

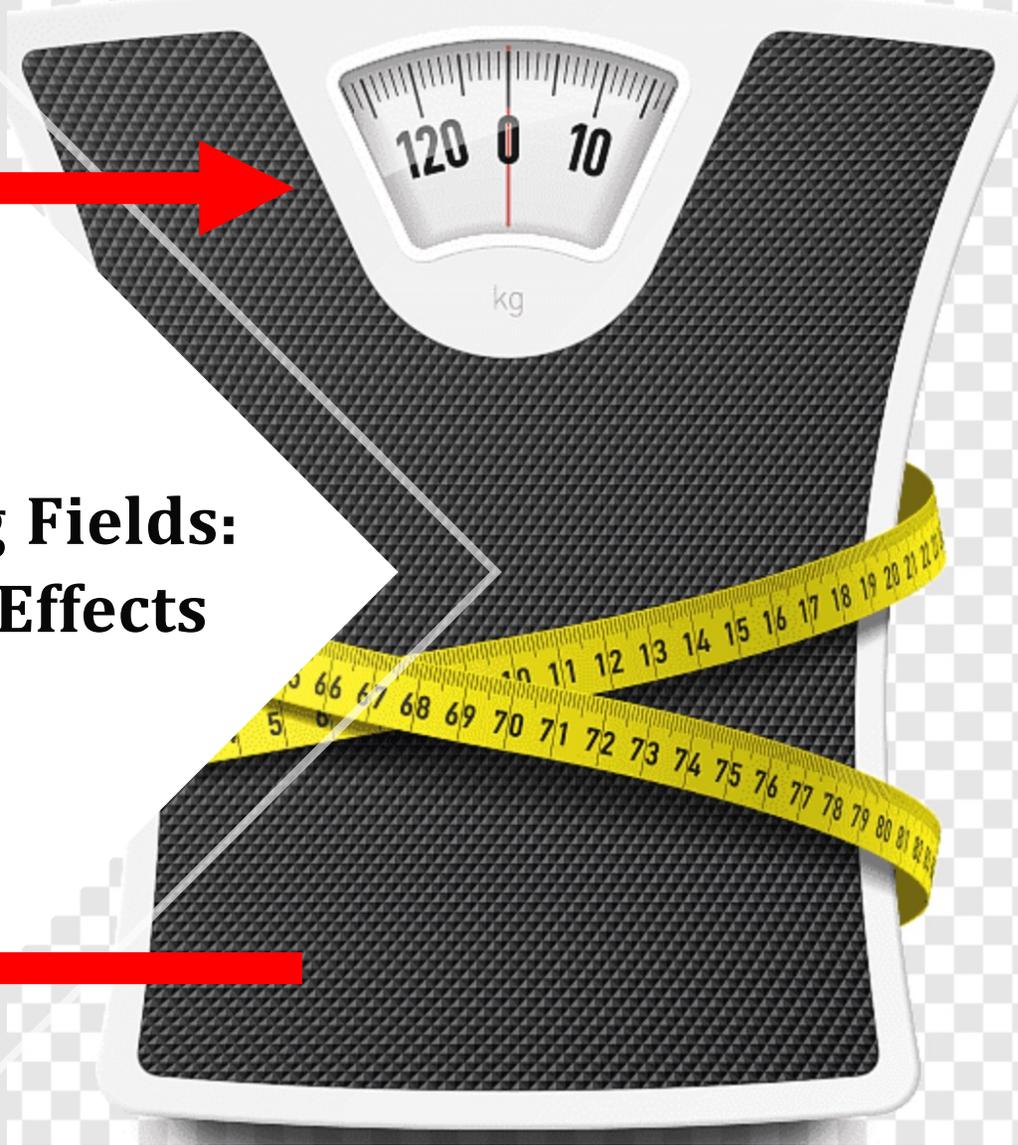
Crossing Fields to Make Scientific Connections: Reinforcement Processes in Addiction, Binge Eating, and Obesity

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Crossing Fields



**Crossing Fields:
Health Effects**





**Crossing Fields:
Reinforcement**



Reinforcement- Food?

