



Elasticity in portion selection is predicted by severity of anorexia and food type in adolescents



M. Herzog^{a, b}, C.R. Douglas^{a, c}, H.R. Kissileff^{a, *}, J.M. Brunstrom^d, K.A. Halmi^e

^a New York Nutrition Obesity Research Center, Department of Medicine, Columbia University Medical Center, New York, NY, USA

^b Teachers College, Columbia University, New York, NY, USA

^c Institute of Human Nutrition, Columbia University College of Physicians and Surgeons, New York, NY, USA

^d University of Bristol, Bristol, UK

^e Weill Cornell Medical College, White Plains, NY, USA

ARTICLE INFO

Article history:

Received 11 December 2015

Received in revised form

9 March 2016

Accepted 24 March 2016

Available online 30 March 2016

Keywords:

Eating disorders

Portion size selection

Food intake controls

Perception

Food choice

ABSTRACT

The size of portions that people select is an indicator of underlying mechanisms controlling food intake. Fears of eating excessive portions drive down the sizes of portions patients with anorexia nervosa (AN) can tolerate eating significantly below those of healthy controls (HC) (Kissileff et al., 2016). To determine whether patients with AN will also reduce the sizes of typical or ideal portions below those of controls, ANOVA was used to compare maximum tolerable, typical, and ideal portions of four foods (potatoes, rice, pizza, and M&M's) in the same group of 24 adolescent AN patients and 10 healthy adolescent controls (HC), on which only the maximal portion data were previously reported. Typical and ideal portion sizes did not differ on any food for AN, but for HC, typical portions sizes (kcal) became larger than ideal as the energy density of the food increased, and were significant for the most energy dense food. Ideal portions of low energy dense foods were the same for AN as for in HC. There was a significant 3-way (group × food × portion type) interaction, such that HC selected larger maximum than typical portions only for pizza. We therefore proposed that individuals of certain groups, depending on the food, can be flexible in the amounts of food chosen to be eaten. We call this difference between maximum-tolerable, and typical portion sizes selected “elasticity.” Elasticity was significantly smaller for AN patients compared to HC for pizza and was significantly inversely correlated with severity of illness. This index could be useful for clinical assessment of AN patients, and those with eating problems such as in obesity and bulimia nervosa and tracking their response to treatment.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Individuals with anorexia nervosa (AN) are preoccupied with calorie counting and food portion sizes, and they have extensive knowledge about the energy content and macronutrient composition of foods (Halmi, 2007). In one study, participants were asked to evaluate 38 different foods (Sunday, Einhorn, & Halmi, 1992). Both anorexic and bulimic patients were more accurate than control participants in their assessment of the caloric and macronutrient content of the foods, and AN patients displayed an aversion to high-fat and highly energy-dense foods (Sunday et al., 1992). These findings confirmed that patients with eating disorders show an

aversion to fat and a preference for low-calorie foods (Drewnowski, Yee, & Krahn, 1988). Drewnowski et al. also found that AN patients tend to prefer a sweet taste over a fatty taste, while controls preferred a taste that had a more balanced ratio of sweet to fat (Drewnowski, Halmi, Pierce, Gibbs, & Smith, 1987), a finding that was subsequently confirmed by Sunday and Halmi (Sunday & Halmi, 1990). AN patients also have a strong aversion to carbohydrates or “carbohydrate phobia” (Crisp & Kalucy, 1974), due to perceptions about the weight-promoting properties of carbohydrate-rich foods. Furthermore, Halmi and Sunday found that anorexic patients report lower hunger and higher fullness, before, during, and after an experimental liquid meal, compared to control participants (Halmi & Sunday, 1991).

AN patients also tended to overestimate food portion sizes compared to controls (Milos et al., 2013), and to rate energy-dense foods to be 12% larger than controls (Yellowlees, Roe, Walker, &

* Corresponding author. 1150 St. Nicholas Ave., New York, NY, 10032, USA.

E-mail address: hrk2@cumc.columbia.edu (H.R. Kissileff).

Ben-Tovim, 1988). AN patients report less hunger and eat less than controls in general (Halmi & Sunday, 1991). Consequently, differences in the sizes of portions among foods between AN and HC might be an indicator for the onset of disordered eating in AN. The use of a non-threatening test that can measure the differences in portion selection between anorexic and healthy individuals and the correlates of these differences can thus provide an objective marker of eating disorder risk. In a preliminary study by Kissileff, et al., (2016), a novel computerized method of measuring responses to pictures of portion sizes (Brunstrom & Rogers, 2009; Brunstrom, Shakeshaft, & Scott-Samuel, 2008) was used to measure the maximum tolerated portion of food participants could consume and their anxiety response to increasing portions. In the present paper we now include data on typical and ideal portion sizes as well as ratings of liking, healthiness, and familiarity (measured by frequency of consumption) in order to determine whether maximum portion sizes were under a different control (and hence would generate a different profile of responses to different foods) than what the participants would typically eat or what they thought they “should” eat (ideal portion size). Given the large differences in maximum portions of high but not low energy dense foods chosen by patients compared to controls, it was expected that anorexic patients would also select both a smaller typical and ideal portions of energy-dense foods than controls, due to fear of weight gain or because AN patients perceive portion sizes to be bigger than they actually are.

