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Research report

Categorization of foods as "snack" and "meal" by college students

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ABSTRACT

The cognitive representation of a food as being a "snack" or a "meal" influences eating behavior. We found previously that subjects who considered a particular food to be a 'snack' ate significantly more calories when tested later than subjects who considered the same foods as a 'meal'. We conducted two surveys to determine the categorization of foods as "snacks" or "meals". Survey 2 included a larger variety of foods with detailed descriptions and a response option of "never tried". Both surveys found that potato chips, crackers, cookies, and nuts were consistently viewed as snacks, while soups, burritos, pizza, and pancakes were consistently viewed as meals. Useful for future research are foods we found that students varied in considering a snack or meal. Survey 1 found that half the respondents viewed toast, cheese on toast, muffins, and French fries as snacks and the other half as meals. Similarly, in Survey 2 potato salad, toast with jam, English muffin, cinnamon rolls, and nachos were categorized almost equally as snack and meal. These foods can be used in studies looking at the effects of categorizing a food as a meal or snack on other behaviors or categorization, while controlling for the food item.

Introduction

There are a variety of ways that people classify foods. One way is through cognitive schemas or constructs used "to talk about people's knowledge about the stimuli in their environments" (Pliner, 2008). Schemas can be activated when talking or even thinking about food. Schema theory can be used to understand how people classify foods. Blake, Bisogni, Sobal, Devine, and Jastran (2007) used a card sorting task to find out the various schemas that people use to classify foods. They found that people were more likely to classify foods based on the type of meal or time of the meal (example: breakfast food, snack food, meal foods, holiday foods, summer foods, etc.) than on nutrient content of foods. This is important because it tells us that people use these schemas more commonly than other criteria for organizing their thoughts about food.

Food classifications may also be based on certain features of a food itself. Furst, Connors, Sobal, Bisogni, and Falk (2000) found that some common food classification themes were based on taste (like/dislike), healthiness (not healthy/healthy), and price (cheap/expensive) of foods. On the other hand, contexts such as living situations and age were also used to classify food. For instance, food classifications of an elderly woman living alone included "things I can chew/can't", "eat at home/eat out" and "agrees with me/doesn't agree with me", whereas, food categories like "husband likes/does not like" and "can afford/can't afford" were provided by a married woman living with children (Furst et al., 2000).

People also use several categories to classify food. Ross and Murphy (1999) found that when people were asked to generate categories for 45 foods, two to five categories per food were most commonly generated and those included both script-based and taxonomic categories. Taxonomic categories of food are based on a higher categorization level such as breads, dairy products, beverages, and meats. On the other hand, script-based categories of foods are based on the time or situation in which foods are eaten. "Snack foods", "breakfast foods", "healthy foods", and "junk foods" were some of the script-based categories of foods that were commonly generated. Script-based categories of foods are important because they were generated almost equally to taxonomic categories in food classifications and were based on interactions with food rather than on the physical properties of foods (Ross & Murphy, 1999).

Food classifications may also vary by age and gender. Chapman and Maclean (1993) found that young, adolescent women categorized foods into healthy or "junk" foods. Moreover, healthy foods (fruits and vegetables) were consistently placed in the four food groups while unhealthy foods (chocolates and potato chips) were placed in a fifth "junk food" group. When 8–13 year old children were instructed to group similar foods and name those groups, they used both taxonomic categories as well as script-based categories of foods. Some of the script-based categories of foods used were "breakfast foods" or "lunch foods" or were even based on certain special events like "birthday foods" (Beltran et al., 2008).

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Further, King, Herman, and Polivy (1987) found that dieters were more likely to use "meal" labels (breakfast, lunch and dinner), place food into categories of "allowed" foods, and report guilt associated with foods. Interestingly, dieters expressed guilt for both sweet (chocolate, doughnuts, cakes, muffins) and salty snacks (popcorn, pretzels, potato chips) as compared to non-dieters who reported guilt only for sweet snacks.

Categorizations of food may also vary based on our expectations of an eating event. Pliner and Martins (2002) found that subjects who watched a videotape of a person eating with meal-associated cues (such as eating with utensils, etc.) were more likely to rate the situation as a meal than another videotape that showed a person eating with none of these cues. Similarly, Pliner and Zec (2007) found that when subjects were seated at a table, provided eating utensils, and served a full course of meals in an appetizer-main course-dessert sequence they were more likely to describe their eating situation with meal-related words (like lunch, etc.) than subjects who stood at the kitchen counter to eat and were not allowed to socialize with others. Subjects in the meal condition were also more likely to eat fewer calories when tested after the preload than subjects in the non-meal condition. Wansink, Payne, and Shimizu (2010) conducted interviews to explore the environmental factors that may be important in categorizing a particular food as a "snack" or a "meal". Meals were associated with eating with family, sitting, presence of ceramic versus paper plates, cloth napkins, and large portion sizes, whereas snacks were associated with eating alone, standing, and smaller portions.