Framework: Reinforcement Processes and Health



Prevention



Foundational



Prevention

- Reward-seeking behaviors:
 - Risky drinking
 - Binge eating
- Normative, dimensional
- Address sources of reinforcement?



Behavioral Activation

- Brief behavioral activation (Lejuez & Hopko, 2001)
- Environmental reinforcement
- Applications to substance use
- Prevention- college setting



BA in First-Year Seminar



- 5-year trial- NIAAA R01
- 36 course sections of UNIV 101 seminar
- Cluster-randomized to BA or control
- Assessments during and post-intervention, follow ups
- Outcomes, mechanisms

Fazzino et al 2020, *Contemp Clin Trials*);
Fazzino et al (*in press; Behaviour Change*)



Preliminary Findings- Mechanism

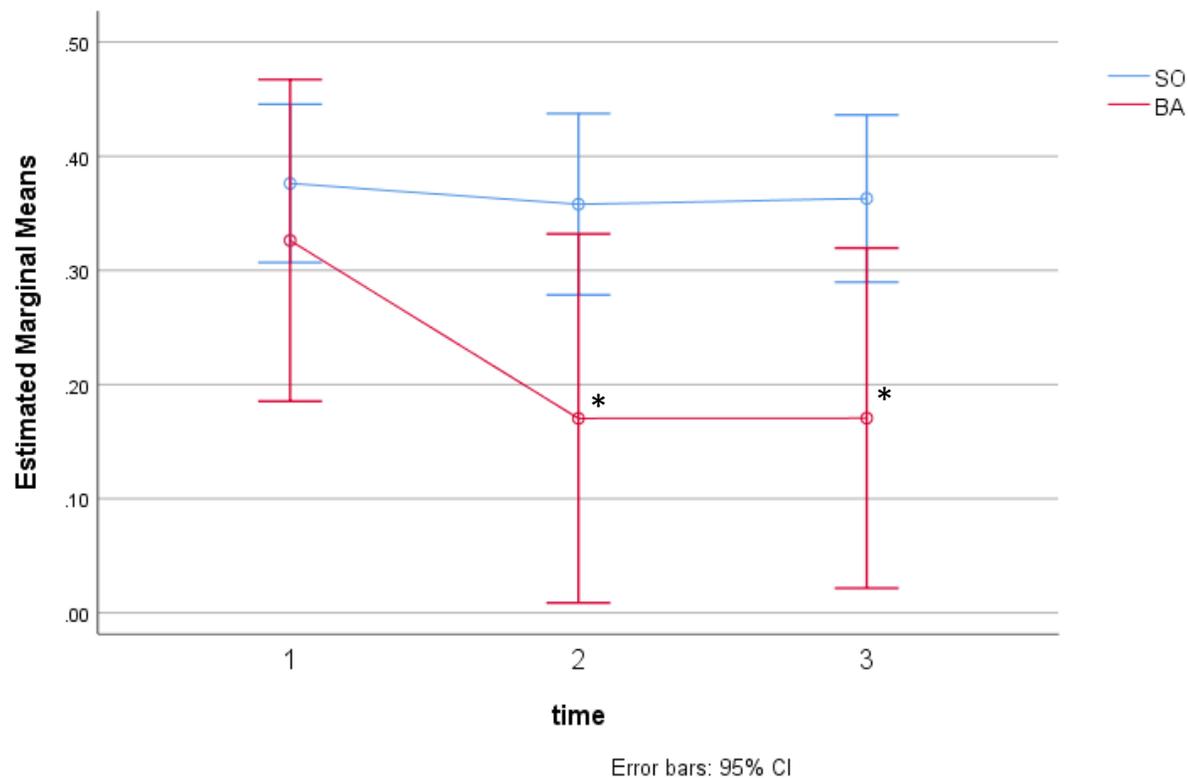
- Freshmen enrolled in 7 sections of UNIV 101 seminar
- Adolescent Reinforcement Survey Schedule- Alcohol Use Version (ARSS-AUV)
 - Proportionate reinforcement from alcohol

