

Food Psychology: Why We Eat More Than We Think

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Speaker Disclosure

Board Member/Advisory Panel/Consultant

- **Present**

- Chic-fil-A, Sun-Maid Raisins, National Dairy Council, Tree Top Apples, Bush's Beans, United Sorghum Checkoff Board.

- **Past**

- American Heart Association Eat Well Task Force, California Raisin Marketing Board, Wonderful Pistachios, White Wave Foods, Davidson's Safest Choice Eggs

- **Honoraria**

- Honorarium underwritten by American Dairy Association –Indiana
- Dietitians of Canada, Exxon Mobil, Frito Lay, Midwest Dairy Council, Pennsylvania Nutrition Network, California Raisin Marketing Board, Alaska Tanker Company, Dairy Max, Texas AND, California AND, Florida AND, MINK, NY AND, South Carolina AND, Iowa AND, Nebraska AND, Manitoba Dairy Farmers, Dairy Farmers of Canada, Davidsons Safest Choice Eggs, National Dairy Council, New Products Conference, the Flavor Experience, BNP Media, and Cooper Vision.



INTERNATIONAL
FOOD INFORMATION
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Food and Health Survey 2016

**INTERNATIONAL FOOD
INFORMATION COUNCIL**

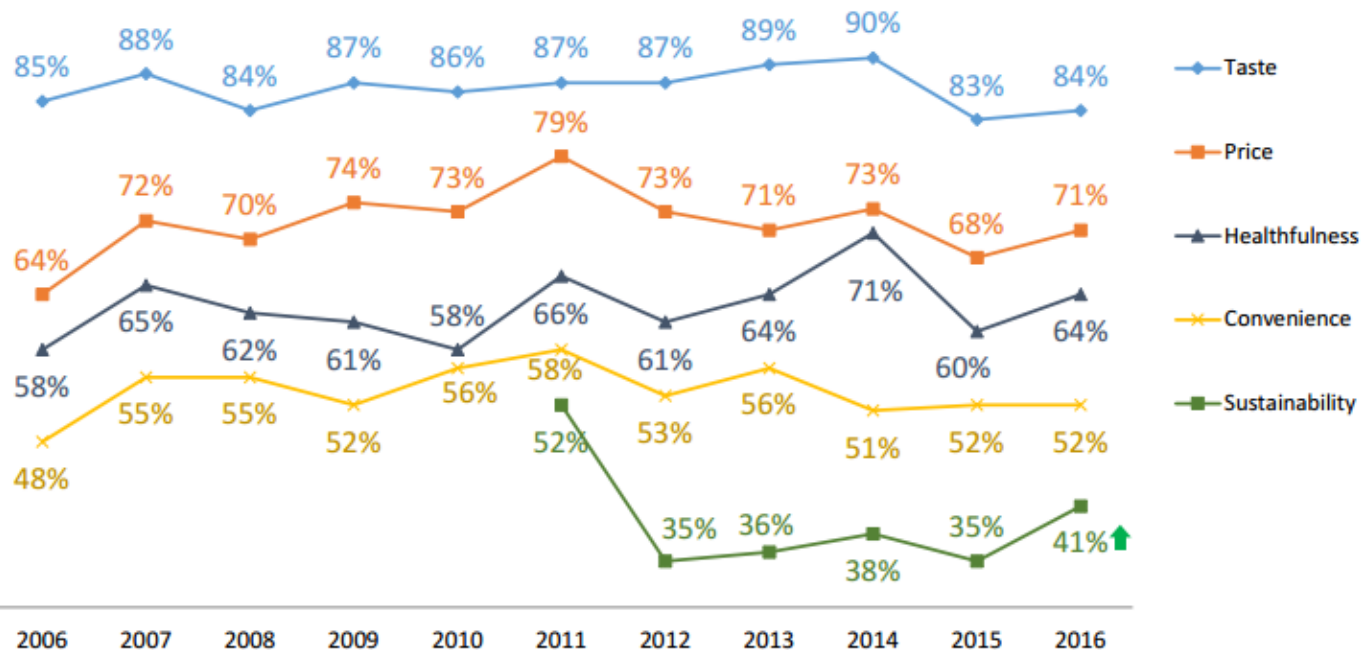
What Drives Consumer Choices?

IFIC 2016 Data

Taste continues to have the greatest impact on the decision to buy foods and beverages. Sustainability is up from 2015.

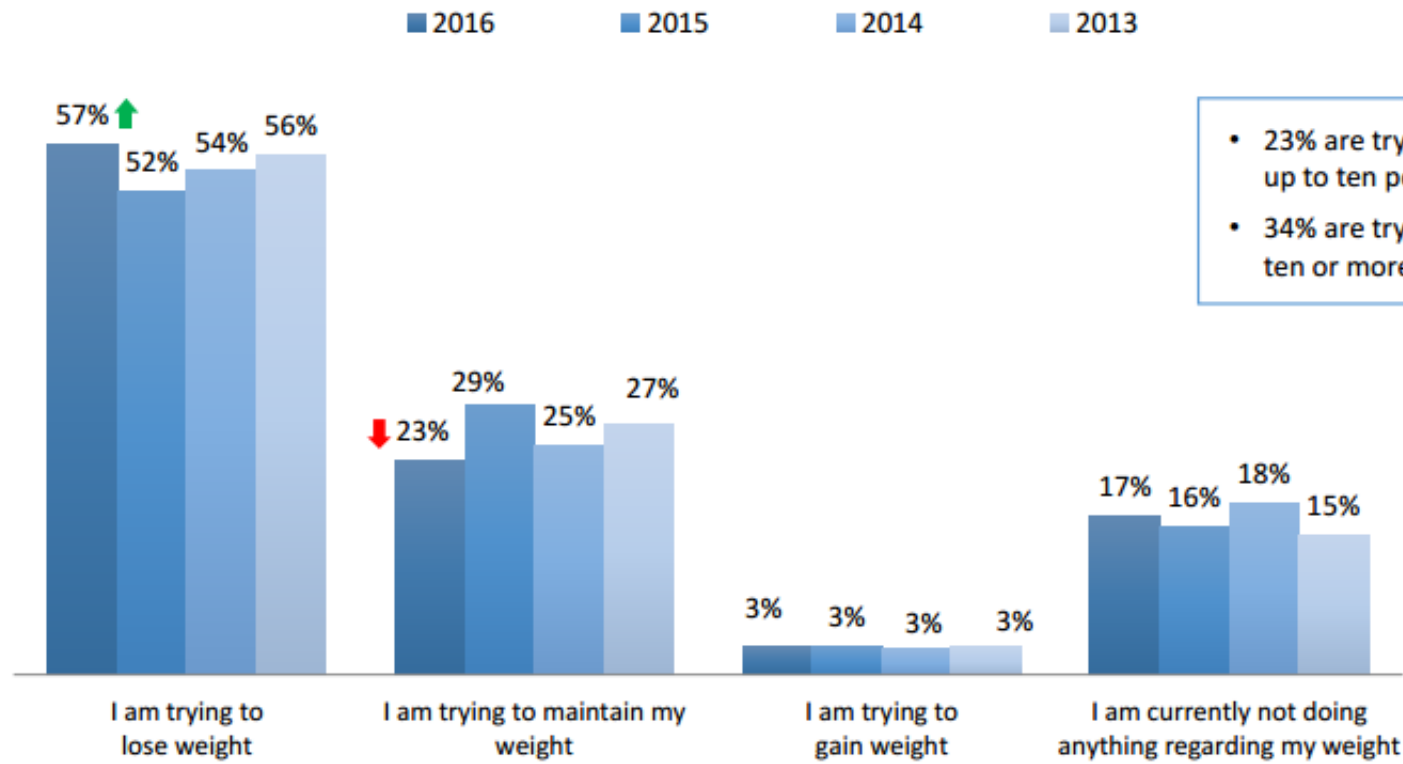


How much of an impact do the following have on your decision to buy foods and beverages?
 (% Rating 4 to 5 on 5-point scale, from No Impact to A Great Impact)



6 in 10 Americans are Trying to Lose Weight

Which of the following best describes what you are currently doing regarding your weight?

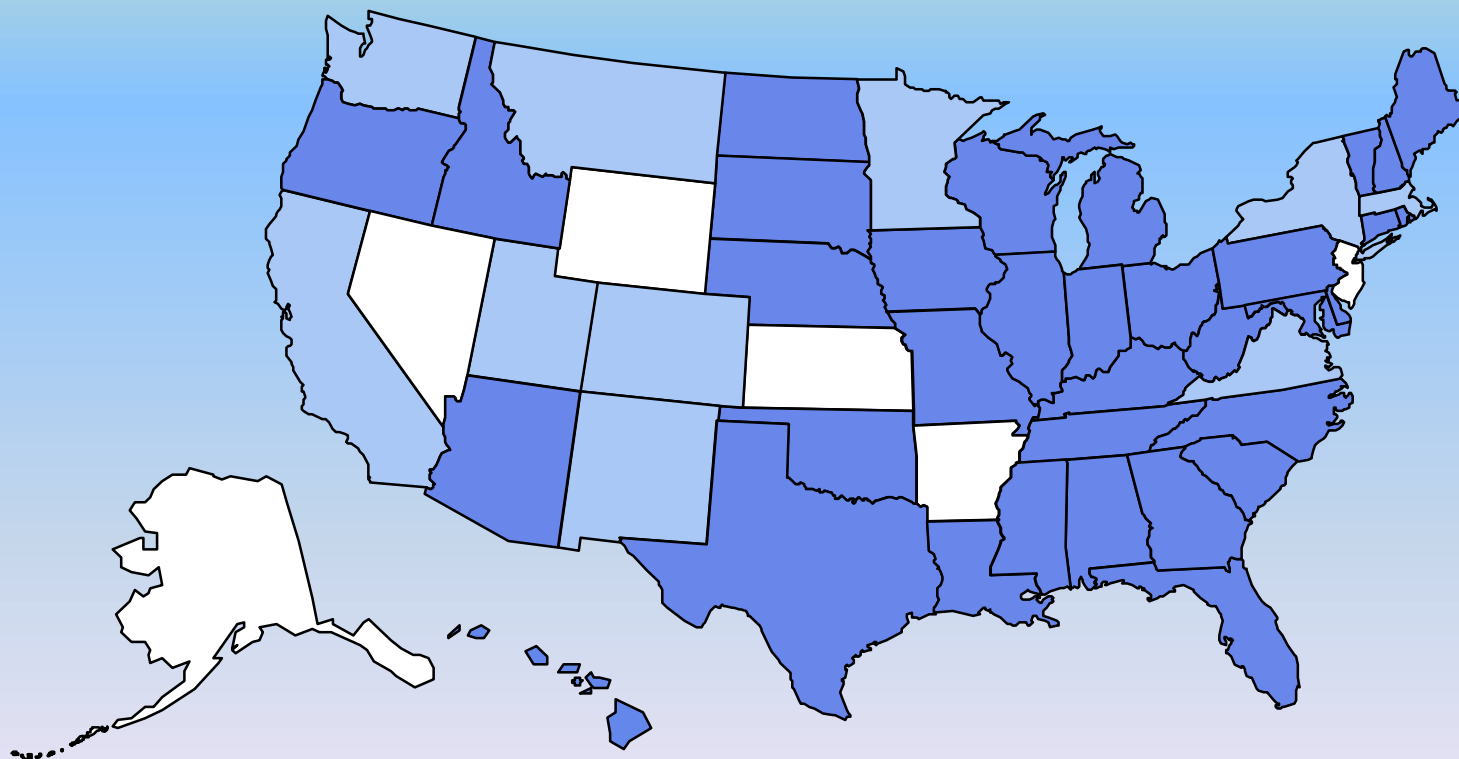


- 23% are trying to lose up to ten pounds.
- 34% are trying to lose ten or more pounds.

