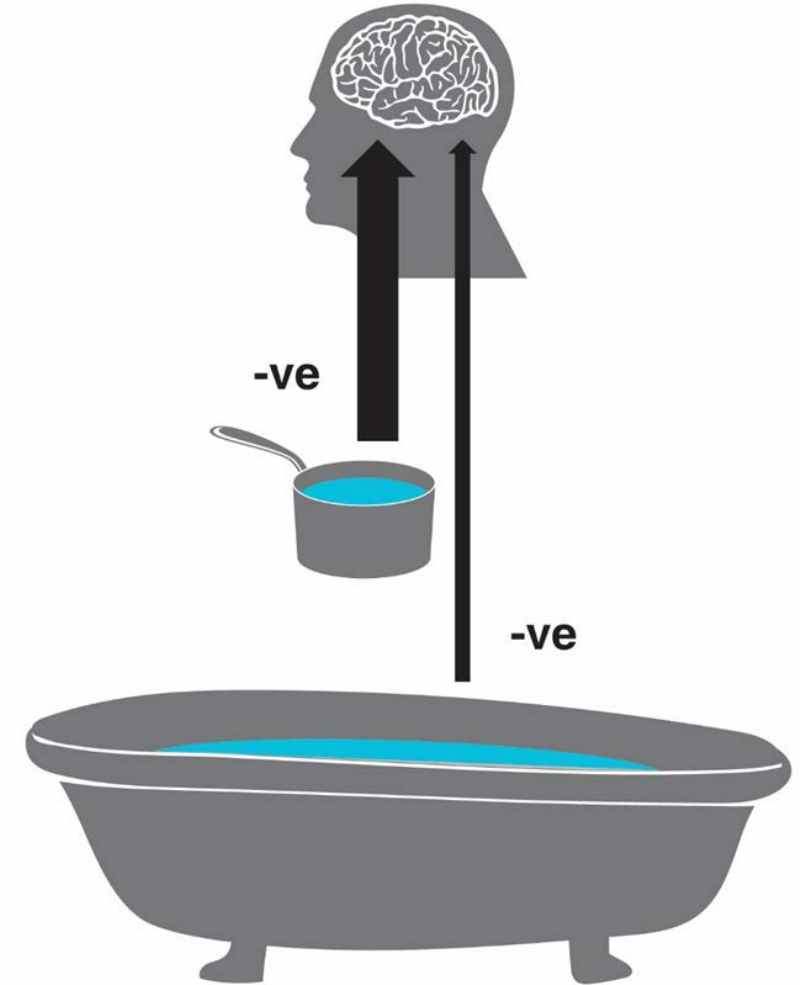
An analogy for human appetite and energy balancing

- Body energy stores (bath tub) are replenished via the gut (saucepan).
- Ratio of energy content of an average meal to body energy stores is about 1:180.
- So missing a meal can be expected to have a trivial effect on energy supply to the brain and muscle.