Demographic Characteristics (N=107)

| | |
|-------------------------------|------|
| Sex (% female) | 53% |
| Age (17-19 years old) | 100% |
| Race | |
| White, non-Hispanic | 60% |
| Asian | 8% |
| Black | 4% |
| Native American | 3% |
| More than one race | 14% |
| Other | 11% |
| Ethnicity (% Hispanic) | 11% |

Change during Fall Semester

Change in Proportionate Reinforcement from Alcohol



$F=4.180$; $p=.047$;
partial eta squared= .087



Work Ongoing

- Through 2024
- ~20 course sections remaining
- Stay tuned!



Framework: Reinforcement Processes and Health



Prevention



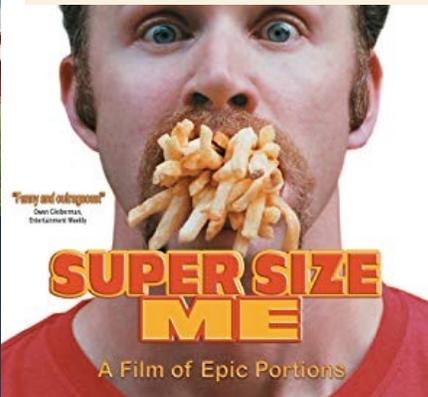
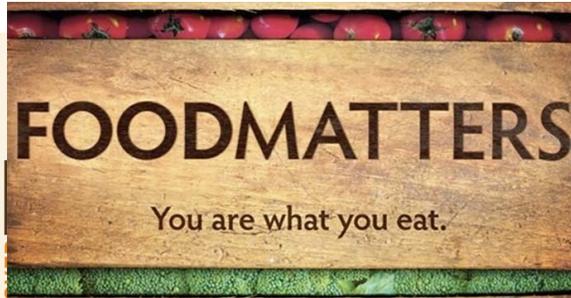
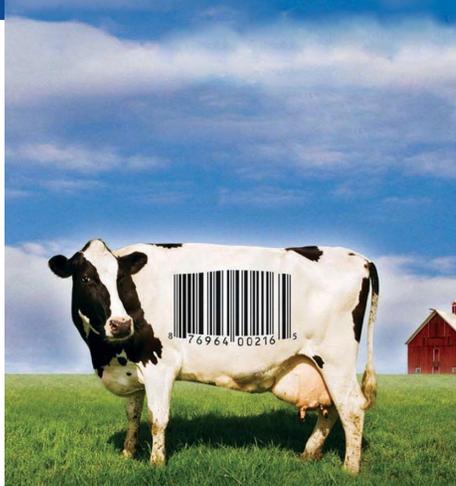
Foundational

Palatable Food Definition Problem

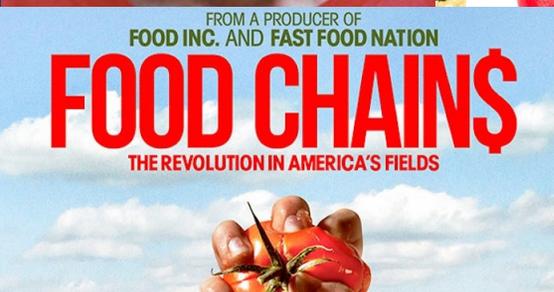
- No scientific definition
- Descriptive definitions (sweets, fats)



FOOD, INC



MICHAEL MOSS



FED UP



Hyper-Palatable Foods

- Hyper-palatable foods
 - Combinations of nutrients
 - Artificially enhanced eating experience
 - Slow engagement of satiety mechanisms
- Naturally occurring foods
 - Single palatability-related nutrient
 - Fiber, protein, water



What foods are Hyper-Palatable?