Obesity Trends

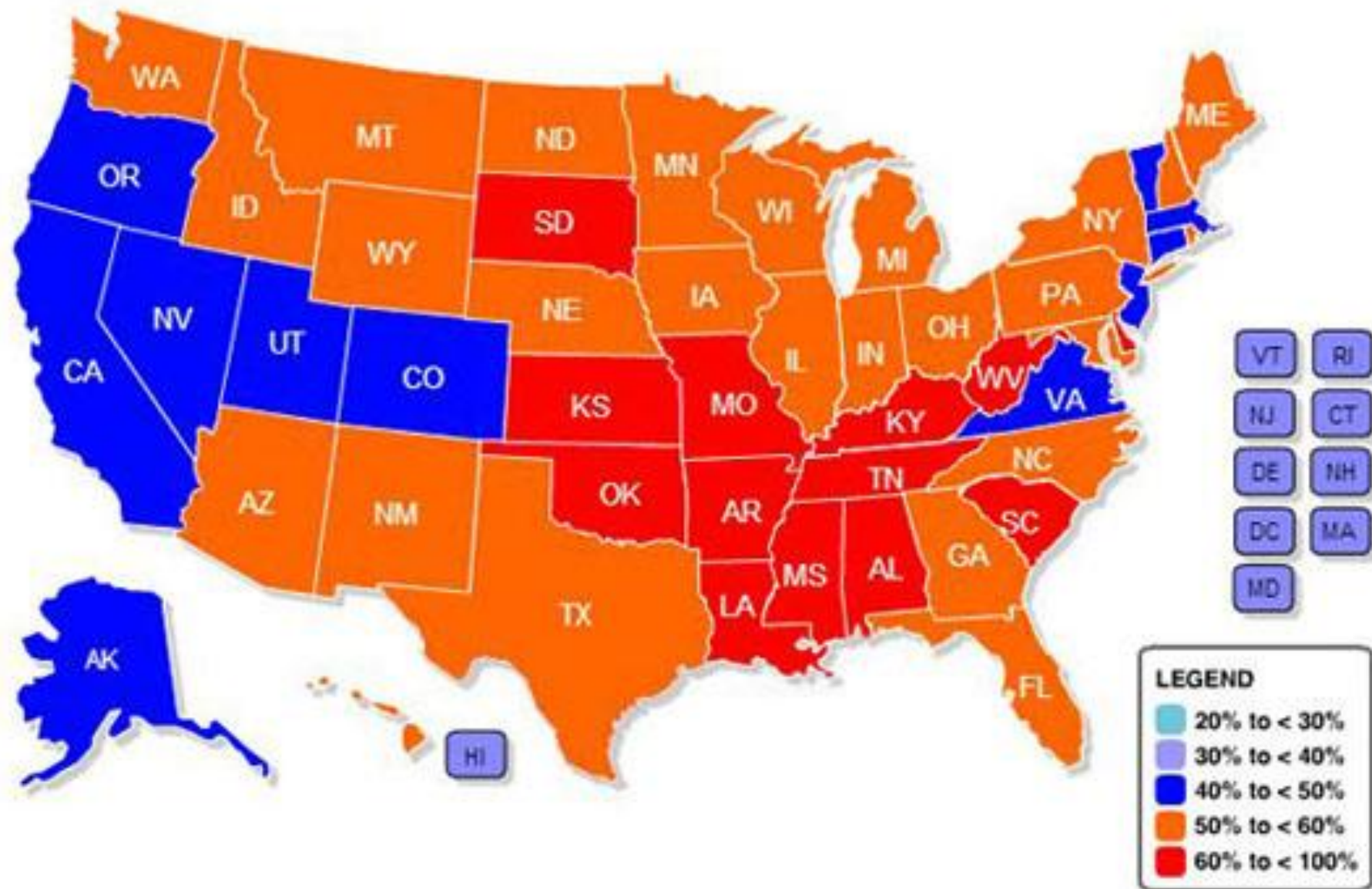
Obesity Trends* Among U.S. Adults BRFSS, 1990

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



□ No Data ■ <10% ■ 10%-14%

PROJECTED 2030 OBESITY RATES





Gary Foster Penn State ADA

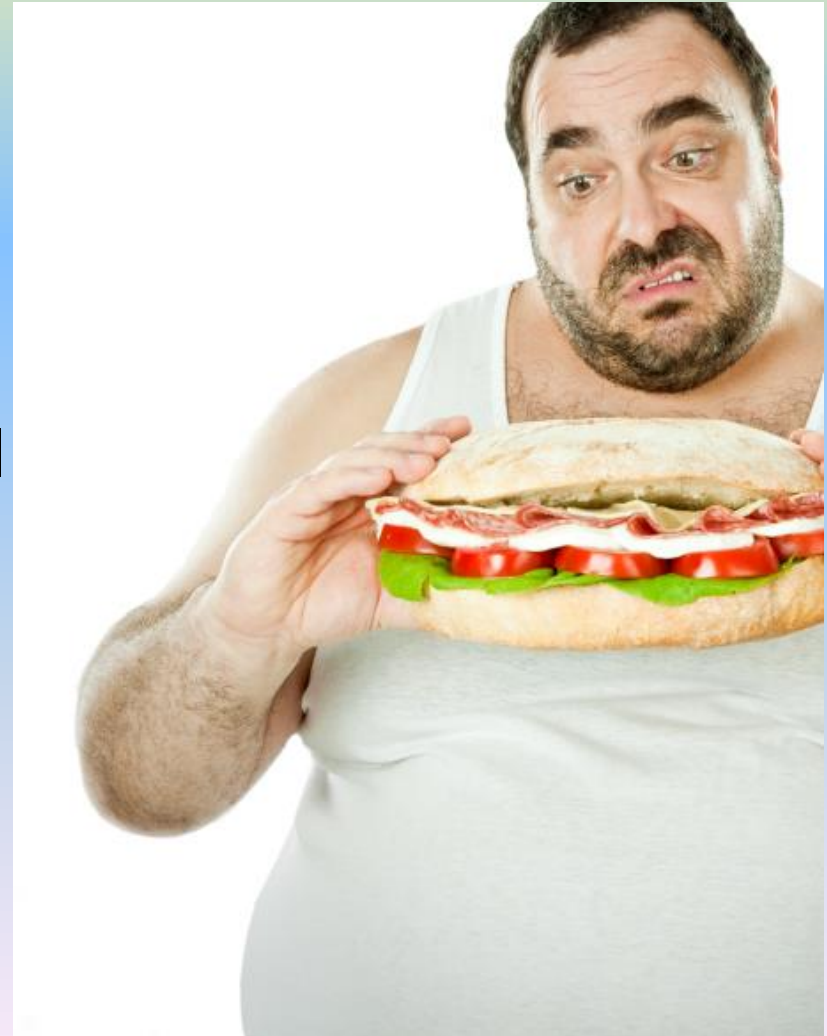
Are poor food choices the cause?

Why are Americans gaining weight

- I. Lack of exercise
- II. Sedentary lifestyles
- III. Stress/pressure
- IV. Advertising
- V. Genetic
- VI. Deep emotional needs, DR Phil
- VII. Haven't found the right diet

Premise for today!

- We lose track of how much we are eating



What Effect Consumer Choice?

1. Portion Size
2. Shape and Size
3. Visibility
4. Food Labels
5. Visual Cues

I. Portion size



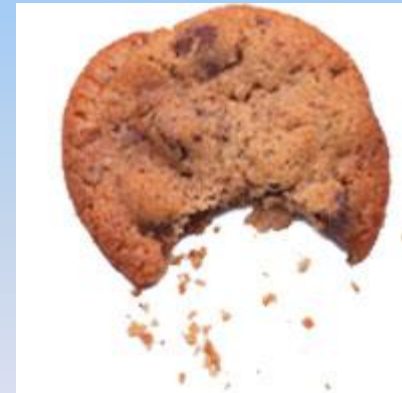
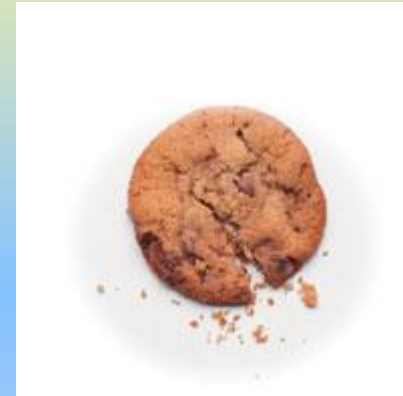
1. Restaurants

Historical Glance

<u>Food/Bev</u>	<u>Introduction</u>	<u>Size at intro(oz)</u>	<u>2002 sizes</u>
Budweiser	1936	7.0	7,12,22,40
Hershey bar	1908	0.6	1.6,2.6,4.0 7.0,8.0
BK fry	1954	2.6	2.6,4.1,5.7 6.9
McD burger	1955	1.6	1.6,3.2,4.0 8.0
Soda-BK	1954	12.0, 16.0	12.0,16.0, 22.0,32.0 42.0

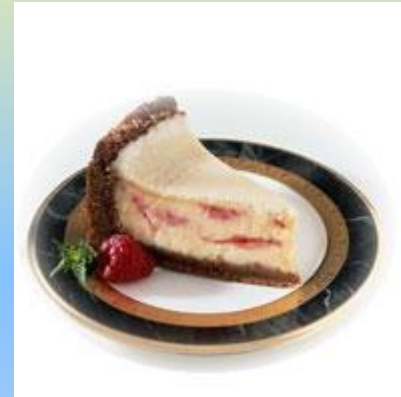
Then and Now... Cookies

- 20 years ago
 - 55 calories
 - 1.5 inch diameter
- Now
 - 275 calories
 - 3.5 inch diameter



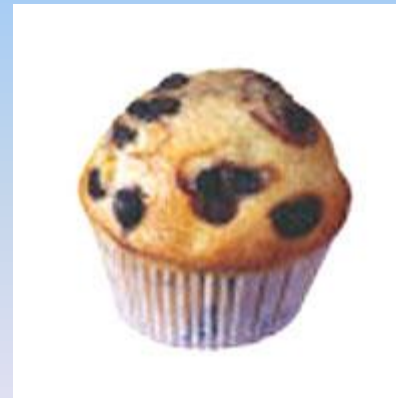
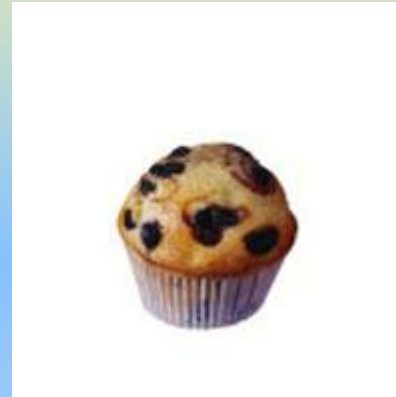
Then and Now.... Cheesecake

- 20 years ago
 - 260 calories
 - 3 ounces
- Now
 - 640 calories
 - 7 ounces



Then and Now.... Muffins

- 20 Years Ago
 - 210 calories
 - 1.5 ounces
- Today
 - 500 calories
 - 4 ounces



Then and Now...Bagel

20 years ago

- 3 in diameter
- 140 calories



Today

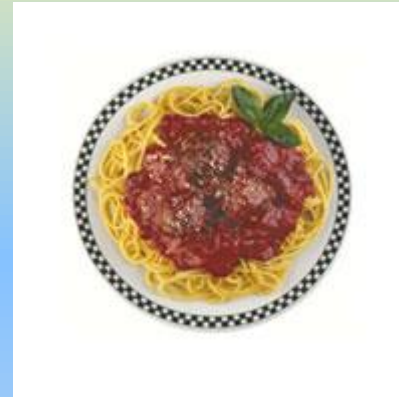
- 350 calories



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...Burger

20 years ago

- 333 calories



Today

- 590 calories

Monster Burger

- 1420 calories

- [Web video](#)

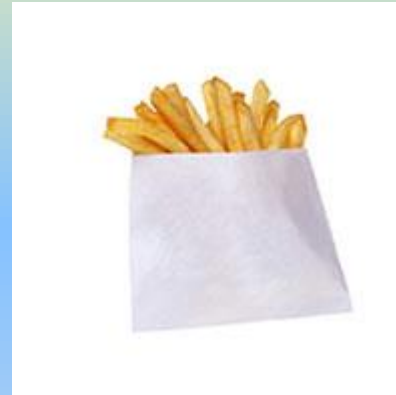
- [video](#)