A new variable, which we call ‘**elasticity**’, was derived by subtracting typical from maximal portion size and is, therefore, an index of flexibility in portion size selection across foods and groups. A wider disparity between the two types indicates an ability to eat flexibly, while a narrow disparity indicates rigidity. Hence, the elasticity variable demonstrates a participant’s flexibility in portion selection. Our expectation, based on the concept of cognitive rigidity and behavioral restraint rigidity in AN patients (Westenhofer, 1991), and as described by Steinglass, Walsh, and Stern (2006), was that anorexic patients would exhibit less elasticity than healthy controls (reflecting their rigid eating habits).

In addition, participants’ ratings of the perceived healthiness of a food, how much they liked and how frequently they ate a food, were solicited, in order to analyze how these factors impact the portion sizes selected. We hypothesized that patients’ concept of the food’s healthiness would be significantly and positively related to their ideal and typical portion sizes and elasticity, and their frequency of eating that food. Findings regarding typical and ideal portions sizes and elasticity in anorexic patients may aid in elucidating factors that characterize the disorder, and be applied in a clinical setting to diagnose patients and evaluate progress in targeted therapies.

2. Materials and methods

2.1. Study sample

Data for this study were collected between October 2, 2008 and June 16, 2010. Twenty-three female participants and one male participant with AN were recruited from the Outpatient Services of the Weill Cornell Westchester Division and through an NIH Family Therapy Study. Participants were not undergoing treatment at the time of the study. Individuals were eligible to participate in this study if they were between 12 and 18 years old and met DSM-IV diagnostic criteria for AN (the version of DSM used during that time period), except for amenorrhea, which was not included as a requirement for inclusion (American Psychiatric Association, 2013, Herpertz-Dahlmann, 2015). Hence, the subjects met the equivalent to the DSM-V definition of AN. The sample included Restricting and

Binge/Purge subtypes. Ten healthy adolescent controls with an average age of 14.6 years (± 2.63) were obtained from community news advertisements, including two males. These participants did not meet DSM-IV diagnostic criteria for an eating disorder, as determined by an MA psychologist who was trained in DSM-IV diagnosis. Individuals who met the criteria for Bulimia Nervosa or Binge Eating Disorder were not eligible to participate. All diagnoses were made with the Structural Clinical Interview (DSM-IV) by a clinical psychologist trained and approved in the assessment for the NIH study. Written informed consent and assent for minors was obtained from all potential participants and their parents. The study was approved by the Institutional Review Board of Weill-Cornell Medical College.

2.2. Assessment of severity of illness

The Yale-Brown-Cornell Eating Disorder Scale (YBC-EDS) is a semi-structured, clinician-administered interview used to assess the severity of eating disorder symptomatology (Jordan et al., 2009). Scores are obtained from the YBC-EDS on four domains: preoccupations, rituals, total (the sum of preoccupations and rituals scores), and motivation to change (the sum of the resistance, insight, and desire for change scores for both preoccupations and rituals). Both current and highest experienced severity were recorded, but only the current severity is reported here.

2.3. Computer tasks

Participants were positioned in front of a computer screen and asked to participate in a series of computer tasks that involved responding to images of four foods differing in energy density: Two low energy dense – potatoes (0.75 kcal/g) and rice (1.43 kcal/g) and two high energy dense – pizza (4.08 kcal/g) and M&Ms[®] (5.26 kcal/g). The macronutrient composition was taken from the food packaging, (see Kissileff et al., 2016, for nutrient composition of foods and rationale for selection). All portion sizes were measured in kilocalories.

2.3.1. Liking and healthiness ratings

In separate trials, the participants were presented with images of the four foods and were asked to rate liking and healthiness. Using the computer mouse, they placed a vertical line at an appropriate position along a horizontal line anchored at the left end by “not at all” and at the right by “extremely”. The order of the foods was determined randomly for each participant. The assessment of healthiness was an identical procedure in which participants were asked to respond to the questions, “How much do you like this food?” and “How healthy is this food?”

2.3.2. Frequency of eating

Participants indicated frequency of eating each of the four foods by selecting how often they ate each food from one of four periods: day, week, month, and year. Frequency of eating was quantified in units of days-per-month.

2.3.3. Maximum tolerable portion size

Maximum tolerable portions were measured using a variant of the method of constant stimuli (see Kissileff et al., 2016; for further details), in which participants were shown pictures of foods in varying portion sizes on a computer screen and asked to respond with “yes” or “no” to the question: “Imagine you were going to eat ALL of this food. Would this portion be too big for you to tolerate eating it?” The Point of Subject Equality (PSE) was determined as the portion size around which the probability of the participant responding “yes” was 50% (Watt & Andrews, 1981). The portion size

Download English Version:

<https://daneshyari.com/en/article/7307189>

Download Persian Version:

<https://daneshyari.com/article/7307189>

[Daneshyari.com](https://daneshyari.com)