Examples:

- Snack foods
 - Chips
 - Cookies
 - (most) US-produced crackers

- Meals
 - Cheeseburgers
 - Frozen meals

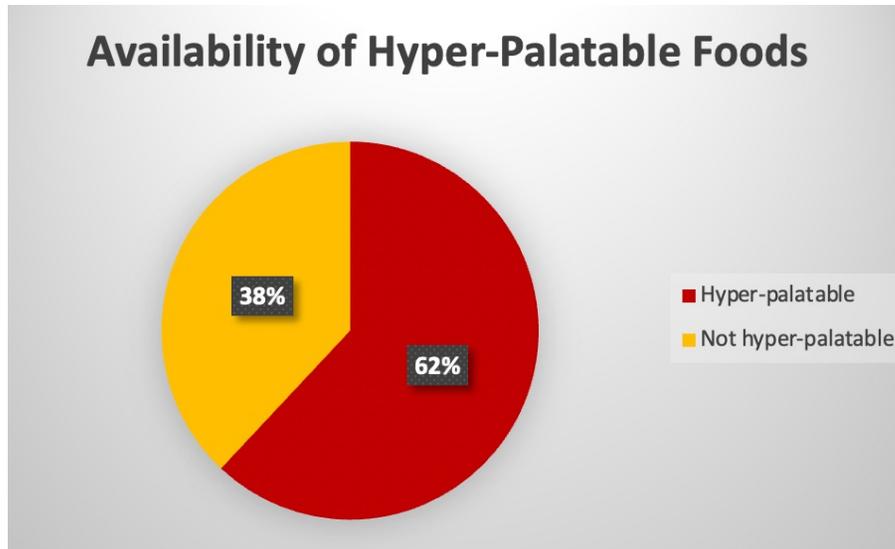
Hyper-Palatable Food Criteria

| HPF Group | % kcal fat | % kcal carb. | % kcal sugars | % sodium |
|---------------------------------|------------|--------------|---------------|----------|
| Fat and sodium (FSOD) | >25% | -- | -- | ≥0.30% |
| Fat and sugars (FS) | >20% | | >20% | -- |
| Carbohydrates and sodium (CSOD) | -- | >40% | -- | ≥0.20% |

Criteria from Fazzino et al (2019) *Obesity*
 Note: criteria do not apply to liquids

Availability in US Food System

- Data representative of US food system



Fazzino et al (2019) *Obesity*

Construct Validity

Convergent validity

- >85% of fast food/fried items and sweets/desserts

Discriminant validity

- 0% of fresh fruits, meats, and fish
- heavy cream (no added ingredients), unsalted nuts



Distinctness from existing constructs

- Energy density (~50% overlap)
- Ultra-processed foods (~60-70% overlap)