Then and now...Fries

20 years ago

- 2.4 oz
- 210 calories



Today

- 6.9 oz
- 610 calories



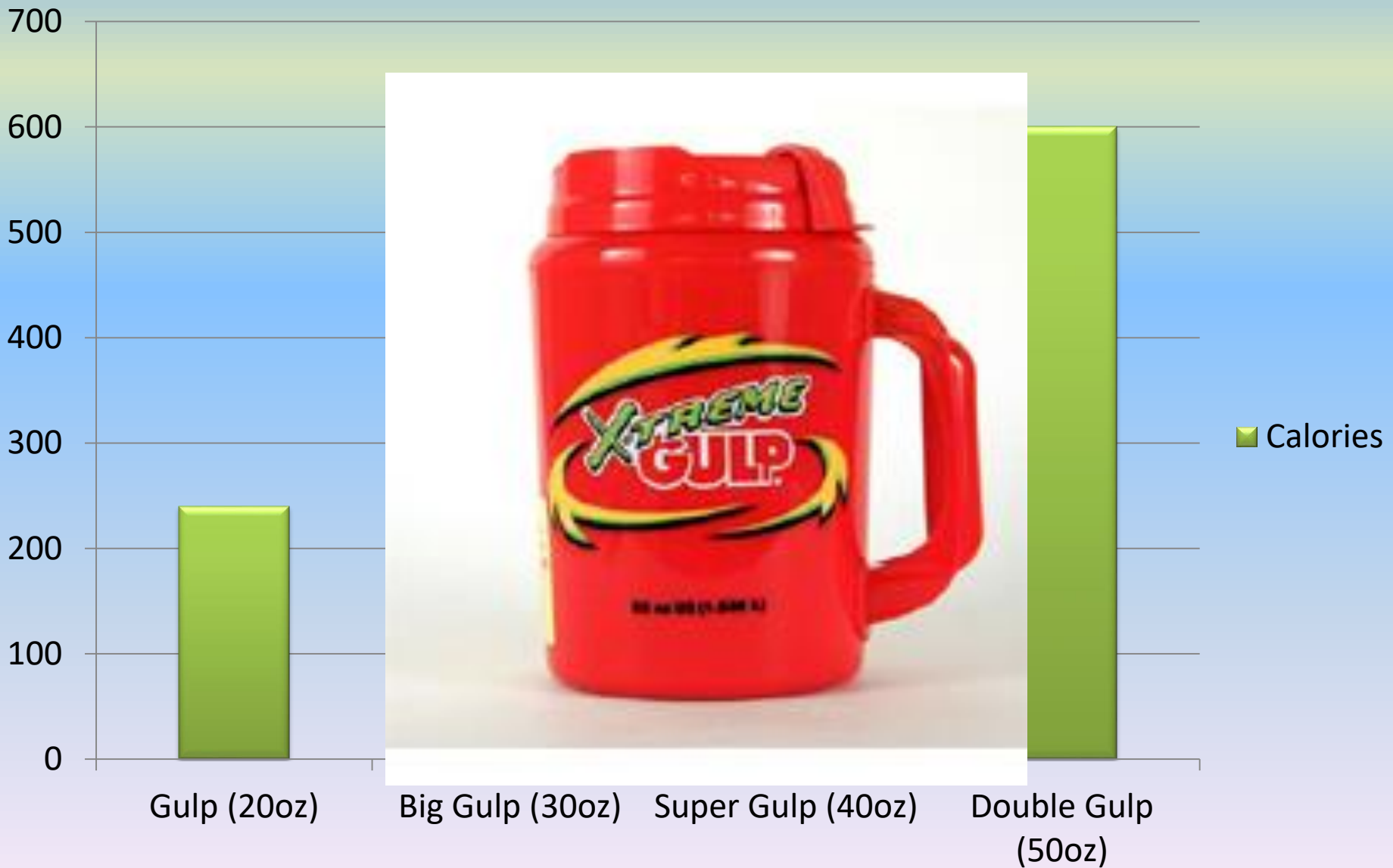
From the monster to the Riley burger



**From Riley to
more
madness**



Calorie Comparison of 7-eleven Coke-a-Cola



Legislation on Portion Sizes: Bloomberg

- New York state Supreme Court Judge Milton Tingling declared invalid Mr. Bloomberg's plan to prohibit restaurants, mobile food carts, delis and concessions at movie theaters, stadiums or arenas from selling sugary drinks in cups or containers larger than 16 ounces.
- Was to go in effect in March 2013



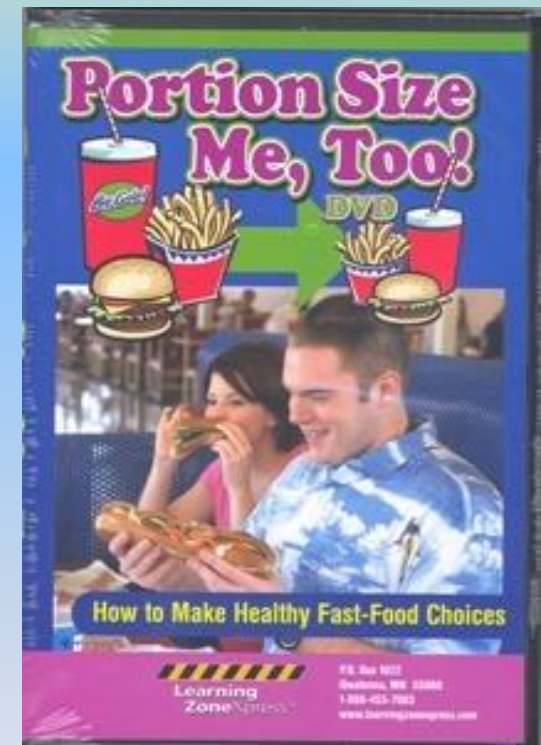
Other Trends

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



Super Size Me Documentaries

- [Portion size me](#)
- [Web video](#)



II. Size and Shape of Containers

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

CBS Features Portion Size Me

[video](#)

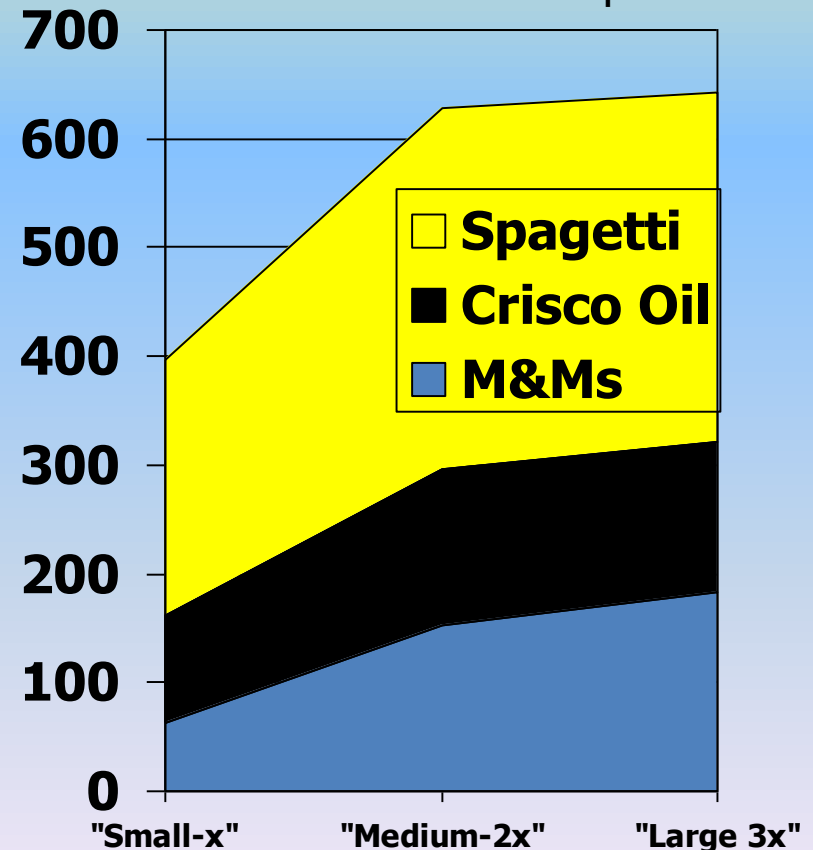


CBS NEWS

Package Size Increases Consumption

General Finding:
Package Size Can
Double Consumption

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



100 Calorie Packages

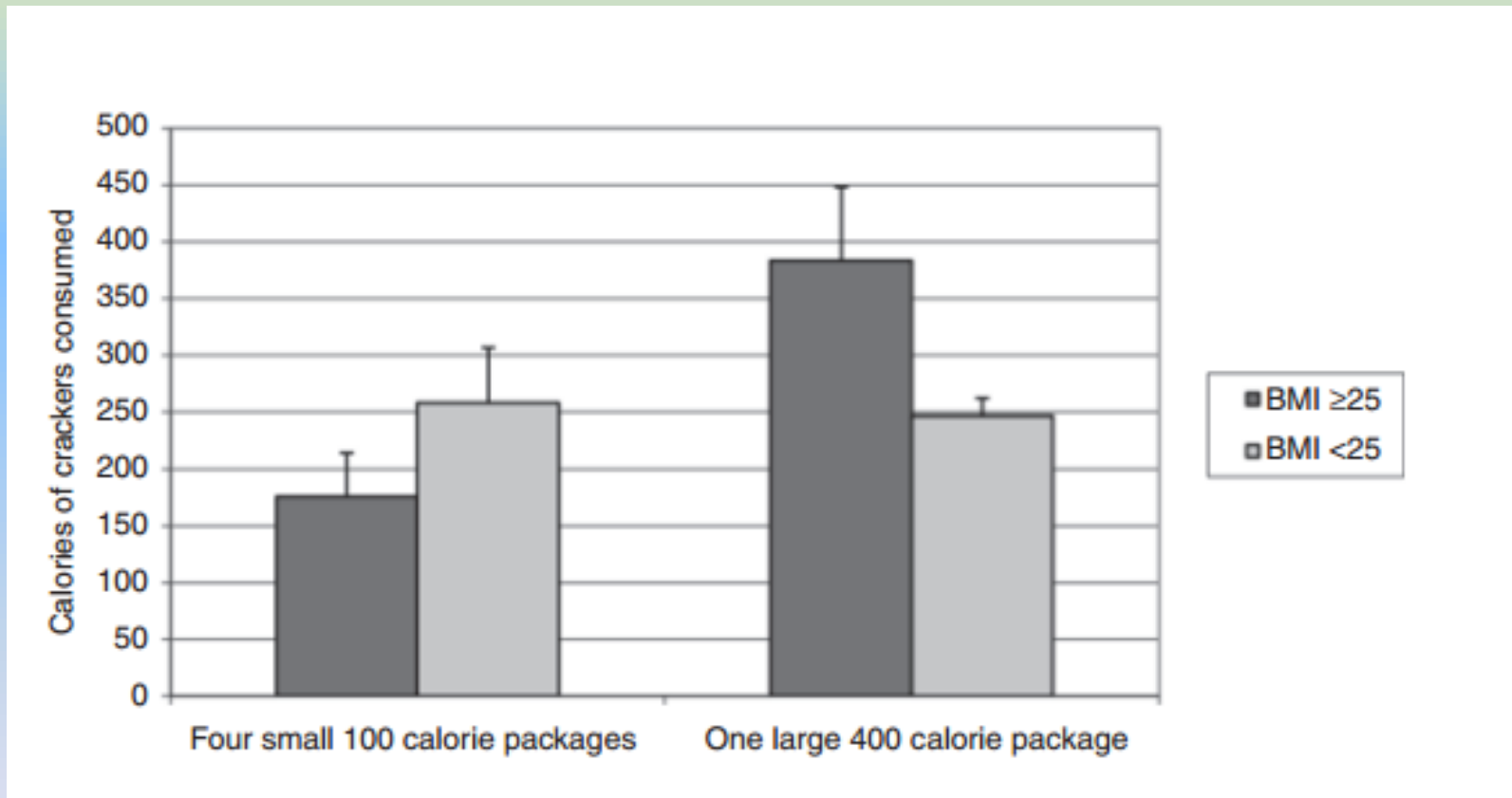


The 100-Calorie Semi-Solution: Sub-Packaging Most Reduces Intake Among The Heaviest

Brian Wansink¹, Collin R. Payne² and Mitsuru Shimizu¹

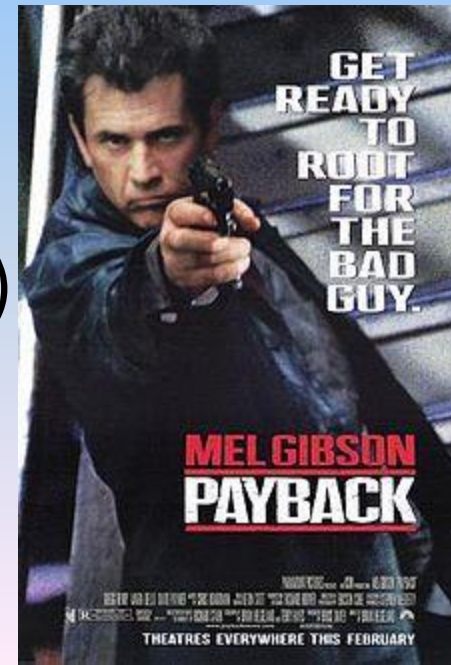
This study addresses two questions about sub-packaging: (i) Do 100-calorie packages reduce the calorie intake of overweight individuals differently than normal-weight individuals? (ii) Do they enable individuals to accurately track intake? Thirty-seven undergraduates were randomly given either four 100-calorie packages of crackers or one 400-calorie package of crackers to eat while watching television. The average participant ate 25.2% (75.1 calories) less when given four 100-calorie packages of crackers than when given one 400-calorie package ($P = 0.006$). In addition, much of this influence was driven by overweight participants whose intake decreased by 54.1%. However, all of the participants underestimated their consumption by 60% or more, indicating that sub-packaging does not appear to increase one's accuracy in estimating how much is consumed. Smaller sized sub-packaging most greatly benefits those who are overweight, yet it does so without making people more aware of how much they have eaten.

