



Food Portion Sizes Consumed by College Students

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Abstract

Obesity is on the rise in the United States, and causes of such an epidemic have become the basis of research in many scientific studies. Researchers are looking at portion control or distortion as one part of the problem. This portion control problem can put people who often eat in a cafeteria setting at high risk for obesity. This study examined a Midwestern University's students' eating habits and compared their eating habits to the USDA guidelines. The purpose of this study was to compare the estimated portion sizes of fruits, vegetables, and french fries consumed by college students with the USDA suggested serving size. "Serving Size Screener" was administered to a volunteer sample consisting of 67 college students (45 females) in general education classes during the 2008 spring semester. Participants were given a portion guide to use as they completed the personal food frequency questionnaire. Single sample *t*-tests were performed comparing the study sample's perceived average portion size consumed relative to the USDA suggested size for the three categories. Results indicated that students consumed significantly larger servings of each item than the USDA recommendations.

Introduction

Obesity issues have become more prevalent over the past decade, so there has been much research on the topic of portion size. The rising rate of obesity in the United States correlates with increasing portion size and has led to an increasing amount of literature on the topic (Crisler, 2003). Portion size can greatly affect the weight of any population, because any nutrient, in excess, is stored as fat. Thus, the obesity epidemic thrives (Wansink, 2007). Wansink discussed portion size as the answer to weight loss. He claimed that cutting out our favorite foods is not the answer. But, Wansink and Van Ittersum (2007) reported, "If a person generally eats 8 ounces of pasta for dinner, he or she may be quite content eating 6 to 10 ounces of pasta for dinner without feeling hungry or overly full" (p. 2). They further discussed the idea that people will not feel deprived by trimming 100-200 calories each day. If consumers would dish out 20% less pasta, for example, than they think will make them full, they probably wouldn't miss it. Wansink found that at 30% less pasta, people realized it was less but 20% was still under the radar screen. He told consumers to think 20% more when referring to fruits and vegetables. (This can replace the 20% of pasta they didn't take!) This concept of cutting down on how much we eat is, according to Wansink, *mindlessly do-able*.

Wansink & Van Ittersum (2007) demonstrated that convenience and availability significantly affected consumption amounts. Their research results proved that larger-sized receptacles promote

greater consumption than when food is available in smaller containers. One example of this would include buying food products in bulk. Bulk products are attractive to consumers because they are cheaper. However, they often cause unaware, unintended over consumption. Wansink (2007) provided further support for the statement that convenience and availability significantly affects consumption amounts through an experiment with soldiers in a mess hall. When water pitchers were placed on the dining table, instead of a side table, the soldiers drank almost twice as much, about 81% more. Similarly, college students, who eat at dormitory cafeterias for meals, are at high risk for portion distortion. One study examined college students' (N=42) ability to accurately estimate cereal serving size relative to the USDA standard; one-third of the students were within 10% of the standard serving size (Bryant & Dundes, 2005). Thus most students ate more than the standard serving size of cereal.

To date, an article was not found that looked at the portion sizes and college students' consumption of vegetables, fruit, or fried potatoes, nor other essential foods relative to the USDA guidelines. To fill this gap, this research study compared the estimated portion sizes of fruits, vegetables, and fried potatoes consumed by college students with the USDA suggested serving size. Bryant and Dundes (2005) researched whether college students could accurately assess designated serving sizes and whether the stated serving size accurately depict their actual consumption (portion size). This study assumed that students could accurately estimate their portion sizes using a portion size guideline and the Serving Size Screener and compared those answers with the USDA standard.

Thus, the purpose of this study was to compare the estimated portion sizes of fruits, vegetables, and french fries consumed by college students with the USDA suggested serving size. The question was whether or not Bradley students' perception of average serving size consumed was equivalent to, larger than, or smaller than the USDA standard. It was expected that college students would eat fewer vegetables and fruits but more fried potatoes as compared with the recommended serving sizes from the USDA guidelines.

Method

Bradley University's institutional review board, the Committee on the Use of Human Subjects in Research (CUHSR), approved this research study after the researcher completed the Human Participants Protection Education for Research Teams online course, on February 4, 2008.

Sample

A non-random convenience sample was recruited from three undergraduate classes: an introductory psychology course and two upper-level English courses. The total sample comprised 67 students:

- 45 were female (67%)
- Average age = 19 years old
- 25 were from Education and Health Sciences (37.3%)
- 17 were from Liberal Arts and Sciences (25.4%)
- 15 were from Business (22.4%)

- 10 (14.9%) were from College of Fine Arts ($n=6$), AEP ($n=3$), and Engineering and Technology ($n=1$)

Procedures

Bradley University professors were contacted and a time was arranged for administration of the Serving Size Screener questionnaire. Surveys were optional to students in the classroom. No incentives were offered by the researcher. The Serving Size Screener questionnaire was administered to each willing individual in the classroom. Attached to the survey was a portion size guideline to aid them in portion size estimation. The researcher explained the study, how to fill out the Serving Size Screener, as well as how to use the portion size guideline sheet. Demographic information was also collected. Confidentiality was maintained.