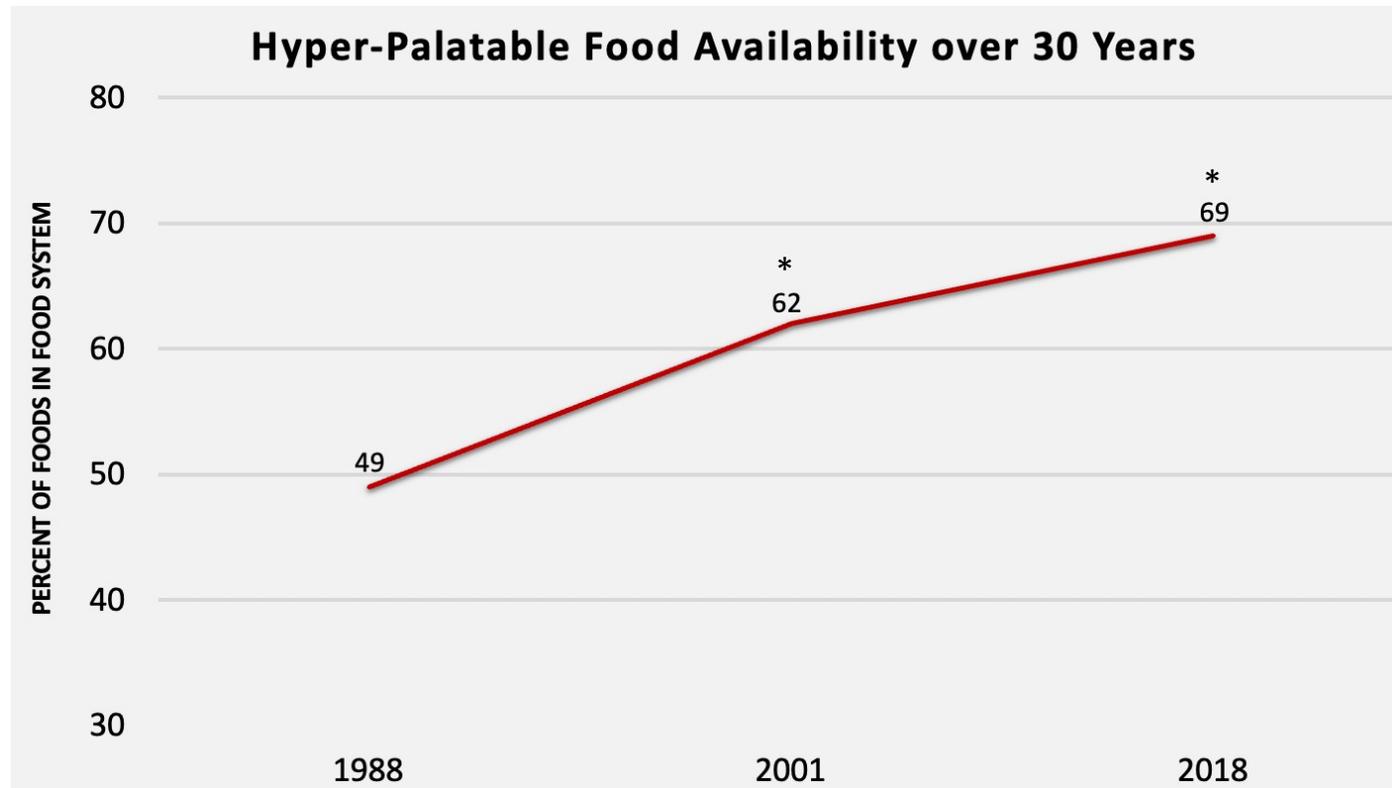
Fazzino et al (2019) *Obesity*; Fazzino et al (2021) *Appetite*



Behavioral Evidence

- Behavioral preference for hyper-palatable foods among healthy adults (Fazzino et al, *in press- Health Psyc*)
- Consumption during binge eating episodes- bulimia nervosa (Bjorlie et al, 2022; *Int J Eating Disorders*)
- Tendency to select and consume ad libitum- energy intake and weight gain (Fazzino et al, 2021)
- Mediator of within-meal energy intake (Fazzino et al, *under review*)

Change in Availability



(Demeke et al, *in press- Public Health Nutrition*)

Reformulation

- Foods in 2001 were >2 times more likely to be hyper-palatable compared to the same foods in 1988
- Foods in 2018 were >4 times more likely to be hyper-palatable compared to the same foods in 1988

| Change in Likelihood of Food Hyper-Palatability | | | |
|---|------------|---------------------|---------|
| Year | Odds Ratio | Confidence Interval | p value |
| 1988 | - | - | - |
| 2001 | 2.41 | 2.23 to 2.61 | <.0001 |
| 2018 | 4.09 | 3.75 to 4.46 | <.0001 |

(Demeke et al, *in press- Public Health Nutrition*)



Conclusions

- Substantial increase in hyper-palatable foods in US food systems from 1988 to 2018
- Evidence that foods were reformulated to be hyper-palatable
- US food environment- saturated by HPF
- How did we get here?

