



Short communication

Foods that are perceived as healthy or unhealthy differentially alter young women's state body image

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ARTICLE INFO

Article history:

Received 19 November 2010

Received in revised form 5 May 2011

Accepted 26 May 2011

Available online 12 June 2011

Keywords:

Body image state

Body image states scale

Profile of mood states

Dietary restraint

Food perception

Women

Body satisfaction

ABSTRACT

Body image can be influenced by day-to-day events, including food intake. The present study investigated the effects of foods typically perceived as “healthy” or “unhealthy” on state body image and mood. College-aged women were told the experiment was designed to assess the effects of food on cognition. Using a between-subjects design, participants consumed isocaloric amounts of foods perceived to be healthy (banana) or unhealthy (donut) or ate nothing. Next, participants completed three cognitive tasks. Prior to eating and following the cognitive tests, participants completed the BISS, POMS, the Figure Rating Scale, and the Restraint Scale. Body satisfaction decreased following intake of a donut, but was not altered in the other conditions. Depression scores significantly decreased after intake of either a donut or banana, but did not decrease in the no-food condition. Tension scores decreased significantly after consumption of a banana and in the no-food condition, but did not decrease following consumption of a donut. These results indicate that intake of a food that is perceived as unhealthy negatively affects state body image.

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Body image is characterized by two distinct components: attitudinal and perceptual. The perceptual component involves personal perception of one's own body and shape whereas the attitudinal component includes the feeling or attitude that one has towards his/her own body (Vocks, Legenbauer, & Heil, 2007). For example, if individuals have low body image satisfaction, they may perceive their body size as larger than it actually is (perceptual) and may have generally negative feelings about their body (attitudinal). Historically, body image has been considered a trait characteristic, constant and unchanging, but recent research indicates that body image is a more malleable concept, specifically with regards to the attitudinal component. Recent studies demonstrate that body image is easily influenced by a number of factors, including media portrayals of women, level of hunger, and BMI (Fallon & Hausenblas, 2005; Fett, Lattimore, Roefs, Geschwind, & Jansen, 2009; Lattimore (2005); Melnyk, Cash, & Janda, 2004; Pietrowsky, Straub, & Hachl, 2003; Rudiger, Cash, Roehrig, & Thompson, 2007).

Food intake may be a particularly salient environmental stimulus for impacting body image. Using the Body Image States Scale (BISS) Vocks et al. (2007) found that intake of a high-calorie milkshake adversely affected body image satisfaction. The negative effect of food intake on body image was greater in participants who were classified as restrained eaters than in those classified as unrestrained eaters. One explanation for the preceding finding is that an

individual's expectations about the ultimate consequences of food intake (e.g. gaining weight) increase body dissatisfaction.

Results of more recent studies speak to the power of food, even if it is not consumed, in mediating state body image, especially in restrained eaters who are concerned about their weight and shape. Restrained eaters who were shown high-calorie foods, such as potato chips, chocolate and cake, and told to pay attention to, but not to eat the foods were less satisfied with their weight than unrestrained eaters who were told to concentrate on the high-calorie foods (Fett et al., 2009; Geschwind, Roefs, Lattimore, Fett, & Jansen, 2008).

Beliefs about the health value of food are common in our society. Based on their perceived caloric and nutrient content (e.g. fat content), some foods are generally considered to be “unhealthy” (e.g. pastry; ice cream), whereas others are considered to be “healthy” (e.g. fruits and vegetables). These categorizations do not always correspond to the caloric value of the food. For example, a low-calorie serving size of a food that is perceived to be unhealthy is believed to lead to greater weight gain than a serving size of a high-calorie food with a more healthy image (Oakes, 2006; Oakes & Slotterback, 2005; Oakes, Sullivan, & Slotterback, 2007). Additionally, beliefs about the healthfulness of foods can alter mood subsequent to food intake. In general, consumption of foods perceived as unhealthy are more likely to produce negative mood states than foods perceived as healthy (Macht & Dettmer, 2006; Ogden & Wardle, 1991).

The present experiment was designed to assess the effects of foods perceived to be “healthy” and “unhealthy” on state body image and mood. To hide the true aim of the study, scales measuring body image and mood were hidden among questionnaires assessing

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other general health practices (i.e. sleep questionnaires, smoking questionnaires, exercise questionnaires) and participants were told that they were taking part in a study analyzing the relationship between intake of certain foods and cognitive behavior.

Method

Participants

Fifty female college students between the ages of 18–25 years ($M = 19.46 \pm 1.43$) were enrolled in the study. Participants were recruited using an online advertisement. To determine health eligibility, each participant completed a health-screening questionnaire. Exclusion criteria included any history of depression, eating disorders, or other psychopathological conditions, heart disease, diabetes, gastric bypass surgery, or any medication with the exception of birth-control pills.