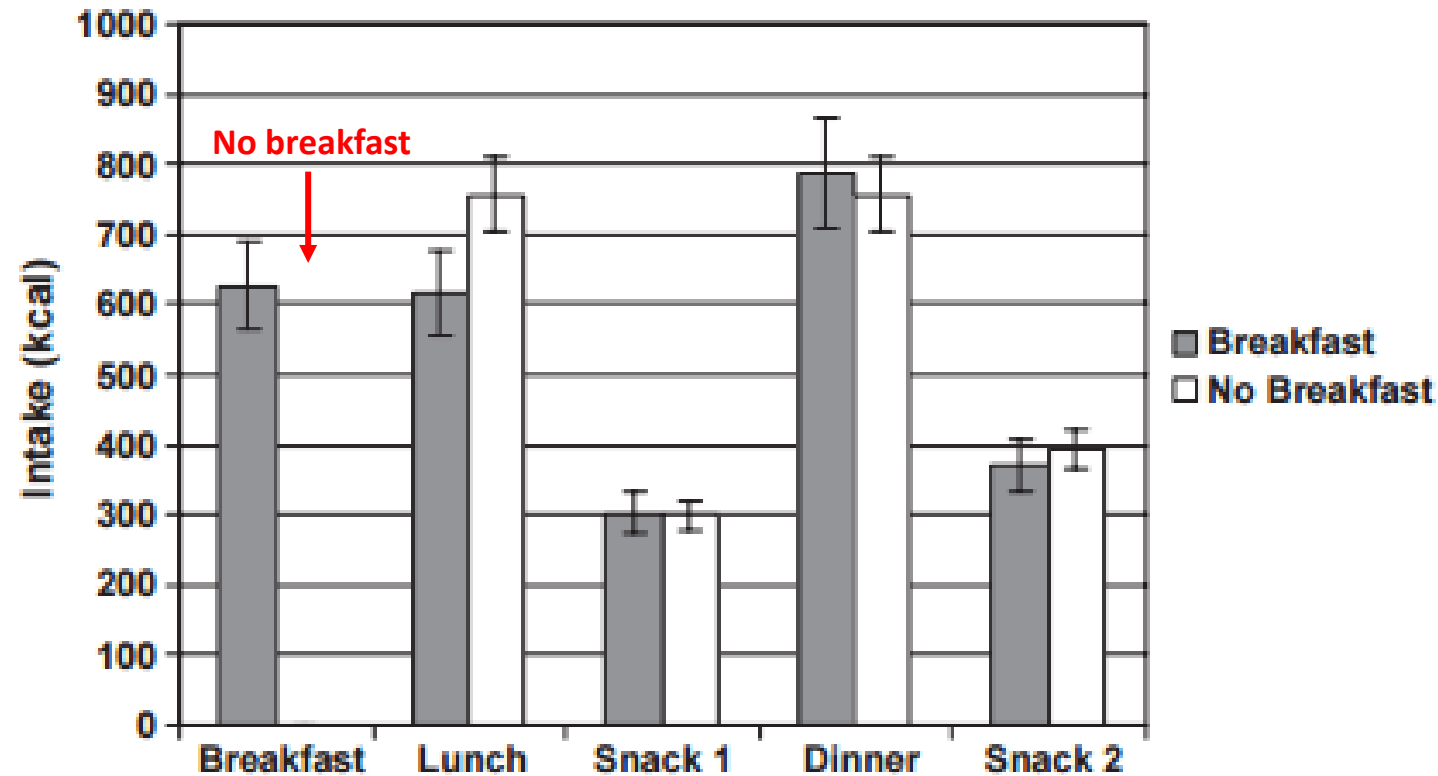


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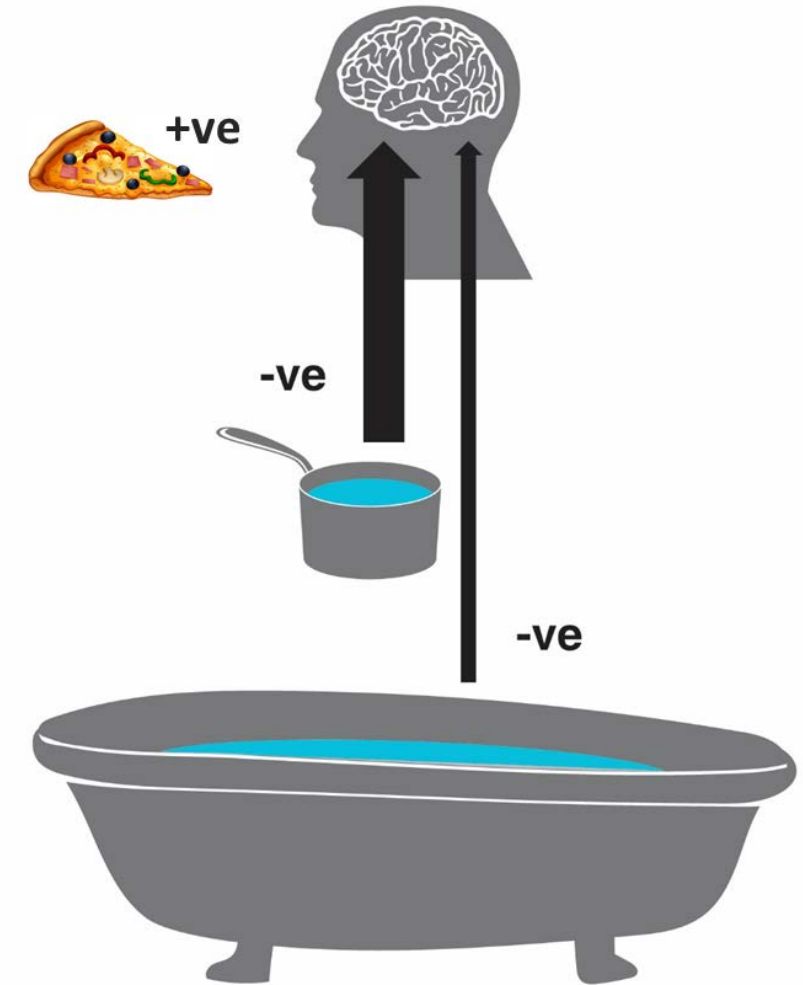
How to decrease energy intake – miss breakfast



