



Control your cravings: Self-controlled food choice varies by eating attitudes, sex, and food type among Division I collegiate athletes



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ABSTRACT

Eating attitudes are predictive of disordered eating, which can be quite prevalent among collegiate athletes. The present study tested if disordered eating attitudes and the sex of collegiate athletes are related to “self-controlled food choice” for four food types: a dessert, fried food, fruit, and vegetable. In total, 102 athletes completed a disordered eating attitudes assessment and a delay discounting task. For the delay discounting task, athletes chose between one large delayed reward and one successively smaller immediate reward for four food types, and indifference points were computed with lower indifference points indicating greater self-controlled food choice. In this study female athletes showed greater self-controlled food choice for all three tempting food types (dessert, fried food, and fruit), but not the control food type (vegetable). For males, results were moderated by their level of disordered eating attitudes. Overall, these data show that “self-controlled food choice,” measured using a delay discounting task, is a key factor related to sex differences in disordered eating attitudes among college athletes.

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Although collegiate athletes are often regarded as being in peak physical condition, the prevalence of eating disorders among athletes may be much higher than in the general population (Sungot-Borgen & Torstveit, 2004), particularly among female athletes (Martinsen & Sundogen-Borgen, 2013). In general, women are much more likely to develop an eating disorder (National Institute of Mental Health, 2014; Striegel-Moore et al., 2009), as is true for collegiate athletes with female athletes being more likely to report eating disorder symptoms compared to men (Striegel-Moore et al., 2009). One difficult challenge in addressing eating disorders among collegiate athletes is that concern about body weight or shape, which may also indicate an eating disorder (National Eating Disorders Association, 2014), can be encouraged by coaches thereby making disordered eating a “strategic” behavior (Cobb et al., 2003; Sundgot-Borgen, 1994; Thompson & Sherman, 2010).

One factor that is predictive of disordered eating, particularly for women, is attitudes about eating (Halvarsson-Edlund, Sjöden, & Lunner, 2008; Westerberg-Jacobson, Edlund, & Ghaderi, 2010). Disordered eating attitudes are associated with many other factors that can predict disordered eating behaviors, including dietary

restraint (Urquhart & Mihalynuk, 2011). One key factor related to dietary restraint is self-control, or more specifically, “self controlled food choice” (Hofmann, Adriaanse, Vohs, & Baumeister, 2014; Privitera, McGrath, Windus, & Doraiswamy, in press). Self-controlled food choice is correlated with BMI, with greater self-control in choosing high calorie foods typically associated with a lower BMI score (Privitera et al., in press; Schlam, Wilson, Shoda, Mischel, & Ayduk, 2013).

One common measure of self-control utilized in the present study is the delay discounting task (Odum, 2011), for which the predominant view is that this task is a measure of self-control (Odum, 2011; Schlam et al., 2013). Delay discounting is a procedure for testing how people “discount” the value of a larger delayed reward for a smaller but more immediate reward (Odum, 2011; Reynolds, Karraker, Horn, & Richards, 2003; Reynolds & Schiffbauer, 2005). For this procedure, indifference points (described below) are the dependent variable. This procedure is distinct from a delayed gratification procedure, coined the “marshmallow test” (Mischel, Ebbesen, & Raskoff, 1972) in that a delayed gratification procedure tests the ability of a person to resist a continuously available smaller immediate reward for a delayed larger reward, most often measured in units of time (Mischel et al., 1972; Reynolds & Schiffbauer, 2005). The consensus view tends to be that both procedures are a measure of self-control/impulsivity

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(Odum, 2011), although each procedure is likely to be best explained by distinct underlying processes or mechanisms (Odum, 2011; Reynolds & Schiffbauer, 2005; Schlam et al., 2013).

With foods used as the target stimulus, this task is purported to measure “self-controlled food choice” (Privitera et al., in press). In general, the ability to forgo an immediate reward (e.g., a small portion of a “comfort” food) for a delayed benefit (e.g., a larger portion of that food) is the outcome of interest in a delay discounting task (Epstein, Salvy, Carr, Dearing, & Bickel, 2010). Using this task, an *indifference point* is calculated, which is the point at which participants switch from choosing a smaller immediate reward to choosing a larger delayed reward; operationally, lower indifference points indicate greater self-controlled food choice (Ainslie, 1974), and is associated with lower BMI (Hepler, Albarracin, McCulloch, & Noguchi, 2012) and lower obesity rates (Weller, Cook, Avsar, & Cox, 2008).

