Determinants of Food Choice in a Large US Sample

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Introduction

- Why is it that we know what foods we should eat but fail to eat them, or choose not to eat at all?
- Such disordered eating poses huge health risks

  For example:
  - Prevalence of obesity is 39.8% of US adults (93.3 million; 1)
  - Anorexia nervosa has the highest death rate of any psyciatric illness (2)
- To understand maladaptive eating behavior, we need to first characterize eating behavior in a large sample drawn from the general population.

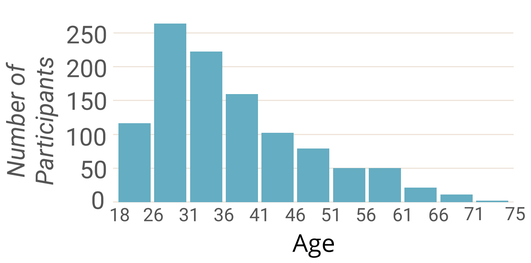
Methods

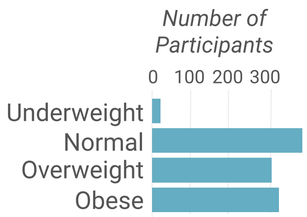
Goal: Collect a population sample that links to prior research and guides future research.

Sample: N = 1,075

Representative of US adult population

- Equal number male/female
- Majority employed
- Majority with college degree
- Median income of $50-75,000



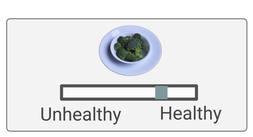


Study: Based on prior food choice tasks (3)

45 foods shown to each participant (138 total foods)

Experiment was run online on Amazon Mturk. The experiment lasted 60m and included, in the following order, demographic questions, food ratings, and a food choice task.

Ratings/choices were done on a continuous slider scale (0-1). No time limit on a response.



Food Ratings:
17 ratings including health and taste (re: subjective value) and nutritional facts (e.g., calories, fats, etc)

Food Choice:
Foods compared to reference (rated neutral on taste and health).

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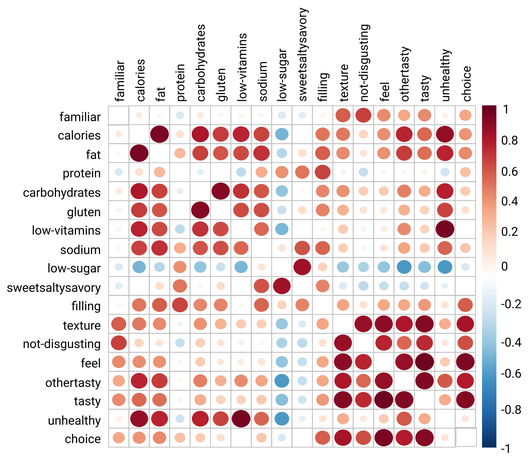
References

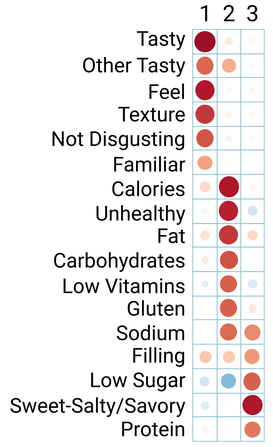
1. Hales et al., (Oct 2017) *NCHS data brief.* no 288.
2. Arcelus et al., (2011). *Arch of Gen Psychiatry*. 68: 724-731.
3. Foerde et al., (2015). *Nat Neuro*. 18: 1571-1573

Food Ratings

Foods are evaluated according to three factors



Correlations between food ratings



Factor analysis

Factor 1: Sensory Experience
(***Taste***, feel, texture, etc)

Factor 2: Nutritional Content
(***Health***, calories, fat, etc)

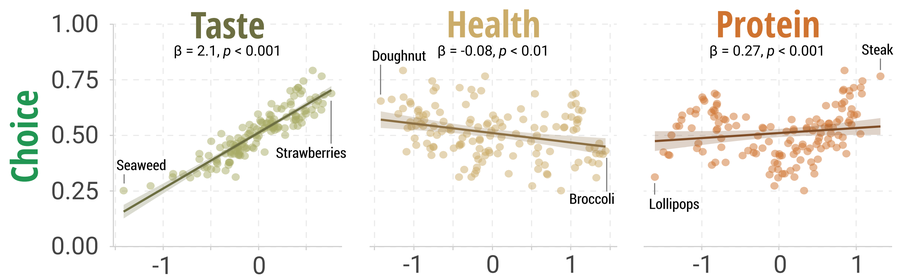
Factor 3: Protein/Savory
(***Protein***, filling, etc)

Ratings for each individual food item were averaged across subjects. Pairs of group-average ratings were correlated (far left).

Factor analysis of correlation matrix revealed the three latent factors that cut across food ratings (near left; circles show factor loading). Number of factors were determined by the CNG index.

Positive values are shown in red and negative values are shown in blue. Higher values are shown as larger and darker circles.

Food Choice

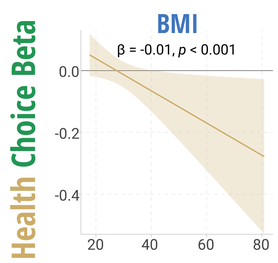


Food choice is largely based on taste

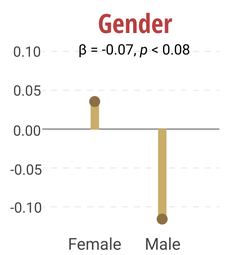
Foods that are chosen tend to be rated as tasty, unhealthy, or protein-rich

Used a mixed-effects linear regression model in R. Model included taste, health, protein ratings and interactions of each rating with BMI, gender, age.

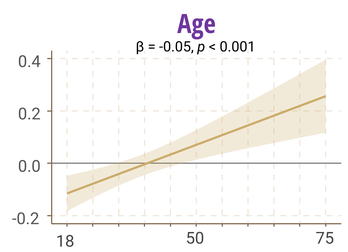
Choice of foods rated as healthy varies across individuals



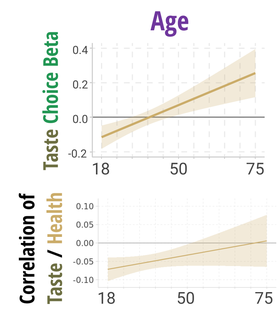
Individuals w/ lower BMI
Choose foods
Rated as healthy



Female individuals
Choose foods
Rated as healthy



Older adults
Choose foods
Rated as healthy



For older adults, foods rated as healthy are rated as more tasty

Conclusion

This population sample will be a valuable resource for future studies by providing a large set of food stimuli and ratings for understanding maladaptive eating behavior.

- Food ratings can be grouped based on
  - sensory (taste),
  - nutritional (health),
  - and protein (savory) information.
- In older adults, health and taste ratings are correlated (more aligned), suggesting a reduced need for self-control in eating behavior.