Food Psychology: Why We Eat More Than We Think

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Food and Health Survey 2015

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Jim Painter

- Board Member/Advisory Panel
  - California Raisin Marketing Board, Sun-Maid Growers of California, the Wonderful Company, American Heart Association Eat Well Task Force
- Consultant
  - Davidson’s Safest Choice, National Dairy Council
- Speaker’s Bureau
  - Abbott Nutrition
- Other
  - Speaker honorarium underwritten by Davidson’s Safest Choice Eggs.

4 out of 5 Americans are Trying to Lose Weight or Maintain their Current Weight

Which of the following food descriptions do you currently do?

- Losing weight
- Trying to lose weight
- Keeping my weight
- Trying to gain weight
- Currently not doing anything
Obesity Trends Among U.S. Adults
BRFSS, 1990
(*BMI ≥30, or ~30 lbs. overweight for 5’4” person)

% of Females with BMI >30 in 2008

What is the answer to weight gain

1. Eat mindlessly, but change the dining environment
   - Portion size, smaller containers & packages
   - Less visible & convenient

2. Eat mindfully
   - Visual cues influence consumption
   - Write it down

3. Choose the right form of the foods
   - Higher protein & fiber, lower sugar

What is the answer to weight gain

- Portion size
  1. Restaurants

I. Portion size

Historical Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Introduction</th>
<th>Size in Ounces</th>
<th>BMI Size</th>
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<tbody>
<tr>
<td>Budweiser</td>
<td>1936</td>
<td>7.0</td>
<td>7,12,22,40</td>
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<td>Hershey</td>
<td>1908</td>
<td>0.6</td>
<td>1.6,2.0,2.4</td>
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<tr>
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Then and Now... Bagel
20 years ago
• 3 in diameter
• 140 calories
Today
• 350 calories

Then and Now... Spaghetti
20 years ago
• 1 C. pasta-sauce w/ 3 meatballs
• 500 calories
Today
• 2 C. pasta-sauce w/ 3 meatballs
• 1,025 calories

Then and Now... Fries
20 years ago
• 2.4 oz
• 210 calories
Today
• 6.9 oz
• 610 calories

Then and Now... Burger
20 years ago
• 333 calories
Today
• 590 calories
Monster Burger
• 1420 calories

From the monster to the Riley burger

From Riley to more madness
Calorie Comparison of 7-eleven Coke-a-Cola

- Gulp (20oz)
- Big Gulp (30oz)
- Super Gulp (40oz)
- Double Gulp (50oz)

CBS Features Portion Size Me

Other Trends
- Nestle Toll House cookies
  - recipe yields 60 vs. 100 when written in 1949

II. Smaller Containers
- General Finding About Package Size . . .
  - Study 1. Package Size
  - Study 2. Portion Size
  - Study 3. Serving Shapes
  - Study 4. Shape Study #2

Super Size Me Documentaries

Package Size Increases Consumption
- People who pour from larger containers eat more than those pouring from small
  - Consistent across 47 of 48 categories

General Finding: Package Size Can Double Consumption
Hungry for Some Stale Movie Popcorn?

- General Question
  - Does portion size effect consumption?
- The Field Study (Chicago, IL)
  - 2x2 Design
    - Large vs. X-Large Popcorn (pre-weighed)
    - Fresh vs. 10-day-old Popcorn

We Eat Much More from Big Containers

- People eat 45-50% more from extra-large popcorn containers
- They still eat 40-45% more with stale popcorn

III. The effect of visibility and convenience on dietary consumption

Gas stations, remember when someone else pumped the gas

Fast food, remember when you had to go in

Amount of Candy Consumption According to Condition

Increase in Dietary Intake When Food is Visible (on desk) Compared to Invisible (in desk)

II. Eat Mindfully

- Visual cues
- Write it down

Soup Study

- Fifty-four participants (72% male)
- ½ were given a normal bowl
- ½ were given a refillable bowl
- Details were not provided about the study
- But bowls used in the study were different colors
- Subjects were guessing the purpose of the study.

