Labeling Exercise Fat-Burning Increases Post-Exercise Food Consumption in Self-Imposed Exercisers

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Low-to-moderate physical activity is often labeled ‘fat-burning.’ We show that fat-burning (vs. endurance) exercise labels increase immediate post-exercise food intake in self-imposed exercisers, that is, individuals with low behavioral regulation, high psychological distress, high fatigue levels, and low positive well-being when exercising, but not in individuals with high behavioral regulation.

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EXTENDED ABSTRACT

Individuals may compensate, or even overcompensate, for the energy spent during physical activity via higher post-exercise energy intake, but the reasons for this remain largely unknown (Schubert et al. 2013). Whilst physiological factors and the type and mode of exercise influence post-exercise energy intake (Blundell and King 1999), there is recent evidence that contextual and psychological factors are relevant too (Hall et al. 2012).

The study considers the label given to the exercise bout as one contextual factor that potentially influences post-exercise energy compensation. In particular, we consider the influence of labeling an exercise bout ‘fat-burning’ (compared with the same exercise bout without such name) on immediate post-exercise food intake.

Conceptual Framework

The names of products and services trigger automatic associations in consumers and influence goal-directed behavior (Fitzsimons, Chartrand, and Fitzsimons 2008). This also applies to food; the names and labels of foods have been shown to influence food intake (Irnak, Vallen, and Robinson 2011; Koenigstorfer et al. 2013; Wansink and Chandon 2006). References to fat cannot only be found on food packages, but also on products and services in the exercise domain. For example, treadmills and bicycle ergometers offer ‘fat-burning programs’ and health and fitness clubs offer ‘fat-burning classes.’ The fat-burning label is typically used to describe low-to-moderate intensity exercise bouts.

We predict that labeling an exercise bout fat-burning will increase immediate post-exercise food consumption, because it makes the concept of fat burning salient and individuals believe that activated fat metabolism produces health benefits. However, there are reasons to assume that this labeling effect is influenced by the degree to which individuals self-impose physical activity in order to reach health and body appearance goals. Labeling exercise bouts fat-burning may increase food intake in individuals who exercise as a consequence of externally imposed self-regulation, because physical activity legitimizes rewarding activities from their perspective (Markland and Tobin 2004). In the context of this study, these individuals may perceive exercise in the fat-burning zone as a license to consume (Khan and Dhar 2006) and are thus more likely to compensate for the energy expended during exercise.

Methods

A laboratory experiment was conducted to test our hypotheses. The study employed a one-factorial design with the label given to an exercise bout (fat-burning exercise vs. endurance exercise) as a between-subjects factor. Ninety-six participants were randomly assigned to either the fat-burning label condition or the endurance label condition. Participants were told that they would participate in a market research study to evaluate newly developed training software for bicycle ergometers. After participants had given informed consent for participation they were equipped with heart rate monitors, seated on the bicycle ergometer, and then they completed a twenty-minute low-to-moderate intensity bicycle ergometer ride. During the exercise bout, the label given to the bout was made salient via a poster displayed on the wall in front of participants and on the screen of the bicycle ergometers. In the fat-burning label condition, the poster showed the following sentence: ‘fat-burning exercise – developing training software for exercise in the fat-burning zone.’ In the endurance label condition, the control condition, the poster showed the following statement: ‘endurance exercise – developing training software for exercise in the endurance zone.’ When the participants had finished the bicycle ergometer ride, they were told that they could help themselves to drinks and food whilst completing a survey. Water bottles and a bowl filled with Snyder’s of Hanover Pretzel Pieces were arranged so that participants were out of sight of the experimenter. Participants used a spoon to serve themselves pretzels in a smaller bowl (250 gram capacity) before seating themselves at a table. When they had finished the questionnaire, they were thanked for their participation and fully debriefed before they were released.

The amount of food eaten was measured using a balance (pre vs. post), subtracting any leftovers. The amount of food eaten (measured in grams) was used as the dependent variable in the following analyses. We captured the degree to which individuals self-impose physical activity via the following variables: behavioral regulation (Markland and Tobin 2004; Behavioral Regulation in Exercise Questionnaire; the lower the score, the more participants self-imposed physical activity) and subjective exercise experience, including psychological distress, fatigue, and positive well-being (McAuley and Courneya 1994; Subjective Exercise Experience Scale).

Results and Contributions

The manipulation check showed that participants who exercised in the fat-burning label condition stated that they had burned a higher percentage of fat than participants who exercised in the endurance label condition even though neither exercise intensity nor duration differed between the groups. Moderated regression analyses were performed to assess the influence of the experimental manipulation on food intake. Food consumed (in grams) was the dependent variable, the experimental manipulation, behavioral regulation in exercise (mean-centered), and their interaction were modeled as independent variables. The analysis was repeated for the three measures of subjective exercise experience as dependent variables. The results showed that self-imposed exercisers – individuals with low behavioral regulation and high psychological distress, high fatigue levels, and low positive well-being when exercising – ate more food immediately after an exercise bout when the bout was labeled fat-burning exercise rather than endurance exercise. Labeling an exercise bout fat-burning (unexpectedly) reduced consumption in individuals with high behavioral regulation and in individuals who perceived physical activity as enjoyable rather than stressful. We did not find the reverse relationship in individuals with low fatigue levels.

The study is the first to show that the tendency to compensate for energy expended during physical activity depends on prime-inducing contextual factors (Werle, Wansink, and Payne 2011, 2014), in this instance the label given to the physical activity. Although high food consumption is not necessarily associated with negative health consequences, there is increasing evidence that individuals in developed countries struggle to maintain their energy balance, tending to consume more energy than they expend. In the long run, a positive
energy balance causes weight gain, and weight gain is associated
with several health risks (Pedersen 2013).

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