Calorie Intake as a Function of BMI and Packaging Conditions



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

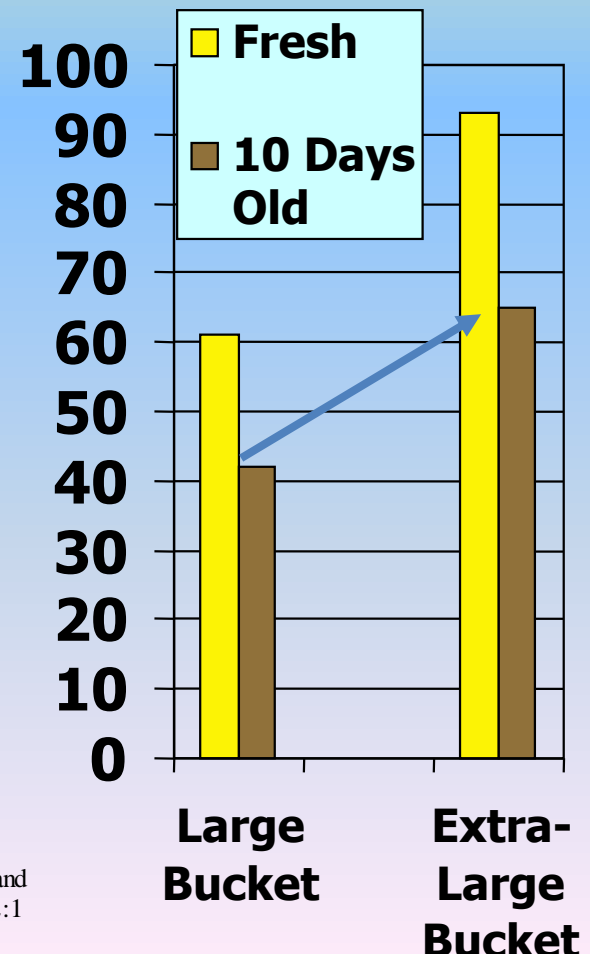


Wansink, Brian and SeaBum Park (2001), "At the Movies: How External Cues and Perceived Taste Impact Consumption Volume," Food Quality and Preference, 12:1 (January), 69-74.

We Eat Much More from Big Containers

Grams Eaten

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

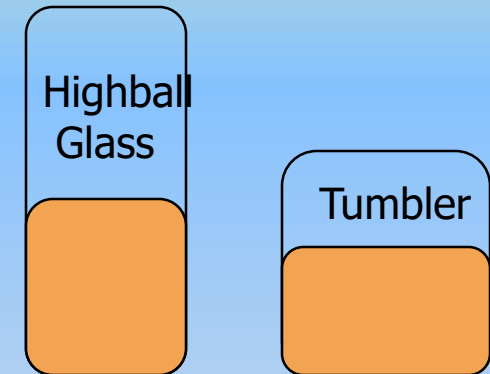




Do Peripheral Cues Influence Experts with Precise Target Volumes?

48 Philadelphia bartenders

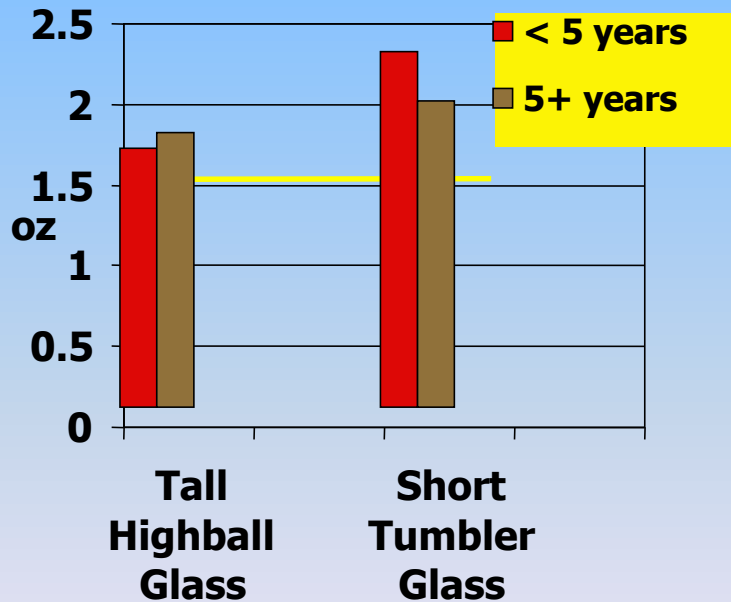
- Given 4 tall, slender (highball) glasses or 4 short, wide (tumbler) glasses
- Given 4 full 1500 ml bottles and asked to pour ...
- Split in to . . .
 - Less than 5 years experience
 - More than 5 years experience



Pour gin for gin & tonic
Pour rum for rum & Coke
Pour vodka for vodka tonic
Pour whiskey for whiskey/rocks

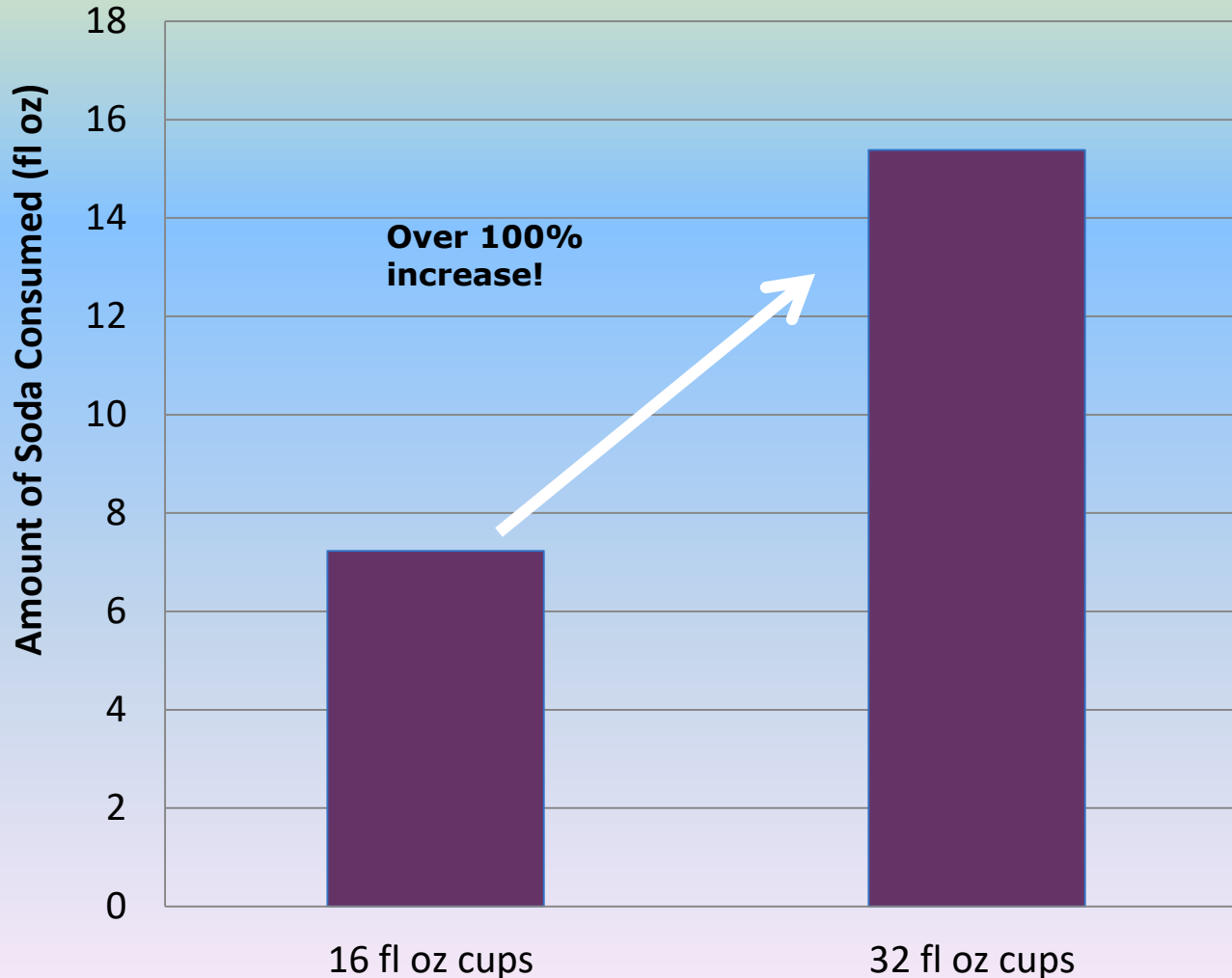
“When in Philadelphia, Should I Ask for a Tumbler or a Highball Glass?”

- Bartenders poured 28% more alcohol into tumblers than highball glasses
- Experience doesn't eliminate bias



Does Cup Size Increase Soda Consumption

Figure 1. Average Soda Consumption



The stay-slim food that costs pennies • A proven immune booster

SHAPE

SHAPE
YOUR
LIFE

5
SNEAKY
HABITS
THAT ARE
MAKING
YOU FAT
P. 96

BYE-BYE BELLY FLAB!

FOUR WEEK AB

MAKEOVER

Firm up your middle
for good in just
10 minutes a day

BLAST
400+
CALORIES

before breakfast

***Makeup
your skin
will love, p. 80**

JENNIFER
LOVE
HEWITT

"My #1
weight-loss
trick:
Burn the scale!"

BEAT THE JIGGLE

TAKE AN INCH OFF YOUR HIPS

3 moves that get
results FAST

Trust
your gut

This crash course
may save
your life, p. 146

HOME
HEALTH
REMEDIES
THAT REALLY
WORK

BONUS!

Lead a happier, healthier life
35-page special section (flip this issue over)>



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October 2009 Shape.com
Display until October 19, 2009



Prevent over-eating by focusing on the flavors of your food

last meal (like and texture) and less of the sn were offered who didn't. "F a recent meal the decision-n your brain," sa author Suzan Ph.D., a resear University of E

1 FOOL YOUR APPETITE

"The amount of food on a plate—whether it's one helping or four—is what most people consider a 'normal' serving," says Jim Painter, Ph.D., R.D., a food psychologist at Eastern Illinois University. His recommendation: **Downsize your dishes.** "If you have a visual cue that tells you to stop before you get stuffed, you'll eat less but feel just as satisfied."

2 SAY NO TO CRIME

You may want to record the latest episode of *CSI* or *24* so you can watch it *after* you finish dinner. "TV shows that feature

mortality," says Dirk Smeesters, Ph.D., an associate professor of marketing at Erasmus University in the Netherlands. "On a **subconscious level, this can make some people feel a little depressed or upset—which can then trigger them to eat more food than they normally would.**"

3 GIVE YOUR FORK A REST

Chowing down like it's an extreme sport can seriously up your calorie count, according to a new study from the University of Rhode Island. Researchers found that women with a body mass

England. "And that can brakes on mindless eat

5 WATCH YOU

In a study con Smeesters, pe were seated in front o ordered 19 percent le those who weren't. "**your reflection make aware of your body a weight-loss goals yo have,**" he says. "As a pay closer attention t of food you're eating plate away sooner." M across from your dini table? Sit in a chair th

III. The Effect of Visibility and Convenience on Dietary Consumption

- The Past Gas stations
 - All you buy was gas
- Now
 - You pass hundreds of foods to pay



RESEARCH QUESTIONS

- (1) Do people eat more when food is in sight?
- (2) Do people eat more when food is within reach?