Measures

Serving Size Screener, found in Nutritional Assessment by Nieman (2007), was used in this study. Participants were asked if they ate fruit, fried potatoes, and vegetables. If they commonly consumed these foods, they moved onto the next question that asked how much they ate of these foods, each time they ate these foods. Student responses were measured on a scale of one to four, reflecting the amount consumed. The higher the number, the larger amount consumed. USDA suggested serving sizes were included in the answer selections but were not highlighted.

Data Analysis

Single sample t -tests were performed using SPSS 15.0 comparing the study sample's perceived average portion size consumed to the USDA suggested size for the three categories.

Results

Results from the Serving Size Screener indicated that students consume significantly larger servings of each item than the USDA recommendations (see Table 1). Screening questions resulted in varying sample sizes. For example, of the 67 students surveyed, 51 responded that they ate fries during the past month, so 16 claimed to have not consumed fries in the past month. For vegetables, only one participant claimed to have not consumed any for the past month, so our sample size was 66 participants. For vegetables, our sample average serving size was 1.2 cups compared to the suggested 1 cup; $t(65) = 2.49$, $p = .015$, $d = .31$; for fruits, our sample average serving size was a little larger than one medium fruit (1.10) compared to the suggested 1 medium fruit; $t(64) = 2.37$, $p = .02$, $d = .29$; and for fries, our sample average serving size was almost three times the suggested serving size (almost 1.5 cups for our sample); $t(50) = 11.17$, $p < .001$, $d = 1.02$. The effect size (Cohen's d) was small for vegetables and fruits, because two tenths of a cup difference is generally not detectable to participants. However, the effect size for fries was quite large, because the difference between a $\frac{1}{2}$ cup and almost $1\frac{1}{2}$ cups can be perceived without difficulty. Also, supplemental analyses found no significant difference between males and females on the amount of fries eaten in the past month.

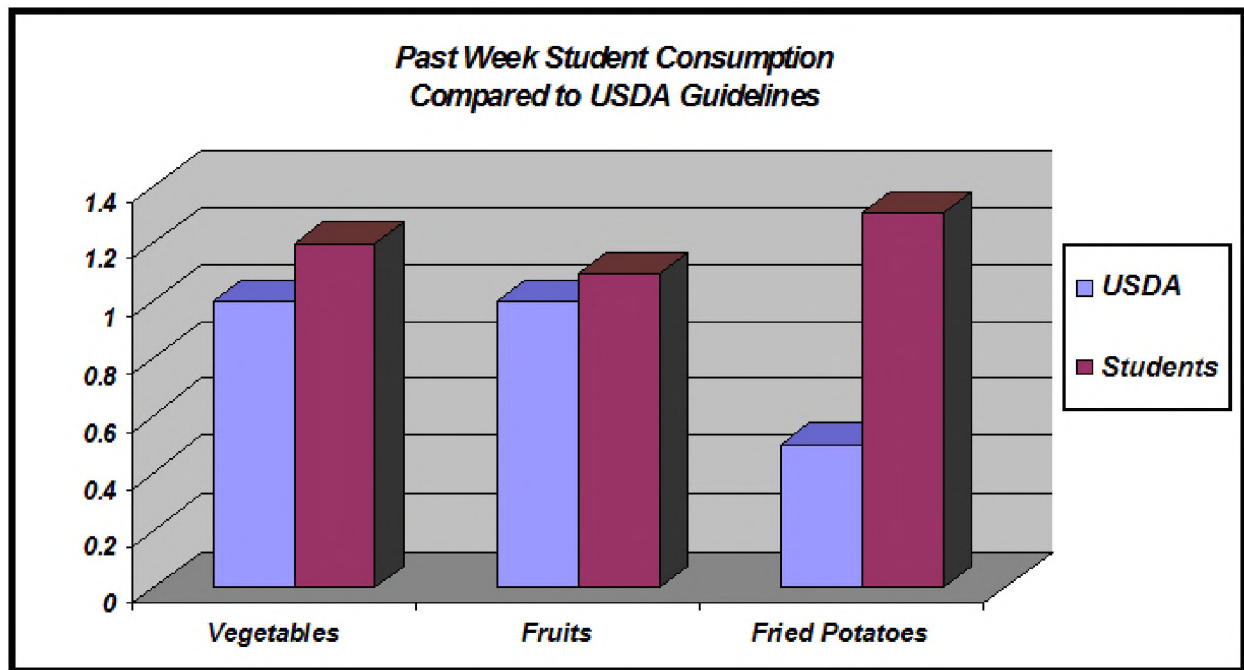
Table 1

Single Sample T Test: Past Week Amount Eaten of Vegetables, Fruits, and Fried Potatoes Compared to USDA Suggested Serving Size

| Serving Content | n | USDA Suggested Size | M (SD) | t | Effect Size (Cohen's d) |
|-----------------|----|---------------------|------------|---------|--------------------------|
| Vegetables | 66 | 1 C | 1.2 (.59) | 2.49* | 0.31 |
| Fruits | 65 | 1 med fruit | 1.10 (.57) | 2.37* | 0.29 |
| Fried Potatoes | 51 | .5 C | 1.31 (.80) | 11.17** | 1.02 |

Note. * $p < .05$. ** $p < .001$.