Foods

In a pilot experiment, a different group of students were asked to rate a list of foods according to whether they believed the foods to be “healthy” or “unhealthy.” On the basis of this survey, a donut (perceived as unhealthy) and banana (perceived as healthy) were chosen as the foods to be used in this study. Participants were randomized into one of three diet conditions. They consumed either nothing, a 57-g doughnut (210 Kcal) (Country Kitchen[®] of Lepage Bakeries, Inc. Auburn, ME) or 225 g of banana (200 Kcal). Bananas were cut into bite-size pieces and presented in a bowl with a fork.

Questionnaire measures

Body Image States Scale (BISS)

The BISS contains six items that assess different aspects of body image such as physical appearance, body size and shape, body weight, and attractiveness, as well as concerns about how one looks relative to others. Participants were instructed to complete the questionnaire describing “How are you feeling right now?” A higher score represents higher body image satisfaction. The BISS is an internally consistent scale, and construct validity has been confirmed (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002).

Hunger and Tiredness Scale

Hunger and tiredness were assessed using a two-item Likert Scale asking present hunger level and level of tiredness. Responses fell on a 0–4 scale from not at all to extremely hungry or tired.

Profile of Mood Scale (POMS)

The POMS is an inventory of subjective mood states that includes a series of 65 mood-related adjectives (McNair, Lorr, & Droppleman, 1994). Participants rated these adjectives on a five-point scale, using the response set of “How are you feeling right now?” The adjectives factor into six mood subscales: tension, depression, anger, vigor, fatigue, and confusion.

Figure Rating Scale

The Figure Rating Scale consists of nine schematic silhouettes ranging from very thin to very obese, and is used to measure body size perception (Stunkard, Sorensen, & Schulsinger, 1983). In the present study, participants were asked to rate silhouettes according to how they perceived their own bodies. A higher score represents a larger body size perception.

Restraint Scale

The Restraint Scale is a 10-item questionnaire exploring an individual's level of dietary restraint (Herman & Polivy, 1980). A high score on the scale indicates a higher level of dietary restraint.

Three Factor Eating Questionnaire

The Three Factor Eating Questionnaire is a 51-item questionnaire which has been used to measure (1) cognitive restraint of eating, (2) disinhibition of eating, and (3) hunger (Stunkard & Messick, 1985).

Eating Disorder Inventory-2

The Eating Disorder Inventory-2 (EDI-2) is a 91-item scale designed to assess the psychological features commonly associated with anorexia nervosa and bulimia nervosa. It has 11 subscales to measure levels of drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, maturity fears, asceticism, impulse regulation, and social insecurity (Garner, 1991).

In addition to the scales described above, self-report height and weight were obtained and BMI was calculated ($\text{kg}/\text{height in m}^2$). Furthermore, a number of standard questionnaires were given to mask the intent of the experiment, and were not included in analyses.

Cognitive tests

Cognitive tests were given as means of masking the true purpose of the experiment, and to provide a controlled 30-min delay between food intake and the second administration of the questionnaires. All cognitive tests had been used previously in our laboratory (D'Anci, Watts, Kanarek, & Taylor, 2009). These tests included a vigilance-attention task, a spatial memory task, and a short-term memory task. The data for these tasks were analyzed, and no significant differences were observed as a function of experimental condition.

Procedure

All experimental procedures took place between 1200 and 1730 h. Participants were asked to not eat for 2 h before the experiment. Upon arrival, participants completed the BISS, POMS, Hunger and Tiredness Scale, Figure Rating Scale, Restraint Scale, and the 3-Factor Eating questionnaire, as well as questionnaires designed to mask the exact nature of the experiment. Participants then consumed either a donut ($n = 18$) or banana ($n = 17$), or nothing ($n = 15$). Participants were required to consume the entire donut or banana. Next, cognitive tests were administered. After the cognitive tests were completed, the participants were again given the BISS, POMS, Hunger and Tiredness Scale and Figure Rating Scale, as well as the EDI-2, and other questionnaires designed to mask the nature of the experiment.

This study was approved by the Tufts University Institutional Review Board.

Statistics

Data were analyzed using one-way ANOVAs with diet (nothing; banana; donut) as a between-subjects variable, and two-way ANOVAs with diet as a between-subjects measure and test time (before and after food intake) as a within-subjects measure (SPSS Inc., Chicago, IL). Data are presented as means \pm SEM. Alpha was set at $p < .05$ throughout.

Results

Participant characteristics

There were no differences in age, BMI, restraint status, and scores on the subscales of the Eating Disorder Inventory across dietary conditions.

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