Refillable Soup Bowls Increase Consumption, but Not Perception of Consumption

Eat mindfully, Write it down

- Self monitoring
  - Know what you are eating
  - Track what you are eating
Efficacy Self monitoring

- 38 subjects
- Sample was split into four quartiles (based on participants' self-monitoring consistency
- During holiday (3 weeks) and non-holiday weeks (7 weeks).

Baker and Kirschenbaum 1998, Health Psych

Efficacy of self monitoring

- 57 subjects
- Over the holiday season
- Intervention (adding self-monitoring) 2 weeks pre holiday
- During a 2-week holiday period
- And 2 weeks post holiday.

Boutelle et al. 1999, Health Psych

III. CHOOSING THE RIGHT FORM OF THE FOOD

Eggs for Breakfast- Methods

Healthy, overweight, and obese individuals were assigned to:
- Egg
- Egg Diet (1000 kcal)
- Bagel
- Bagel Diet (1000 kcal)

* All participants received equal energy density and total density

Differences in Weight, BMI, WC, %Body Fat

Changes between baseline and final visit (8wks)

Results
After 8 weeks ED group had:
• 61% greater reduction in BMI compared to the BD group
• 65% greater weight loss compared to BD group
• 34% greater reduction in waist circumference compared to BD group
• 16% greater reduction in percent body fat compared to BD group

Eggs and Satiety

Effects of Eggs on Consumption

Table 1: Composition of egg, cereal and croissant based breakfast

<table>
<thead>
<tr>
<th></th>
<th>Egg</th>
<th>Cereals</th>
<th>Croissant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>1,360</td>
<td>1,360</td>
<td>1,360</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>12.4</td>
<td>9.3</td>
<td>5.9</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>20.8</td>
<td>9.5</td>
<td>17.9</td>
</tr>
<tr>
<td>Carbohydrate (g)</td>
<td>38.5</td>
<td>52.6</td>
<td>37.8</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>341</td>
<td>498</td>
<td>326</td>
</tr>
</tbody>
</table>

Egg breakfast VS cereal breakfast
• Egg significantly lower (p=0.030) intake at lunch

Egg breakfast VS croissant breakfast
• Egg significantly lower (p=0.023)

Effects of Eggs on Future Intake

Egg breakfast VS croissant breakfast
• Egg significantly lower (p=0.030) intake at lunch

Where did the Cholesterol Recommendations come from?

Studies did not take into account other risk factors

Studies provided excessive amounts of DC

Cholesterol Recommendations

Based on animal studies
In 1912 Anichkov discovered that feeding cholesterol to rabbits led to atherosclerosis. * Rabbits are herbivores- metabolize cholesterol differently

Rabbits are herbivores- metabolize cholesterol differently


Population study 2,332 men aged 42-60 y
- During an average follow-up of 19.3 y, 432 men developed T2D.
- Those in the highest compared with the lowest quartile of egg intake quartile had a 38% (p=0.001) lower risk of incident T2D
- In conclusion, our study did not show any adverse effects of moderate egg intake (up to 1 egg/d) on the risk of T2D in middle-aged and older men.
- They still recommend limiting eggs for people with T2D citing past studies.

Implications
1. Eat mindlessly, change the dining environment
   - Portion size, smaller containers & packages
   - Less visible & convenient
2. Eat mindfully
   - Visual cues influence consumption
   - Write it down
3. Choose the right form of the foods
   - Higher protein & fiber lower sugar

The effect of a high-egg diet on cardiovascular risk factors in people with type 2 diabetes: the Diabetics and Egg (DIABEGG) study—a 3-mo randomized controlled trial

Nicholas B Fuller, Jan De Caterina, Amanda Rainey, Gershon Dekker, Marcella Fung, James Groop, Katherine Bogle, Kathleen M Williams, Simone S Lau, and Dany P Werther

"High egg consumption did not have an adverse effect on the lipid profile of people with T2D in the context of increased MUFAs and PUFAs consumption. " (Fuller, 2015)

This study suggests that a high-egg diet can be included safely as part of the dietary management of T2D, and it may provide greater satiety.