After missing 625 kcal breakfast
Lunch intake \uparrow 135 kcal
Total day intake \downarrow 495 kcal

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- So missing a meal can be expected to have a trivial effect on energy supply to the brain and muscle.
- Both the gut and body fat stores resist being filled proportional to their contents (negative feedbacks).
- We eat because eating is rewarding (pleasurable). Eating is more rewarding when we like the food and our gut is empty.



Cognitive performance and mood of current dieters and non-dieters before and after eating a Mars Bar

- Participants

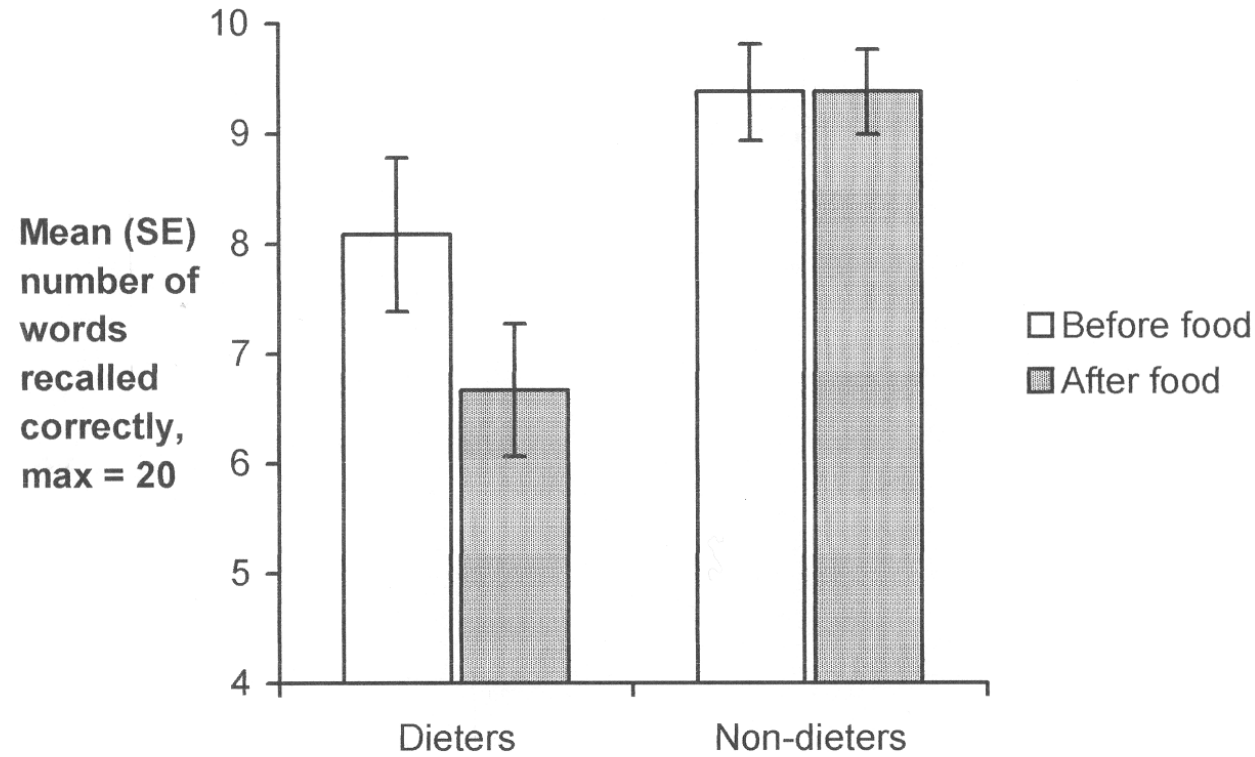
- 20 currently dieting, and 19 non-dieting women
- Aged 19-47 years