METHODS

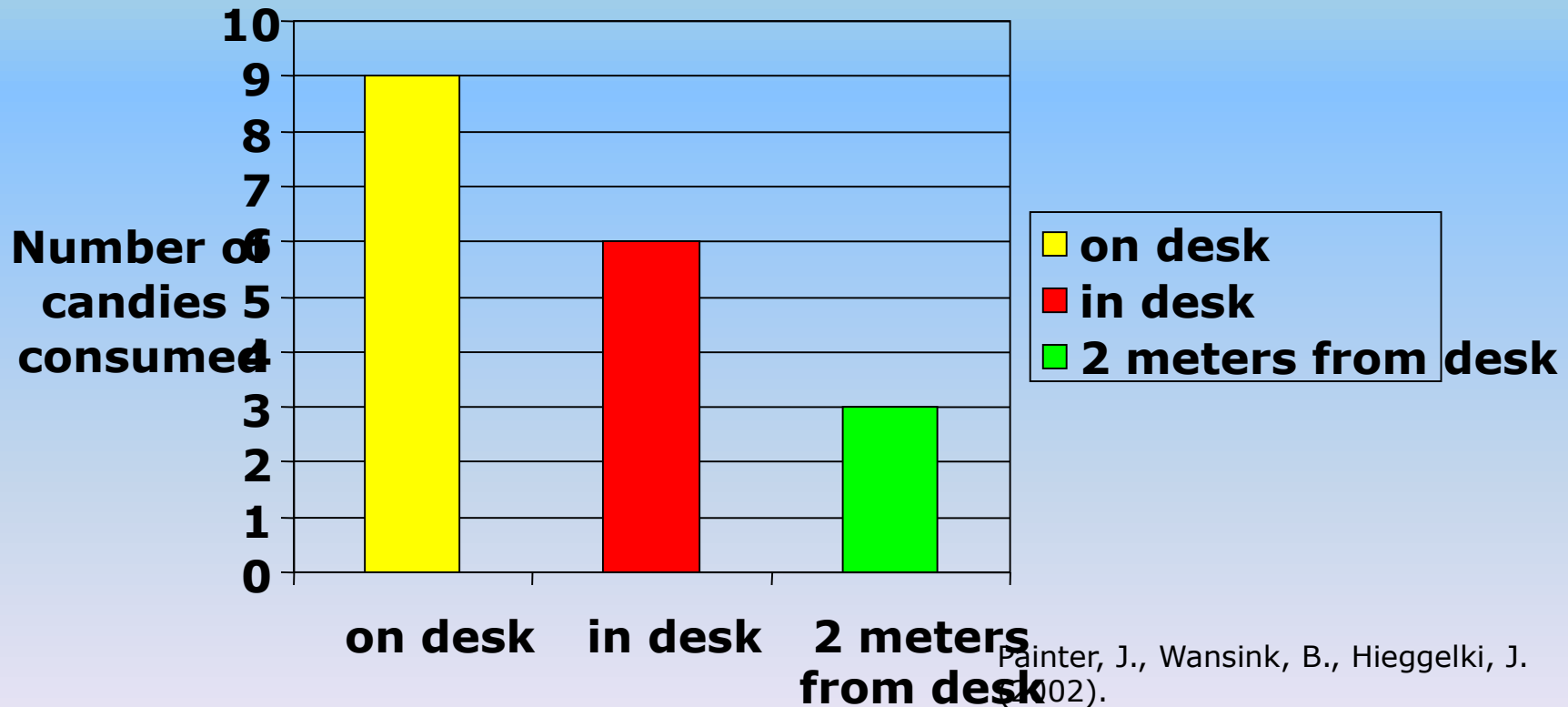
Intervention:

- Closed candy container containing 30 Hershey kisses replenished daily

Three conditions:

- on top of the desk (visible & convenient)
- in a desk drawer (not visible & convenient)
- away from desk (inconvenient)

AMOUNT OF CANDY CONSUMPTION ACCORDING TO CONDITION



Painter, J., Wansink, B., Hieggelki, J. (2002).
How Visibility and Convenience Influence Candy Consumption. *Appetite* 38, 237-238.

Would this be seen with other types of foods???

METHODS

Study design:

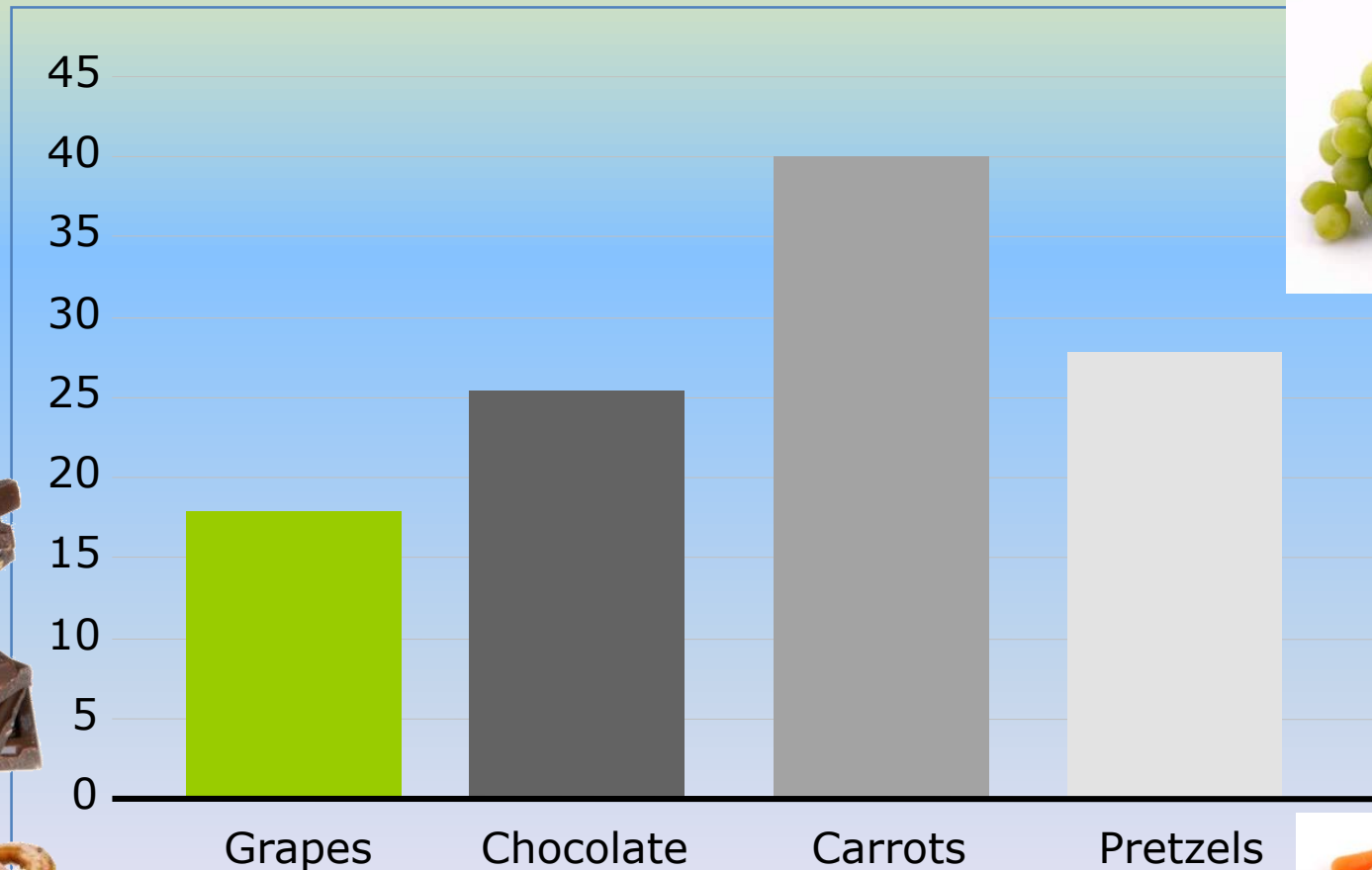
- Length of study: 3 weeks
- 2 days in each condition
- 4 foods, grapes, chocolate, carrots & pretzels, were placed in one of 2 conditions

Two conditions:

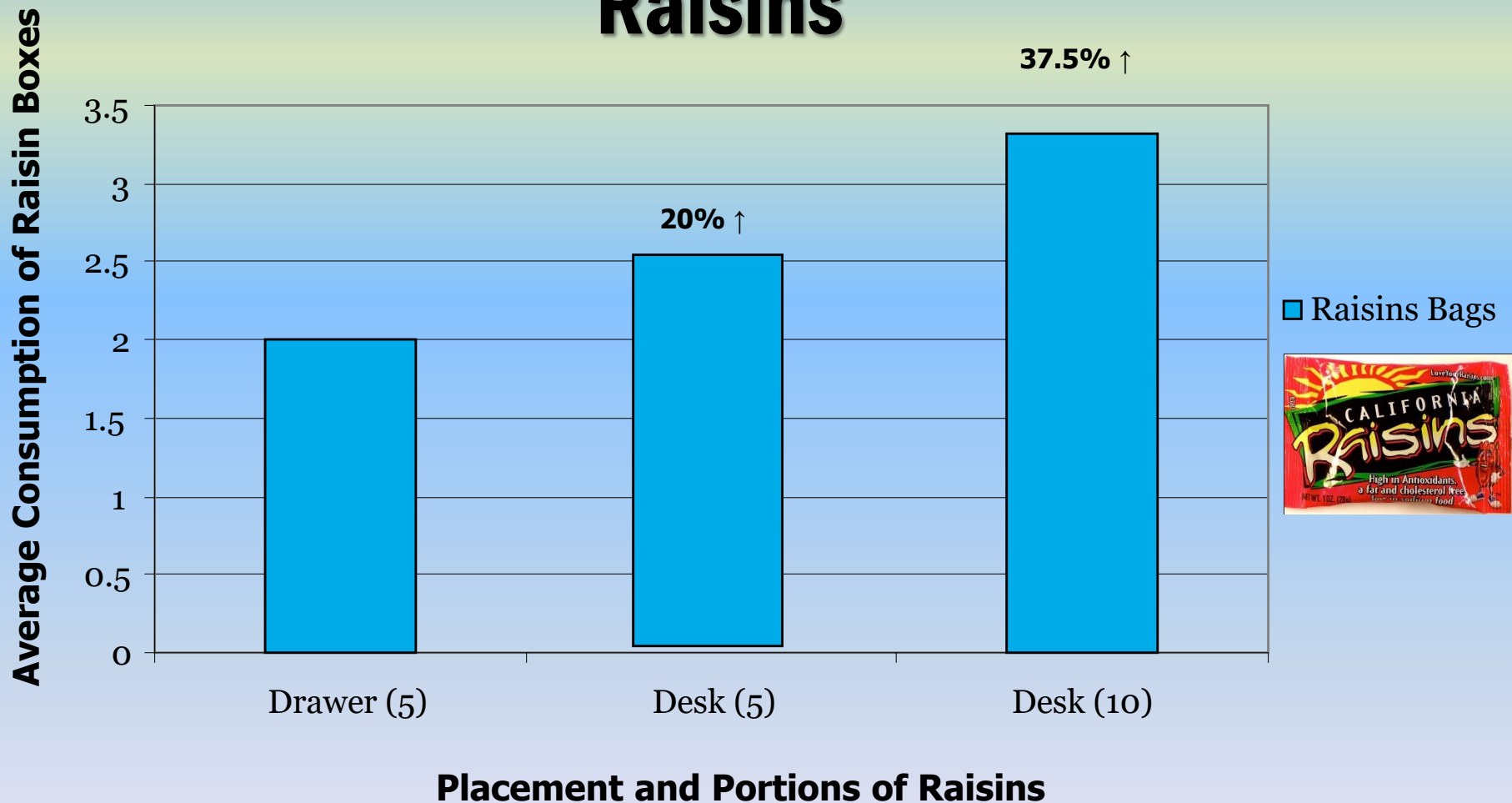
- On top of the desk (visible & accessible)
- In a desk drawer (not visible & inaccessible)

