Food memories and appetite: implications for obesity interventions

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Context
- Social situation/norms
- Culture
- Time of day
- Distractors

Individual characteristics
- Reward responsiveness
- Satiety
- Mood

Food characteristics
- Appearance
- Sensory characteristics
- Price
- Availability/Accessibility

Personal history
- Flavour preference/aversion learning
- Learned satiety
Memory of recently eaten foods affects later intake

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Amnesic patients overeat

Control N = 4 (one two-lunch test)
Two patients (2 tests each)

Cognitive influences on food intake: The effects of manipulating memory for recent eating

Suzanne Higgs

Learning and Memory Processes and Their Role in Eating: Implications for Limiting Food Intake in Overeaters

Suzanne Higgs • Eric Robinson • Michelle Lee

Eating attentively: a systematic review and meta-analysis of the effect of food intake memory and awareness on eating

Eric Robinson, Paul Aveyard, Amanda Daley, Kate Jolly, Amanda Lewis, Deborah Lycett, and Suzanne Higgs
Television watching during lunch increases afternoon snack intake of young women

Suzanne Higgs*, Morgan Woodward

School of Psychology, University of Birmingham, Edgbaston, Birmingham, B15 2TT, United Kingdom

10 min

12.00-1.30 pm

No TV

10 min

2.30-4.30 pm

Biscuit taste test
Television watching during lunch increases afternoon snack intake of young women

Suzanne Higgs *, Morgan Woodward

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Mean memory vividness rating for television condition = 66.2

Mean vividness rating for no TV condition = 77.4
Disruption of lunch memory increases later snack intake and decreases lunch memory ratings.
Disruption of lunch memory increases later snack intake and decreases lunch memory ratings.

Mean number of lunch items recalled in correct order (/8):

- Control condition = 7.4
- Low distraction = 7.2
- High distraction = 5.5

Intake is negatively correlated with memory vividness.

Higgs and McVitte (in prep)
Disruption of lunch memory encoding affects later intake


Mittal et al. (2011). Snacking while watching TV impairs food recall and promotes food intake on a later TV free test meal. Applied Cognitive Psychology, 25, 871-877

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Total</th>
<th>Control Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Std. Mean Difference IV, Fixed, 95% CI</th>
<th>Std. Mean Difference IV, Fixed, 95% CI</th>
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</thead>
<tbody>
<tr>
<td>Higgs 2009 (8)</td>
<td>8.3</td>
<td>2.4</td>
<td>16</td>
<td>6.8</td>
<td>2</td>
<td>16</td>
<td>19.0%</td>
<td>0.66 [-0.05, 1.38]</td>
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<tr>
<td>Mittal 2011 Exp1</td>
<td>1584.6</td>
<td>516.4</td>
<td>16</td>
<td>1354.9</td>
<td>335.6</td>
<td>16</td>
<td>19.4%</td>
<td>0.51 [-0.19, 1.22]</td>
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<tr>
<td>Mittal 2011 Exp2</td>
<td>2507</td>
<td>438.2</td>
<td>21</td>
<td>2147.9</td>
<td>527.2</td>
<td>7</td>
<td>12.5%</td>
<td>0.76 [-0.12, 1.64]</td>
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<tr>
<td>Mittal 2011 Exp2</td>
<td>2637.6</td>
<td>527.2</td>
<td>21</td>
<td>2147.9</td>
<td>527.2</td>
<td>7</td>
<td>12.2%</td>
<td>0.90 [0.01, 1.79]</td>
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<tr>
<td>Mittal 2011 Exp2 STV</td>
<td>2642</td>
<td>452.4</td>
<td>21</td>
<td>2147.9</td>
<td>527.2</td>
<td>7</td>
<td>10.8%</td>
<td>1.43 [0.49, 2.38]</td>
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<tr>
<td>Oldham-Cooper 2011</td>
<td>52.1</td>
<td>46.1</td>
<td>22</td>
<td>27.1</td>
<td>26.4</td>
<td>22</td>
<td>26.1%</td>
<td>0.66 [0.06, 1.27]</td>
<td></td>
</tr>
</tbody>
</table>

Subtotal (95% CI): 117

Heterogeneity: Chi² = 2.67, df = 5 (P = 0.75); I² = 0%
Test for overall effect: Z = 4.77 (P < 0.00001)
Distracting activities are associated with overeating

Suzanne Higgs

*School of Psychology, University of Birmingham, Edgbaston, Birmingham*

* = significantly different from no cue and lunch yesterday conditions, P < 0.05

Higgs (2002)
Recall of recent lunch and its effect on subsequent snack intake

Suzanne Higgs *, Amy C. Williamson, Angela S. Attwood ¹

Significant effect of cue (p < 0.05)
Significant effect of corn (p < 0.05)
Focusing on food during lunch enhances lunch memory and decreases later snack intake

Suzanne Higgs, Jessica E. Donohoe*

School of Psychology, University of Birmingham, Edgbaston, Birmingham, West Midlands, England B15 2TT, United Kingdom

Intake is negatively correlated with memory vividness

* = significantly different from control and food thoughts condition, P < 0.05
Eating ‘attentively’ reduces later energy consumption in overweight and obese females

Eric Robinson\textsuperscript{*1}, Inge Kersbergen\textsuperscript{1} and Suzanne Higgs\textsuperscript{2}

\textsuperscript{*}To whom correspondence should be addressed.
Applications

• Attentive eater app
  • Designed to enhance food memories
  • Use photos of last meal as reminders
  • Photos can be shared to promote social influences

• How it works
  • Prior to eating access the app to snap their meal
  • Info recorded and relayed back once finished
  • Prior to later eating, app reminds users of consumption
Feasibility Trial

- 12 overweight/obese participants
- 20 minute consultation
- Month long usage trial
- User acceptance via interviews
- Usage downloaded from phone
- Weight pre and post

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>BMI</td>
<td>32.1 (5.3)</td>
</tr>
<tr>
<td>Weight</td>
<td>96.3 kg</td>
</tr>
<tr>
<td>Age</td>
<td>41.1 (12.4)</td>
</tr>
<tr>
<td>Gender</td>
<td>7 females, 5 males</td>
</tr>
<tr>
<td>Smartphone users</td>
<td>Iphone</td>
</tr>
</tbody>
</table>
Results

• Usage
  • Accessed 5.7 times a day (SD=2.5)
  • Fully recorded episodes per day = 2.7 (S.D = 1.5)

• Acceptance
  • Positive Questionnaire data
  • easy to use, intend use in the future

• Weight Loss
  • -1.5kg (SD = 2.8)
  • 6/12 participants lost >1kg, 4 = 0-1kg and 2 gained between 0.1 and 0.4 kg
Conclusions

Episodic food memories play a role in appetite control

“Attentive eating” might be useful in weight control for some people
Acknowledgements

Researchers: Angela Attwood, Jessica Donohoe, Inge Kersbergen, Henry McVitte, Eric Robinson, Amy Williamson, Morgan Woodward
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Thank you