- Methods

- Mood and hunger
- Performance on tapping, RVIP, SRT and memory tasks
- **Asked to eat a Mars Bar** (option to withdraw from experiment repeated)
- Left alone for 15 minutes
- Mood and hunger
- Performance on tapping, RVIP, SRT and memory tasks
- Semi-structured interview about thoughts and feelings during the experiment



Immediate memory performance in current dieters and non-dieters before and after eating a Mars Bar

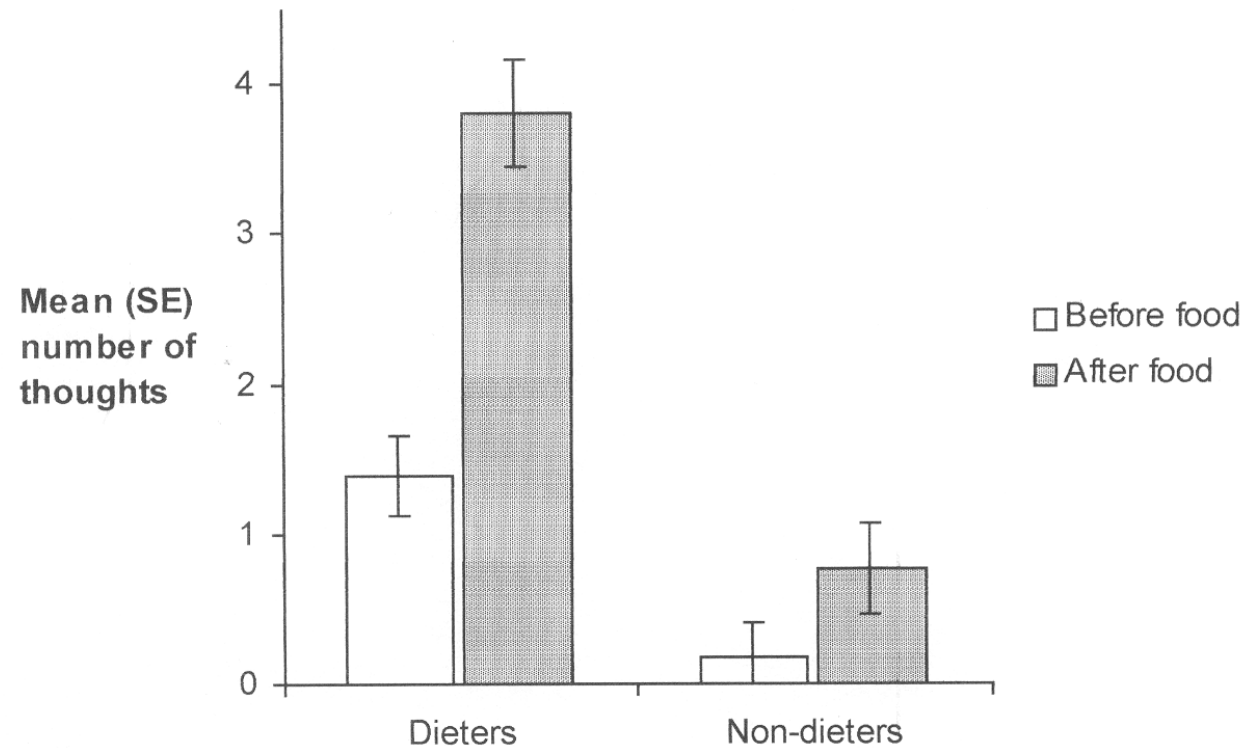


Effect of dieting, $p < .01$

Effect of food (before/after), $p < .05$

Dieting x food, $p < .05$

Thoughts about food and dieting in current dieters and non-dieters before and after eating a Mars Bar