Changes in the US Food System

- Changes in food supply and technology
- Reach of food corporations nationally and globally
- Changes in food industry practices

A PORTFOLIO THAT FITS CONSUMERS' LIVES

| | FOOD & COOKING INTEREST | | | | | HOLIDAY ENTHUSIASTS | | ENGAGERS | | |
|-------------------------|-------------------------|--------------------|--------------------------|--------------------|---------------------|--------------------------------------|----------------------------------|----------------------------|----------------------------------|-----------|
| FOOD & COOKING INTEREST | Cheese Interests | Recipes w/ Fruit | Recipe Seekers | Meat Interests | Breakfast Interests | X-mas Planners | 4 th of July Planners | Kraft Recipe Visitors | Site Action Takers | |
| | Appetizer Interests | Fish Interests | Dinner Interests | Snackers | Spicy Interests | Big Game Planners | Easter Planners | Spanish Language Consumers | Spanish Language Mobile Visitors | |
| | Planters Interests | Lunch Interests | Dessert Interests | Pizza Interests | Pasta Interests | Halloween Planners | Thanksgiving Planners | Kraft Propensity | Kraft Loyalists | |
| | Side Dish Interests | Entree Interests | Quick & Easy Recipes | Potato Interests | Condiment Lovers | Kraft Heinz HAND "KRAFTED" AUDIENCES | | Kraft Mobile Visitor | Socially Active | |
| | Recipes w/ Veggies | Grilling Interests | Salad Dressing Interests | Beverage Interests | Baking Interests | Budget Friendly | Healthy Living | Kid Friendly | Party & Entertaining Enthusiasts | |
| | FOOD & COOKING INTEREST | | | | | LIFESTYLE ATTRIBUTES | | | | ENGAGERS |
| | | | | | | | | | | LIFESTYLE |





Same Playbook

The Perils of Ignoring History: Big Tobacco
Played Dirty and Millions Died. How
Similar Is Big Food?

KELLY D. BROWNELL and KENNETH E. WARNER

Yale University; University of Michigan



KU THE UNIVERSITY OF
KANSAS

Same Players?



PHILIP MORRIS

- UCSF Industry Documents Library



Extent of Involvement



- Early 1980's to present
- Kraft General Foods-
leader in US sales (1985+)
- >50% of revenue from food
(1989)



- Early 1970's to early 2000's
- Nabisco
- Largest market shares
- 25-30% of revenue from food

Fazzino (*in press*) *Current Addiction Reports*



Should we be concerned?

Phillip Morris 1986

Strategic goals.

Answers will have to be formulated to questions like

- A. Do we want to base the long-term growth of our business exclusively on tobacco products ?
- B. Or do we want to satisfy the customer needs with a product that may, but must not, be based on tobacco; that may, but must not, burn and produce smoke but which would be an ideal alternative to the cigarette for a current smoker ?
- C. Or are we looking for new types of products that appeal to smokers and non-smokers alike and which satisfy physiological and psychological needs similar to those satisfied by the cigarette ?

It is understood that products according to A, B, or C should suit themselves for mass production at a low or relatively low unit cost and will be discarded after consumption.

2501153384

Should we be concerned?

In the "flavor laboratory" at the Del Monte research and development center, Don Winter experiments with a new flavor formula. He is assisted by beverage technologist Janice L. Ma.

Soft drinks' secret science

Beverages appeal to consumers through a complex system of taste, smell and appearance. The ideal, Winter says, is "to leave people wanting more." 

Product Shot (Snacking) (46)

Our second platform, snacking, capitalizes on the high growth of between meal eating occasions. Within the U.S., snacking has become our fourth meal. Several of our divisions will capitalize on this growth in 2000.



Research Evidence?

Analysis

Tobacco industry involvement in children's sugary drinks market

BMJ 2019 ; 364 doi: <https://doi-org.www2.lib.ku.edu/10.1136/bmj.l736> (Published 14 March 2019)

Cite this as: *BMJ* 2019;364:l736

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Transferring Racial/Ethnic Marketing Strategies From Tobacco to Food Corporations: Philip Morris and Kraft General Foods

Kim H. Nguyen ScD, MPH, **Stanton A. Glantz** PhD, **Casey N. Palmer** RN, MS, and **Laura A. Schmidt** PhD, MSW, MPH

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Implications

- Food environment in which majority of foods are designed to take advantage of our neurobiology
- Policy regulation needed
- Change in ingredient levels (not removal of foods)



**Crossing fields:
Full circle**



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*Thank
you!*

Questions?

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