Figure 1. Past week student consumption compared to USDA guidelines.



Discussion

The results confirmed my hypothesis about Bradley students consuming a larger portion of fries than the suggested serving size recommended by the USDA. But, my findings did not support my hypotheses about fewer fruits and vegetables being eaten compared with the suggested serving size

recommended by the USDA. Instead, students were consuming close to but a slightly larger amount than recommended by the USDA.

There are no comparative data for this study that measured portion size consumption of fruit, fried potatoes, and vegetables among college students. The Serving Size Screener questionnaire was administered to 67 students on Bradley University's campus. The participants answered questions about the amounts of fruits, fried potatoes, and vegetables they consumed, each time they consumed them. They answered these questions with the help of a portion size guideline, which compared common serving sizes to household items. For example, $\frac{1}{2}$ cup of cooked rice or pasta is equivalent to the size of half a baseball or a $\frac{1}{4}$ cup of raisin is equivalent to the size of a large egg. The average consumption of fruits and vegetables among the nonrandom convenience sample proved to have relatively small effects. Thus, even though the results were significant, they were not much different than USDA's standard serving size.

Most intriguing is the finding for french fries. First, almost one-fourth of my sample (16/67) reported that they had not eaten fries or fried potatoes in the past month. This finding could mean that those students have been or were currently enrolled in a nutrition class, or perhaps these participants were health conscious, rarely eating fast food. However, those who did report eating fries (about three-fourths of the sample) during the past month ate almost three times the USDA recommended serving size.

I expected more overeating on the fried potatoes/french fries than the fruits and vegetables, because, for example, the option to super size a meal at a fast food restaurant is often a tempting option. They offer consumers much more with little additional cost. The low-cost choice makes people think they are getting a deal, more for their money. According to Wansink (2007), "Value sizes led to value meals, and value meals at one restaurant led to larger value meals at the restaurant across the street" (p. 3). Later, casual dining restaurants attempted to create perceptions of value. They tried to offer more and more food for less and less money, in order to differentiate themselves. People assume they are getting a better deal when they get more for their money. But, with a larger sized portion of food, a high caloric intake occurs.

Even consumers who are interested in caloric intake and portion size can underestimate how much they consume when they are eating in busy environments. Distraction often causes people to eat larger portions than normal (Wansink & Van Ittersum, 2007). In this example, portion size is directly correlated to the obesity epidemic. As portion size increases with fast food value meals, the ability to keep track of calories becomes increasingly difficult.

Bryant and Dundes (2005) found that students overeat on cereal. This is yet another example of the correlation between portion distortion and the rising rates of obesity, because boxes of cereal have become larger to increase sales. Consumers think they are getting more for their money. However, they end up eating more. Wansink found, when eating out of a larger bag or box, the increase in amount is not noticed and individuals take in loads of calories. This same evidence could be found in cafeteria settings. With more available, more is dished onto the plate, and then more food is generally consumed.

The results found from the fruits and vegetables questions are encouraging, as there are small effect sizes. Thus, Bradley students are, on average, on track with the USDA suggested serving sizes for fruits and vegetables. But, the large effect sizes of the fried potatoes question are not so encouraging.

Another reason for over consumption of fried potatoes/french fries could be that unlimited access is offered in dormitory cafeterias. Unlike getting a bag of chips out of a vending machine, in a cafeteria setting, once the food on your plate is gone, there is a second and third helping waiting. A student in a cafeteria setting is at high risk for increased caloric intake, simply because of the quantity of food available (Bryant & Dundes, 2005). The offering of an unrestricted supply of food is definitely a reason for over consumption.

There are a few limitations associated with this study. First, the sample was a nonrandom convenience sample. Participants were not randomly selected from the target population. Another limitation included the participants' ability to estimate portion sizes with the supplied portion size guidelines.

References

- Bryant, R., & Dundes, L. (2005). Portion distortion: A study of college students. *The Journal of Consumer Affairs*, 39, 399-408.
- Crister, G. (2003). *Fat land: How Americans became the fattest people in the world*. New York: Houghton-Mifflin Company.
- Nieman, D., & Lee, R. (2007). *Nutritional assessment* (4 th ed.). New York: McGraw-Hill.
- Wansink, B., & Van Ittersum, K. (2007). Portion size me: Downsizing our consumption norms. *Journal of the American Dietetic Association*, 107, 1103-1106.
- Wansink, B. (2007). *Why we eat more than we think: Mindless eating*. New York: Bantam Dell.