Importantly, how we categorize a food also affects our eating behavior. Capaldi, Owens, and Privitera (2006) showed that the same food could be classified as a snack or a meal by different people and how an individual categorized a food affected subsequent eating behavior. Prefeeding identical foods Capaldi et al. (2006) showed that people who categorized the food as a snack ate more after the prefeeding than people who categorized the same food as a meal. This was true with both high protein and high carbohydrate foods. Since the testing situation was identical, the categorization of foods as "snacks" or "meals" was not based on the current environment but may have been based on subjects' previous experiences with food. Thus the more people categorize what they eat as snacks, the less satiated they will be and the more they will eat. A number of studies have found that snacking can lead to weight gain. Berteus-Forslund and colleagues (2005) looked at the frequency of snacking and its relation to energy intake in obese and normal weight adults. They found that intake of high-sweet, high-fat snacks were associated with an increase in energy intake and that obese adults snacked more often than normal weight adults. In addition, Levitsky, Halbmaier, and Mrdjenovic (2004) found that the highest variance in weight gain among college freshmen was explained by the intake of evening snacks and high-fat foods. In addition, Maffeis and colleagues (2008) investigated the types and amounts of snacks consumed by a large sample of 8 to 10-year-old children. The results showed that energy density and taste (savory) of snacks were independent predictors of obesity (Maffeis et al., 2008).

Here, we surveyed undergraduates to see which foods were considered mostly as snacks, mostly as meals, and particularly useful, foods which were considered as snacks by some and meals by others. This latter group of foods is a useful list for studies wishing to control for food characteristics to investigate the effects of categorizations of foods as a snack or meal. For instance, Shimizu, Payne and Wansink (2010) used a list of foods that could be differentially categorized as snacks and meals. They then used these foods in a study looking at the effects of manipulating environmental cues associated with snack or meal events on subsequent food intake.

Two surveys were conducted. In the first survey, subjects categorized foods as "snacks" or "meals". Some of the foods were novel to subjects, so therefore we conducted a second survey which included a larger number of foods with detailed descriptions that allowed respondents to additionally select "never tried" as a response to the foods.

Survey 1

Method

Subjects

One hundred and ninety-five undergraduate students (108 males and 87 females) enrolled in an Introductory Psychology class at Arizona State University participated in the study. Subjects had a mean age of 18.9 years with a mean weight of 151 lb (males = 166.6 lb, females = 131.6 lb) and a mean height of 67.6 in. (males = 69.9 in., females = 64.8 in.). The mean body mass index (BMI) score was calculated for each subject using self-reported weight and height measurements. Thus, the mean BMI score was 22.9 (males = 23.5, females = 22.1). Based on BMI range values, 12 were underweight (3 males, 9 females), 141 were normal-weight (75 males, 66 females), 28 were overweight (21 males, 7 females) and 14 were obese (9 males, 5 females). All subjects gave their informed consent prior to their inclusion in the study. All human studies were approved by the Human Subjects IRB and experiment procedures were performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

Procedures

Survey respondents categorized eighty-five foods as "snacks" or "meals". These foods were selected because they are commonly liked and consumed by college students (Brunt & Rhee, 2008; Freedman & Connors, 2011) and frequently purchased from vending machines (Park, Sappenfield, Huang, Sherry, & Bensyl, 2010). Also, most of these foods have increased in portion size in the past few decades and increased portion sizes are an independent contributor to obesity (Young & Nestle, 2003). For purposes of data analysis, we placed the foods into the following groups: "Breads, cereals, rice & pasta" group (35 foods), "Meats, poultry, fish, beans, eggs & nuts" group (19 foods), "Milk, cheese & yogurt" group (10 foods), "Fruits & vegetables" group (6 foods) and "Fats, oils & sweets" group (14 foods). Mixed dishes like macaroni and cheese, pizza, etc. were grouped based on the primary ingredient of those foods. Therefore, these foods were placed in the "Breads, cereals, rice & pasta" group. Fruit and yogurt parfait, on the other hand, was placed in the "Milk, cheese & yogurt" group.

Data analyses

Frequencies of foods were analyzed for each group. Percentage of foods that were considered to be snacks and meals by more than 50% of the sample was referred to as belonging to the "snack" and "meal" category respectively.

Results

There were clear differences among foods, with some clearly categorized as meals, some clearly categorized as snacks, and some categorized equally in both categories. Foods categorized as snacks and meals are listed in Table 1 for survey 1.

Foods categorized as both snacks and meals were cheese on toast (52% snack, 43% meal), toast (47% snack, 53% meal), muffins (54% snack, 46% meal) and French fries (52% snack, 48% meal).

Foods consistently viewed as snacks were: cereals, crackers, Pringles, Cheez-its, potato chips, roasted nuts, flavored milk, fla-