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

Percent increase



Accessibility and Visibility of Raisins



IV. Can Labels Change the Taste of Foods?

- Study 1. Descriptive Labels in the Cafeteria



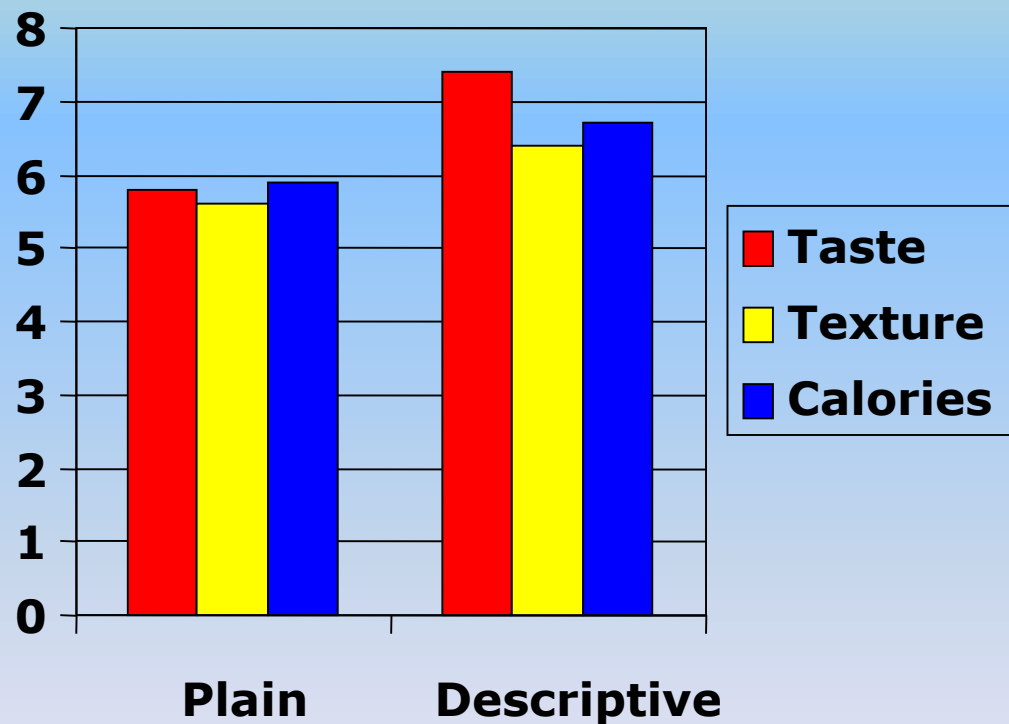
Menu Items Used

- Red beans & rice
- Seafood filet
- Grilled chicken
- Chicken Parmesan
- Chocolate Pudding
- Zucchini cookies
- Traditional Cajun Red beans & rice
- Succulent Italian Seafood filet
- Tender Grilled chicken
- Home-style Chicken Parmesan
- Satin Dutch Chocolate Pudding
- Grandma's Zucchini cookies

“Well, I know what I like”

--> **Maybe Not**

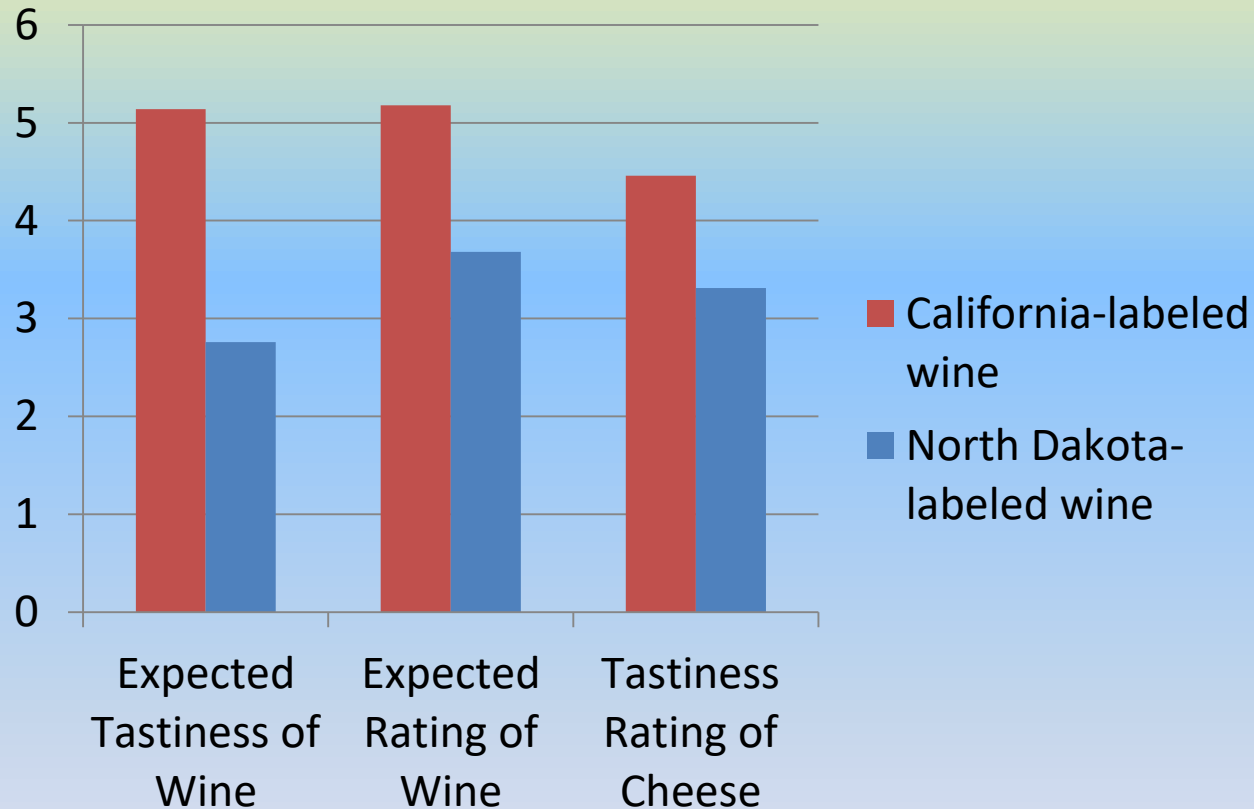
People evaluate
descriptive foods as
more favorable



Results: Effects are Less Strong with Desserts



Fine as North Dakota Wine



Wansink, B., Payne, C. R., & North, J. (2007). Fine as north dakota wine: Sensory expectations and the intake of companion foods. *Physiology & Behavior*, 90(5), 712-716. doi:10.1016/j.physbeh.2006.12.010

V. Visual cues

1. Soup
2. Pistachios

Soup Study

- Fifty-four participants (72% male)
- $\frac{1}{2}$ were give a normal bowl
- $\frac{1}{2}$ were give 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.

WHEN WILL YOU BE FULL?

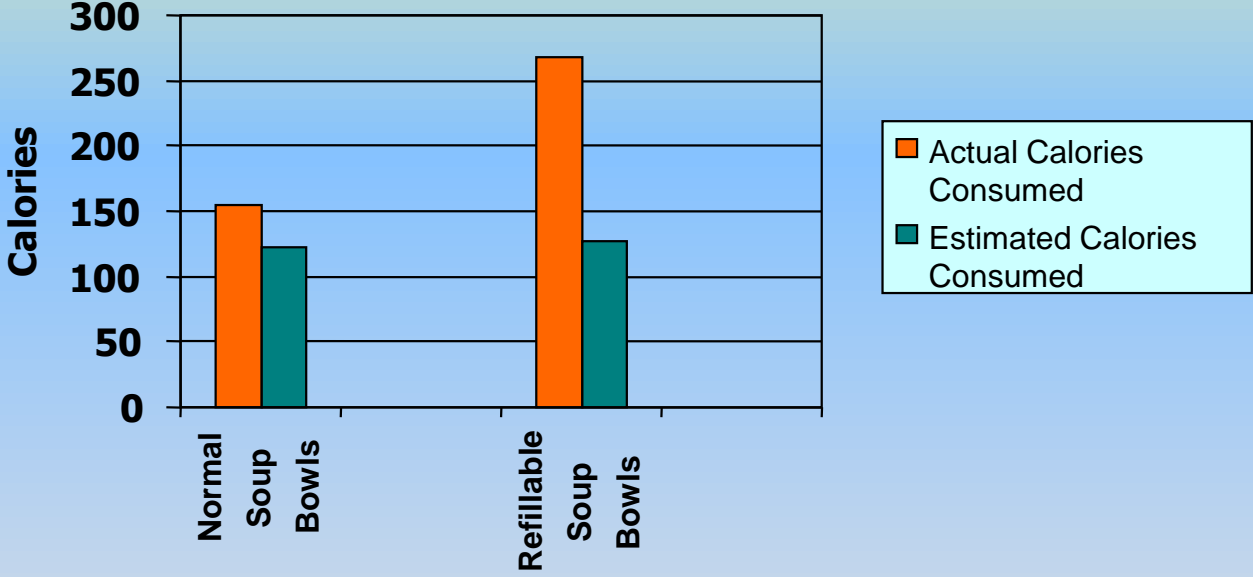
WHEN I REACH THE BOTTOM.

WELL, GOOD LUCK WITH THAT.



© Wazinski 2004

Refillable Soup Bowls Increase Consumption, but Not Perception of Consumption



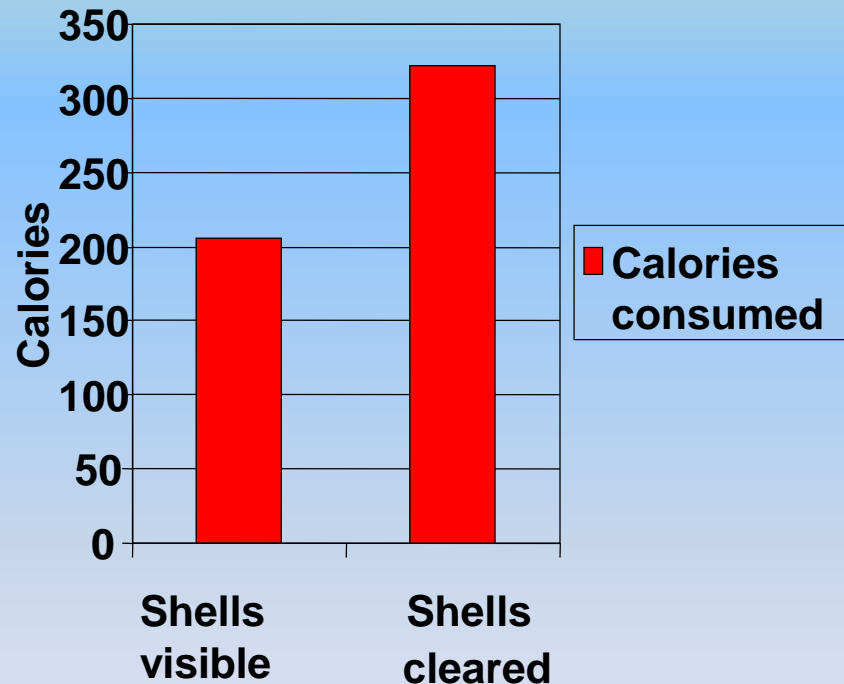
Wansink, B., Painter, J.E., North, J. 2005. *Bottomless Bowls: Why Visual Cues of Portion Size May Influence Intake*. *Obesity Research*, 13,1, 93-100.