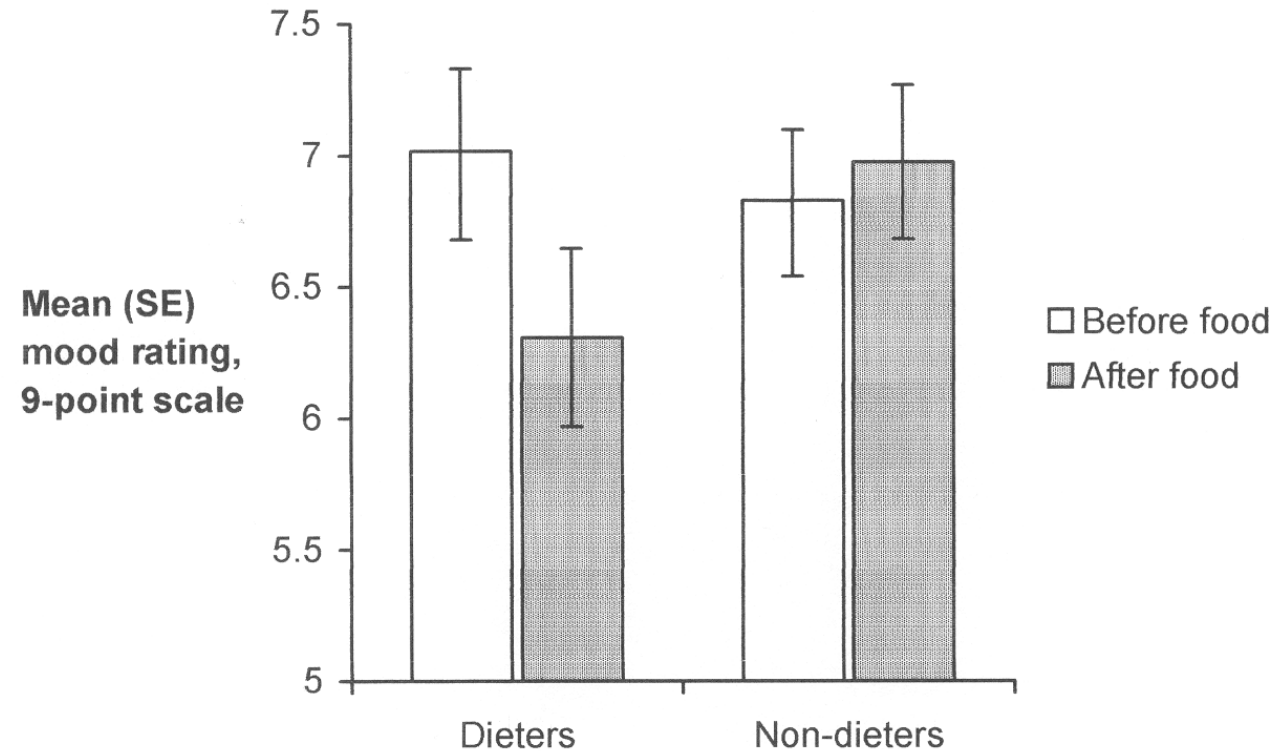


Effect of dieting, $p < .001$

Effect of food (before/after), $p < .001$

Dieting x food, $p < .001$

Positive affect in current dieters and non-dieters before and after eating a Mars Bar



Effect of dieting, *ns*

Effect of food (before/after), *ns*

Dieting x food, $p < .05$

Extracts from transcripts of interviews with dieters

- “I was aware in the number test and the memory test I was losing my concentration, and had to go back and think about it. Yes, some of my thoughts were about food... I’m feeling quite guilty at the moment because I haven’t been to the gym for a while, so subconsciously that’s been on my mind...”
- “It’s just a Mars Bar, not the end of the world.”
- “I had a weird sense of feeling that I wanted to do well on the tasks because I’d just done something naughty; it was guilt really, and I was trying to prove to myself that I was still in control.”

