Expected satiety and the hidden complexity of meal planning

Jeff Brunstrom
Cue reactivity

Figure 2  Salivation (g) before and after exposure to a food cue (pizza) in overweight and lean individuals, separately.

‘I just can’t help myself’: effects of food-cue exposure in overweight and lean individuals

How do we interact with food?

Why we eat what we eat?
Meal planning is common

What determines real-world meal size? Evidence for pre-meal planning

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Computer-based assessments of expected satiety predict behavioural measures of portion-size selection and food intake

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Using photography in ‘The Restaurant of the Future’: A useful way to assess portion selection and plate cleaning

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Learning in humans

The typical 21-year old has consumed 21,000 meals
Introducing expected satiety and expected satiation

‘Expected satiation’ (fullness)
‘Expected satiety’ (lack of hunger)
Method of adjustment

Match the food on the right to the food on the left

Standard: Margherita pizza

Comparison: Chicken tikka masala
Challenging assumptions about controls of meals size

Fig. 1. Relationships (Pearson's) between meal-size predictors and actual meal intake. Strong and weak associations are indicated by wide and narrow arrows, respectively.

Computer-based assessments of expected satiety predict behavioural measures of portion-size selection and food intake

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Related research


Observations

- Extremely good discrimination
- Expectations are learned
- Expectations can be enhanced
Expected satiety influences actual satiety

(a) Change in hunger

(b) Change in fullness

‘Expected satiety’ changes hunger and fullness in the inter-meal interval

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Expected satiety and food choice
Expected satiety and food choice

- Tastes better?
- More calories?
- More filling?
Expected satiety and food choice

50 kcal

50 kcal
Portions matched for energy content
Expected satiation

![Expected satiation graph](image)

- fc
- las
- pi
- cm
- smp

Kcal

Expected satiation values for different food items.
Portion (kcal) = 100 kcal portions (r = 0.89, p = 0.041)
Portion (kcal) = 200 kcal portions (r= 0.88, p= 0.05)

Portion (kcal) = 500 kcal portions (r= 0.88, p= 0.05)

Portion (kcal) = 300 kcal portions (r= 0.85, p= 0.05)

Portion (kcal) = 400 kcal portions (r= 0.85, p= 0.05)

Portion (kcal) = 500 kcal portions (r= 0.85, p= 0.05)

Portion (kcal) = 800 kcal portions (r= 0.85, p= 0.05)
Portion (kcal) = 200 kcal portions ($r= 0.88$, $p= 0.05$)

Portion (kcal) = 400 kcal portions ($r= 0.57$, $p= 0.318$)

Portion (kcal) = 500 kcal portions ($r= -0.35$, $p= 0.565$)

Portion (kcal) = 700 kcal portions ($r= -0.91$, $p= 0.034$)
Portion (kcal) = 300 kcal portions (r = 0.70, p = 0.189)

Portion (kcal) = 500 kcal portions (r = -0.35, p = 0.565)

Portion (kcal) = 700 kcal portions (r = -0.91, p = 0.034)

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Fullness favoured
Why is this important?

Challenges long-standing assumptions

This exposes quantifies the dynamic relationship between portion size and ‘eating for fullness’ in food choice.

Raises questions about population and individual differences
Are these patterns universal?
Food choice in a Samburu sample

Expected satiation
Choice
Portion (kcal)
- 100
- 200
- 300
- 400
- 500

Food choice in a Samburu sample
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