For athletes, practicing “restriction” in terms of diet (e.g., restricting fat intake to stay lean, or increasing fat intake to bulk up) can be viewed as necessary to enhance performance (Sundgot-Borgen, 1994; Thompson & Sherman, 2010). However, this “norm” among athletes may also contribute to the “restraint” or self-control athletes display for foods. Because eating behaviors vary by sex among college athletes, and self-control and BMI are related, we should expect that self-control for choosing certain types of foods will vary by sex among college athletes. In the present study, we used an exploratory analysis to test this possibility and also look at the possibility that disordered eating attitudes may be related to self-controlled food choice among male and female athletes. To test this possibility for a range of food types, male and female athletes completed a disordered eating attitudes scale and completed a delay discounting task for four food types: a dessert (high fat/high sugar), fried food (high fat), fruit (sweet-tasting), and vegetable (low fat/low sugar). In the present study, the food types were hypothetical, meaning that participants did not actually obtain and eat the foods they chose, but instead they made choices based on hypothetical options. For human-based studies, using hypothetical outcomes is commonly applied (Odum, 2011), although the utility of the delay discounting procedure when using hypothetical outcomes has been criticized (for a critical review see, Soman et al., 2005). For this reason, a rationale for the need to use hypothetical outcomes is further provided in the Procedures section.

Method

Participants

In total, 102 Division IA collegiate athletes from a small university in the Western New York region volunteered to participate. Athletes were recruited through announcements at team meetings and through communications with team coaches on campus. Of the 102 college athletes sampled, 48 were men, 54 were women, mean/SD age was 20.1 ± 1.3 (years), height was 182.1 ± 9.7 (cm), and weight was 71.9 ± 13.4 (kg). Athlete BMI scores ranged from 17.4 to 30.8 with a mean/SD of 23.5 ± 2.5 (kg/m²). Athletes from 12 teams participated (6 men's teams, 6 women's teams). For men, athletes from golf, tennis, cross-country, swimming, basketball, and baseball participated. For women, athletes from lacrosse, soccer, cross-country, swimming, basketball, and tennis participated. Data for the proportion of athletes sampled from each team are given in Table 1. Participants were told in an initial screening not to eat within two hours of the study. Because hunger states can influence food choice and intake (Fedorchak & Bolles, 1987; Yeomans, 2006), athletes who ate within two hours of the study were excluded from data analyses. All athletes identified that they were familiar with,

Table 1

The count and proportion of athletes who volunteered to participate from 12 NCAA Division 1A college teams at the small university. At least half of all athletes on a team were sampled for 8/12 teams selected to participate.

	# Sampled	Total # on team	% Sampled
<i>Men</i>			
Tennis	4	9	0.44
Golf	5	8	0.63
Baseball	7	20	0.35
Cross Country	8	9	0.89
Swimming	13	20	0.65
Basketball	11	12	0.92
<i>Women</i>			
Tennis	2	5	0.40
Basketball	8	12	0.67
Soccer	10	20	0.50
Swimming	18	19	0.95
Cross Country	6	10	0.60
Lacrosse	10	25	0.40
Totals	102	169	0.60

had consumed, and liked the foods for which they were asked to evaluate in the delay discounting task. Participants were asked to rate their liking for each food type on a 5-point scale from 1 = *dislike very much* to 5 = *like very much*. Participants rating their liking above the median (i.e., 3) were included in the analyses; no participants were excluded using this criterion, and liking ratings did not differ by sex. All procedures for this study were approved by the St. Bonaventure University Institutional Review Board (IRB).

Procedures

A quasi-experimental research design was utilized with sex (male, female), and disordered eating attitudes (measured using the Disordered Eating Attitudes Scale (DEAS); Alvarenga, Scagliusi, & Philippi, 2010) as the quasi-independent variables. Indifference points computed using the delay discounting task was the dependent variable.

Participants were observed in a quiet room and first signed a written informed consent. Upon signing the consent form, participants first completed the delay discounting task, which was adapted for use with food items. Using the delay discounting task, participants were asked to choose varying portions of three tempting foods (a piece of cake—dessert, chicken wings—fried food, strawberries—fruit), and one control food (carrot sticks—vegetable). Thus, participants completed the delay discounting task four times (one time for each food). Fig. 1 shows the food image for each delay discounting task. For each food, participants were told, “In the following task, assume you could have each of the foods you will see pictured.” They were then given the option to choose to wait four hours for a whole portion (ten servings) or choose incrementally smaller portions, then incrementally larger portions. For example, a participant began with being offered a whole portion now or a whole portion in four hours, then nine servings now or the whole portion in four hours, and so on until offered one serving now. At one serving, the immediate option increased again until the participant was again offered the whole portion now or the whole portion in four hours. The *indifference point* was measured as the average of the points at which a participant switched from choosing a larger portion of food later to a smaller portion of that food now (Odum, 2011). Using this task, lower indifference points indicated greater self-controlled food choice. Notably, participants did not eat any foods during this task because this could result in confounds, such as changes in hunger, appetite, and the motivational salience of the foods themselves that could impact future choices or responses to food images (Frank

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