'Top-down' influences on hunger and satiety

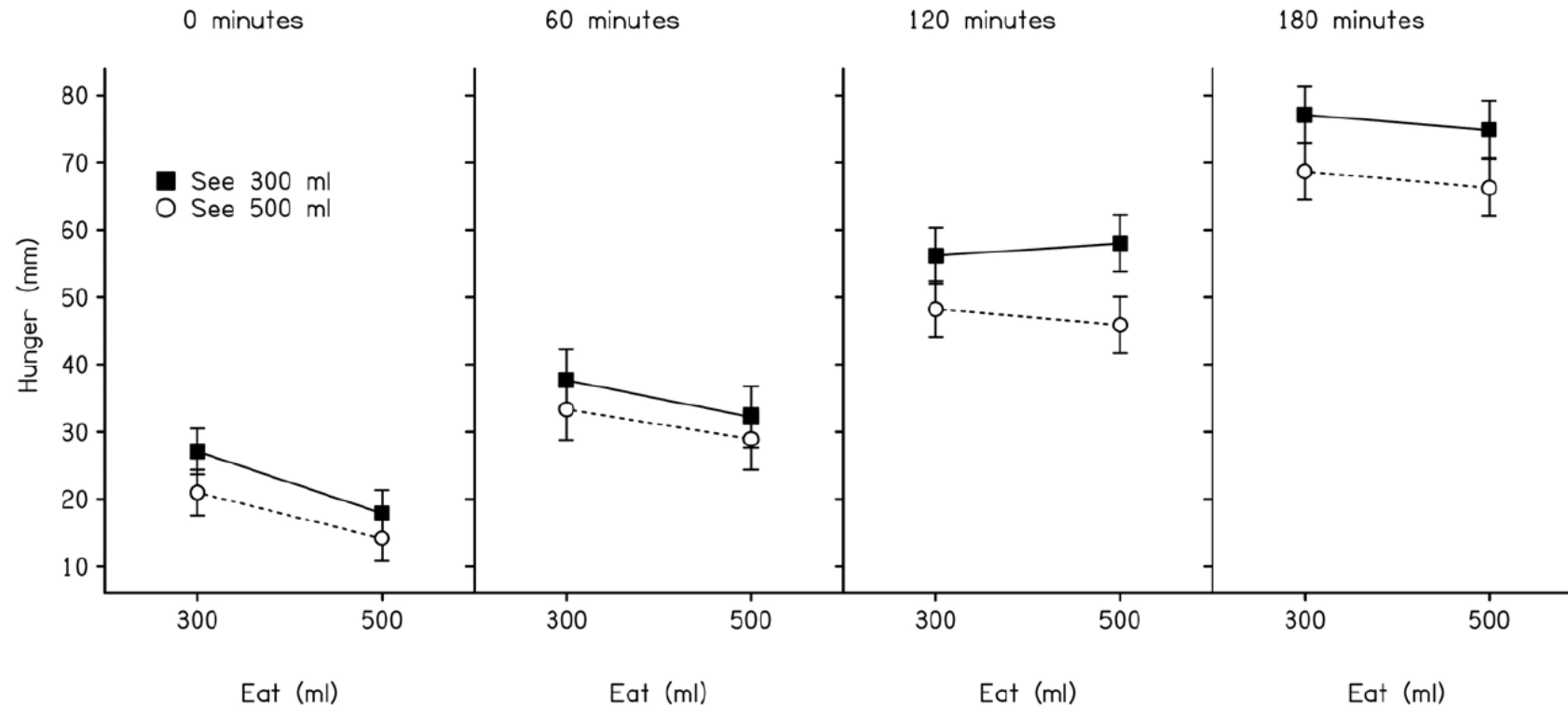


Figure 2. Estimated marginal means (\pm SEM) for hunger ratings (0–100 mm) taken 0, 60, 120, and 180 minutes after consuming the soup. Separate values are provided for participants in each condition.
doi:10.1371/journal.pone.0050707.g002

'Top-down' influences on hunger and satiety

Beverage consumption, appetite, and energy intake: what did you expect?¹⁻³

Bridget A Cassady, Robert V Considine, and Richard D Mattes

Am J Clin Nutr 2012;95:587-93.

Results: Oral-liquid and perceived gastric-liquid preloads elicited greater postprandial hunger and lower fullness sensations, more rapid gastric-emptying and orocecal transit times, attenuated insulin and glucagon-like peptide 1 release, and lower ghrelin suppression than did responses after oral-solid and perceived gastric-solid treatments (all $P < 0.05$). Faster gastric-emptying times were significantly associated with greater energy intake after consumption of perceived gastric-liquid preloads ($P < 0.05$). Energy intake was greater on days when perceived gastric-liquid preloads were consumed than when perceived gastric solids were consumed (2311 ± 95 compared with 1897 ± 72 kcal, $P = 0.007$).