Study 2

- Will the presence of the empty shells reduce consumption?
- Methods
 - Population 17 faculty & staff
 - Two conditions
 - Empty shells left on table (visible)
 - Empty shells were cleared
 - Duration 8 hours

Calorie Consumption Comparing Empty Shells visible to Shells Cleared

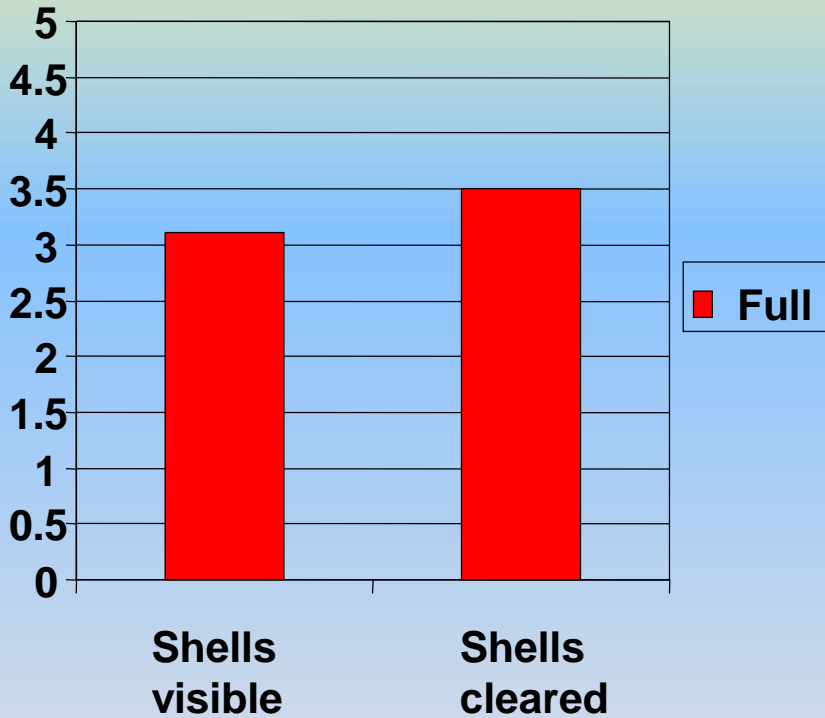
Differences were significant $p \leq .01$



An increase of 56% when shells were cleared

Satiety of Portions **

No significant differences, $P \geq .01$

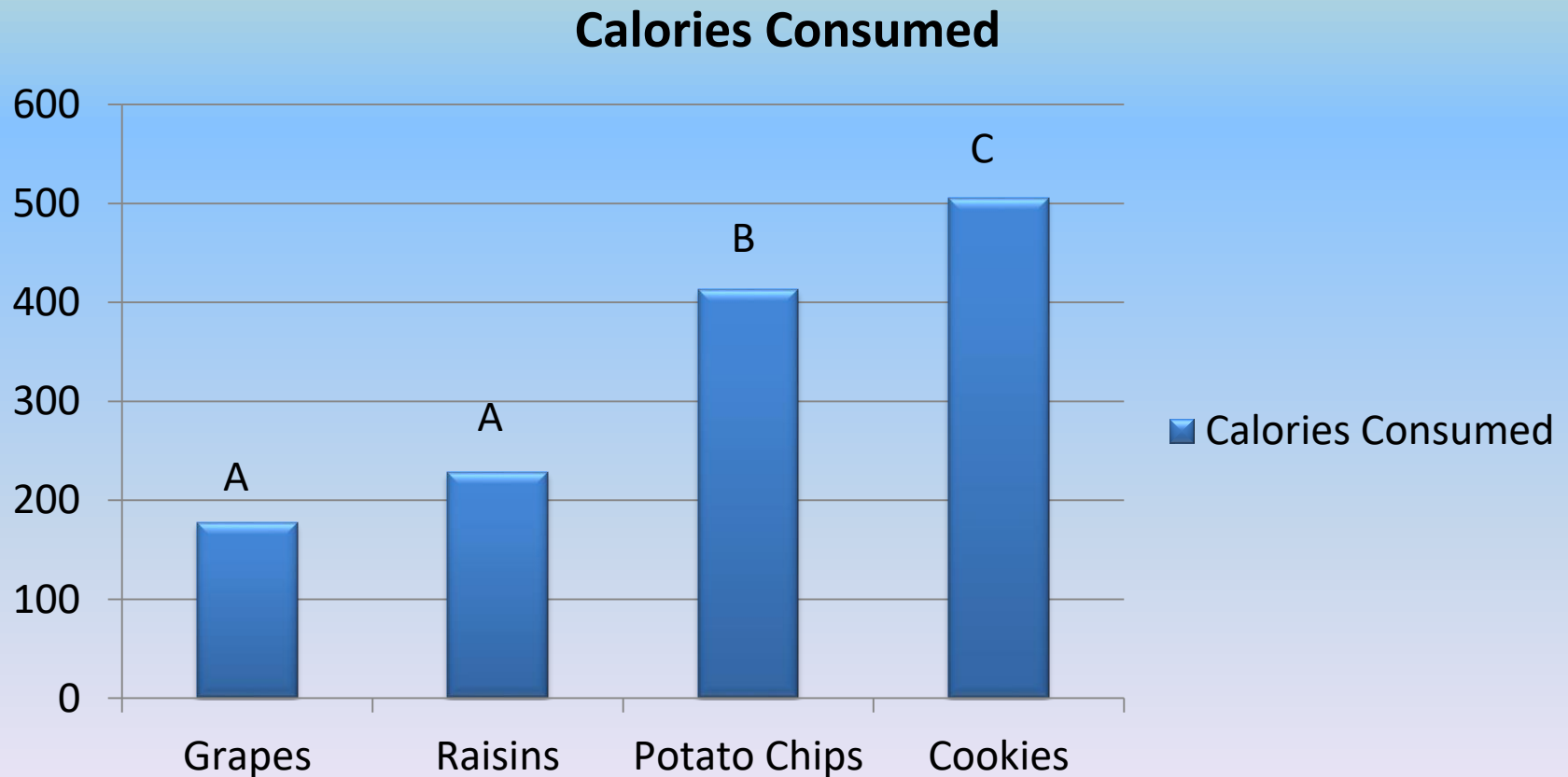


Even though consumption increased by 56%, there was no significant difference in satiety

** Fullness Scale (1) very Hungry – (5) very full

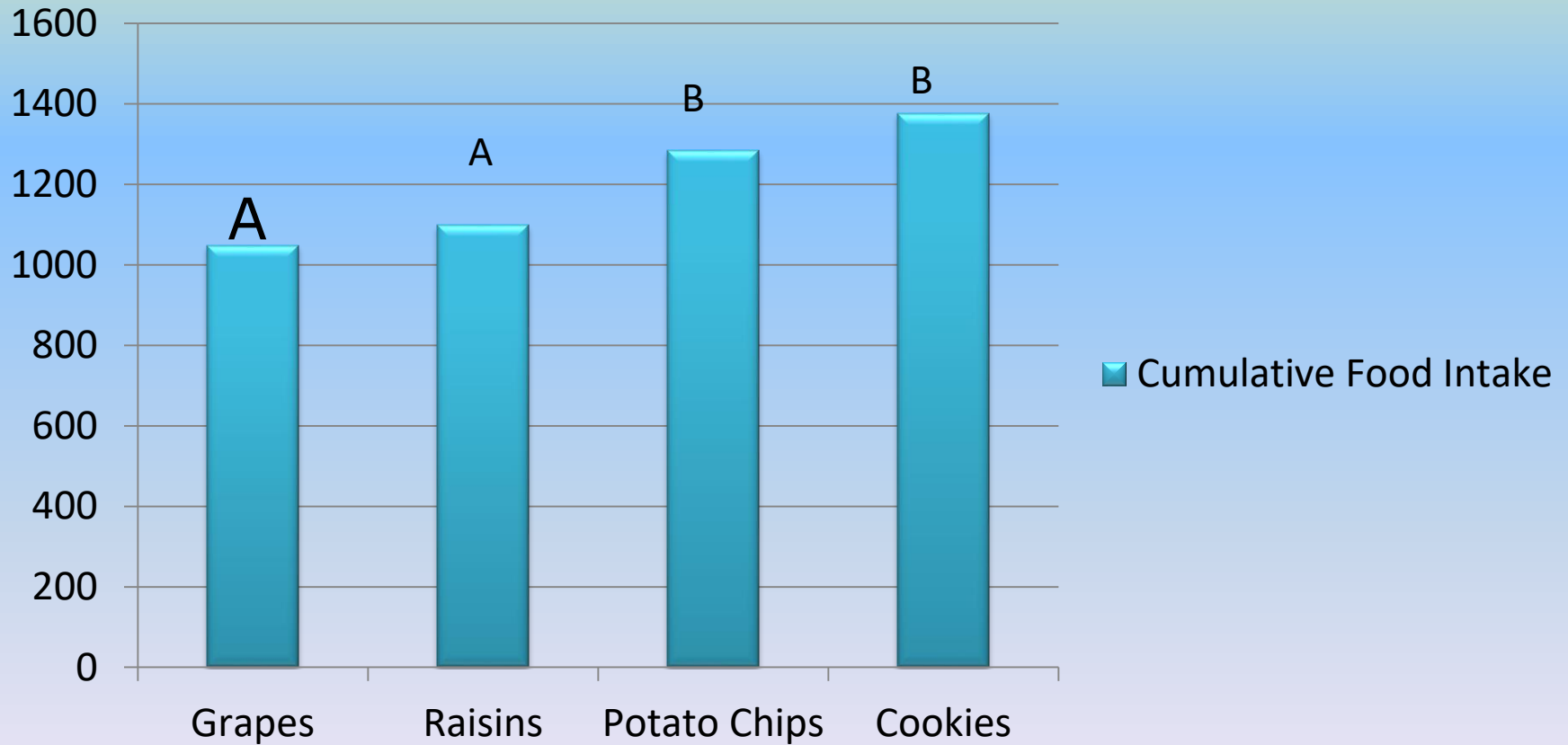
V. The effect of food selection on satiety & consumption

Snack intake (kcal) was lowest after grapes and highest after cookies, compared with all other snacks.



Cumulative energy intake was lowest after grapes and highest after cookies, compared to all other snacks.

Cumulative Food Intake



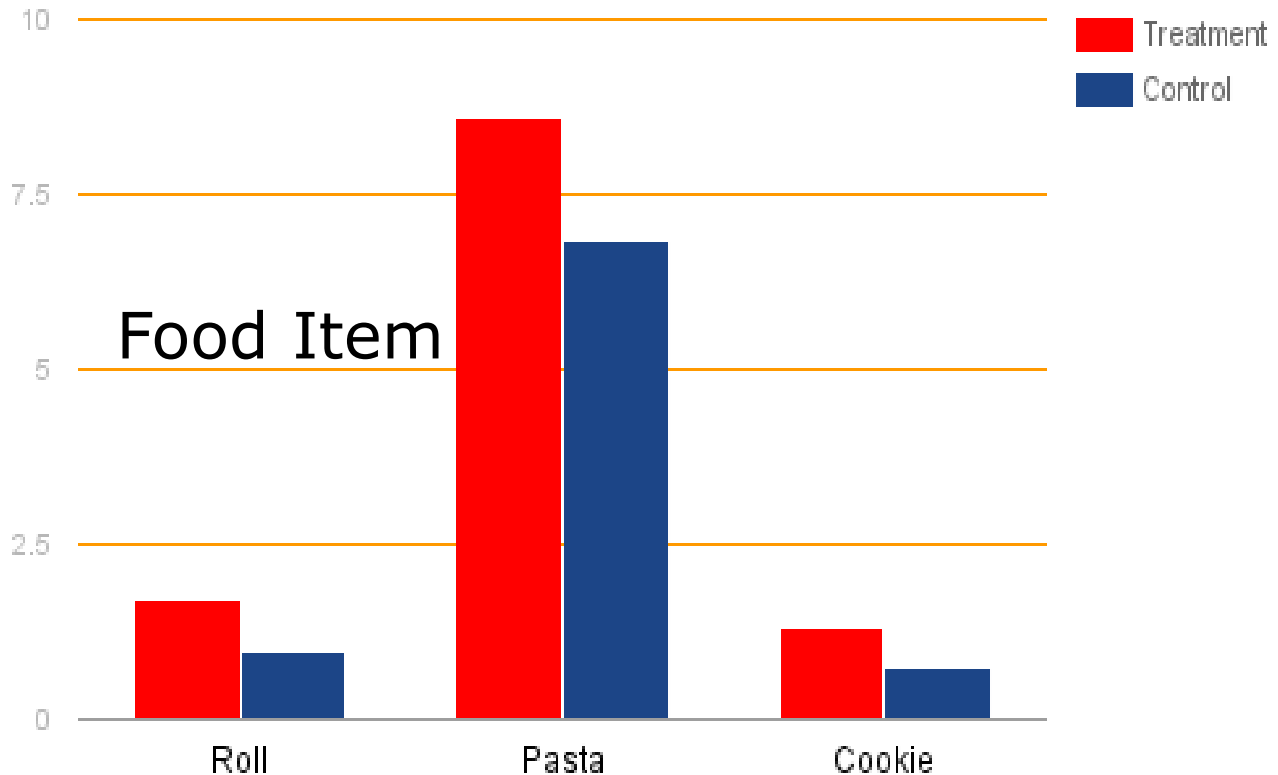
VI. The Effects of Suggestive Selling by Wait Staff on Food Consumption

Materials and Methods

- Subjects
 - Eastern Illinois University Students
 - 34 females and 12 males
- Restaurant Setting:
 - Served initial serving of 8 oz beverage, 1 roll, 6oz. Soup, 8oz. Pasta and one cookie

Average
oz/# of
Items

Comparison of Food Items Significantly Different between Groups



Zumwalt, G, K Kennedy-Hagan, C Honselman, K Rhodes, and J Painter. "The Effect of Suggestive Selling by Wait Staff on Food Consumption." *Journal of the American Dietetic Association*, 108.9 (2008): A39.

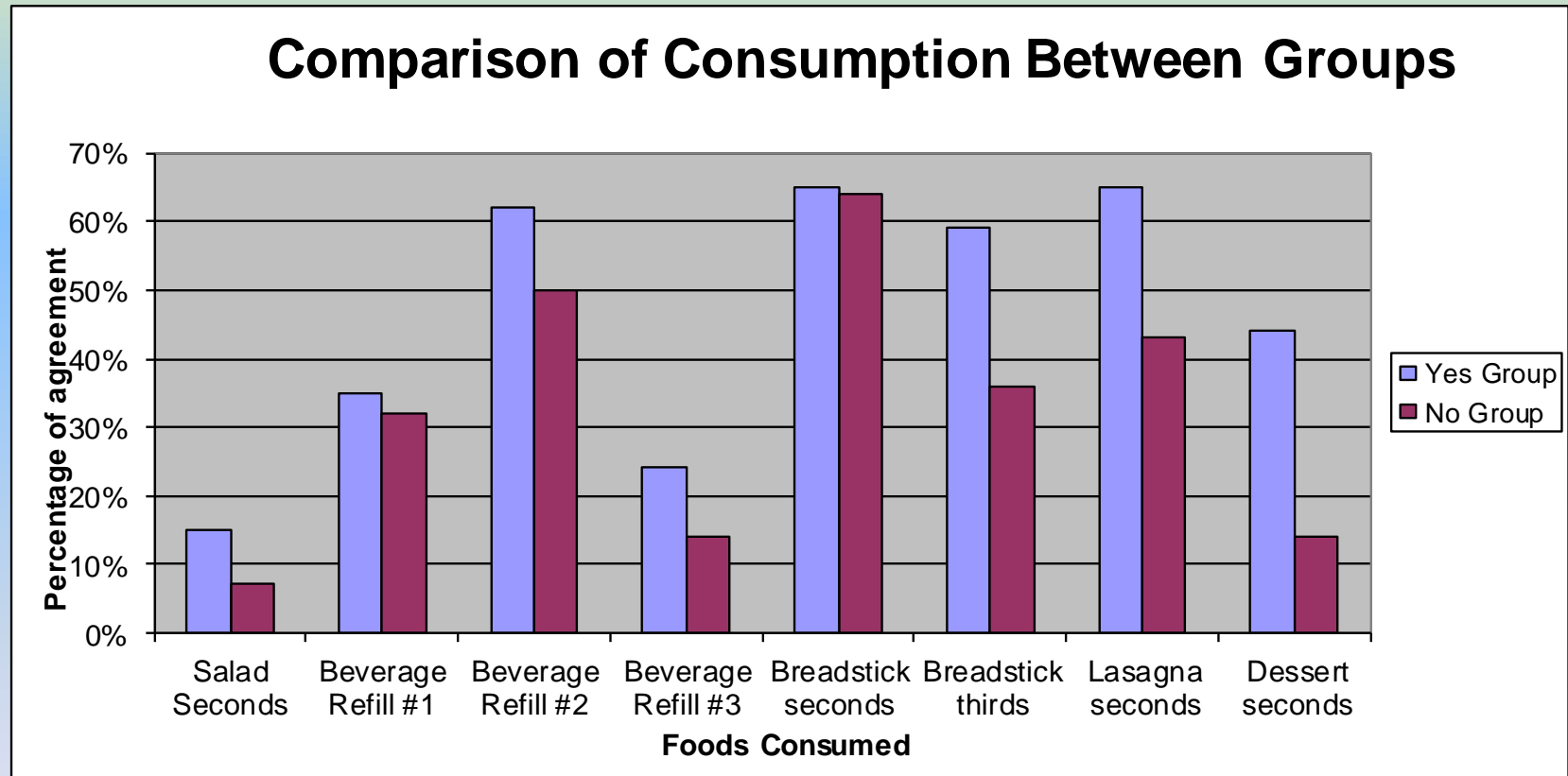
VII Social Pressure on Consumption

The Effect of Social Pressure On The Eating Habits of College Students in a Restaurant Environment

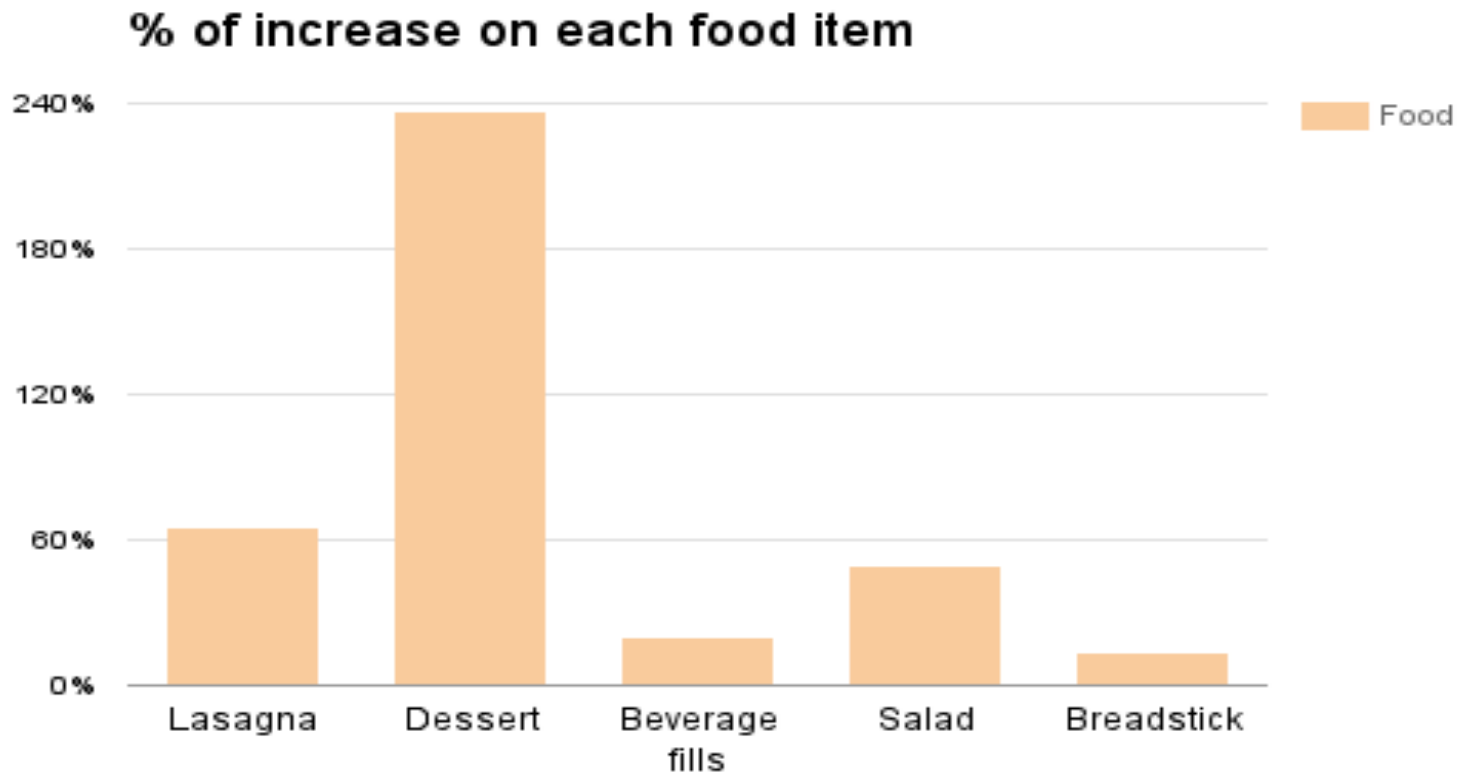
- Treatment: Research Assistant said yes to 2nd portion
- Control: Research Assistant said no to 2nd portion.

Wilcox, D. , Kennedy-Hagan, K. , Rhodes, K. , Wilkinson, R. , & Painter, J. (2008). The effect of social pressure on the eating habits of college students in a restaurant environment. *Journal of the American Dietetic Association*, 108(9), A40.

The Effect Of Social Pressure On The Eating Habits Of College Students In A Restaurant Environment



The Effect of Social Pressure On The Eating Habits of College Students in a Restaurant Environment



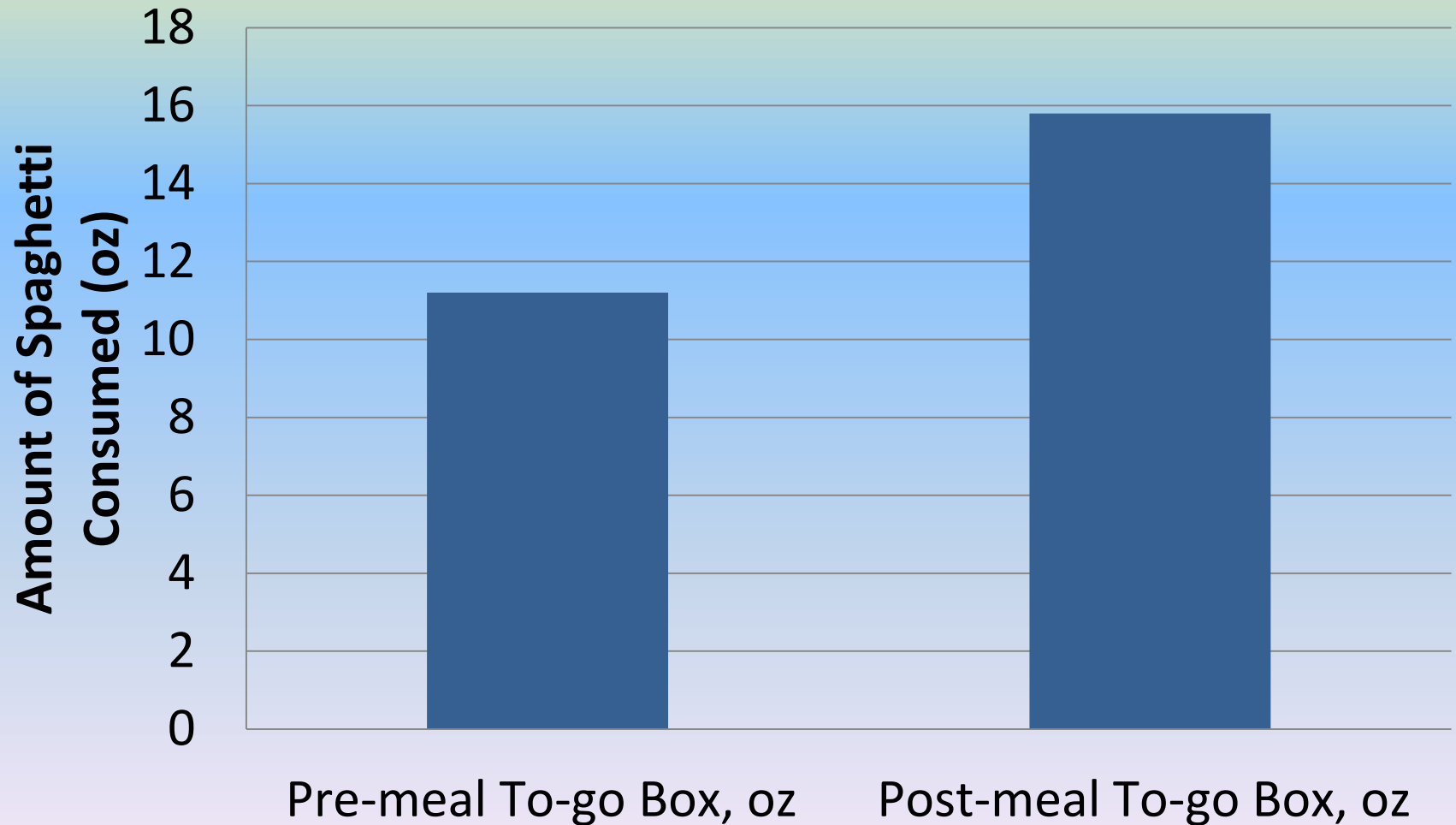
VIII Dinning Environment

Do Pre-Meal To-Go Boxes Affect the Amount of Food Consumed in a Restaurant Setting?



Schuster, M. J., Carlson, J. R., Mackenzie, J. A., Roche, J. D., Brooks, T. L., & Painter, J. E. (2014). Do Pre-Meal To-Go Boxes Affect the Amount of Food Consumed in a Restaurant Setting?. *Journal of the Academy of Nutrition and Dietetics*, 114(9), A62.

Average Spaghetti Consumption



Implications

- Portion sizes have increased: at home, eating out and in the grocery stores
- I. Smaller containers & packages decreases consumption
- II. Visual cues influence consumption
- III. Less visible & convenient = less consumption

Thank You!



Thank you to you American Dairy Association
–Indiana for making this presentation
possible!

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QUESTIONS?