



Research report

Eat fit. Get big? How fitness cues influence food consumption volumes [☆]Joerg Koenigstorfer ^{a,*}, Andrea Groeppel-Klein ^b, Myriam Kettenbaum ^b, Kristina Klicker ^b^a Technische Universität München, Department of Sport & Health Management, Uptown Munich Campus D, Georg-Brauchle-Ring 60/62, 80992 Munich, Germany^b Saarland University, Institute for Consumer and Behavioural Research, Campus A5.4, 66123 Saarbrücken, Germany

ARTICLE INFO

Article history:

Received 18 September 2012

Received in revised form 7 January 2013

Accepted 28 January 2013

Available online 5 February 2013

Keywords:

Fitness

Food intake

Product packaging

Serving size

Consumption volume

Physical activity

ABSTRACT

Fitness cues on food packages are a common marketing practice in the food sector. This study aims to find out whether and how fitness cues influence food consumption. The results of two field studies show that, even though eating fitness-cued food does not help consumers become more fit, the claims on the packaging increase both serving size and actual food consumption. This effect is mediated by serving size inferences. Also, consumers feel less guilty and perceive themselves closer to desired fitness levels after having consumed the food. The findings show that packaging cues relating to energy expenditure can increase energy intake despite the fact that consumers are not engaged in any actual physical activity while eating the food.

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Introduction

Fitness cues are quite common in food products and are found in categories such as sweet and salty snacks (e.g., *Farmer's Fitness* snack), drinks (e.g., *Powerade* Sports water), cereals (e.g., *Nestlé's Fitness* cereal), packaged foods (e.g., *Knorr's Active* soup), dairy products (e.g., *Müller's Fitness* yogurt), breads (e.g., *Delba's Fitness* bread), and spreads (e.g., *Fit & Aktiv* bread spread). In an effort to show the importance of fitness cues, we assessed all products of the food section in a mid-sized supermarket and found that 67 products used fitness cues in either the name of the product, the slogan, or a picture on the package. To date, it remains unclear whether fitness cues affect energy intake. This is relevant for many consumers because maintaining or lowering one's body weight is an important goal to an estimated 72% of the US population (Serdula et al., 1999). This study therefore looks at whether and how the implementation of fitness cues on the packaging of foods influences food consumption.

There is recent evidence that making the concept of physical activity salient to consumers can increase the amount of snack food that consumers serve themselves (Werle, Wansink, & Payne, 2011). Thus, fitness in association with foods may do more harm than help for consumers who are trying to attain health-related goals by reducing serving sizes. However, it remains unclear

whether marketing stimuli – the product packaging in particular – can increase actual consumption volumes by using fitness cues. This study aims to partially fill this gap of research and expects two mechanisms to be relevant in this context: (1) liberation effects of fitness cues on health-related goals and (2) the mediating effects of serving size inferences of fitness-cued food on consumption volumes.

Liberation effects of fitness cues on health-related goals

Consumers make day-to-day food decisions that are driven by multiple goals. These goals are often incompatible to each other and therefore produce goal conflicts in consumers, such as the conflict between eating tasty food and wanting a slim and fit body (Fishbach & Dhar, 2005; Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008). In order to solve such conflicts, consumers liberate themselves from attaining one goal vs. another. Liberation describes the process when individuals free themselves from pursuing one goal (here: health-related goal) over an incongruent goal; the progress that individuals make towards a focal (health) goal then provides a justification to them for pursuing opposing goals, such as eating tasty food (enjoyment-related goal). However, not only actual but even expected goal progresses can lead to moving away from an active health goal (Fishbach & Dhar, 2005; Fishbach, Friedman, & Kruglanski, 2003).

In the food domain, liberation processes have been observed in response to favorable nutrient claims on the product packaging (e.g., low-fat; Wansink & Chandon, 2006), misleading portion size information on the product packaging in the sense that products

[☆] Acknowledgement: This work was supported by a fellowship within the Postdoc-Programme of the German Academic Exchange Service (DAAD).

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appear smaller than they actually are (e.g., small, medium, and large portions; Aydinoglu & Krishna, 2011), small package sizes (Coelho do Vale, Pieters, & Zeelenberg, 2008), and names that are implicitly associated with meanings of healthfulness of foods (e.g., names of fast-food restaurants, Chandon & Wansink, 2007; names of meals on a menu, Irmak, Vallen, & Rosen Robinson, 2011). Consumers rely on these cues that (seemingly) help them attain health-related goals and, as a consequence, they reduce their monitoring of food intake. This causes overconsumption because consumers feel safe after having externalized their internal control mechanisms. Most importantly, this liberation mechanism can take place despite the fact that the focal health-related goal is actually not fulfilled (Wilcox, Vallen, Block, & Fitzsimons, 2009).

This study is concerned with the liberating effects of fitness cues on food consumption. The concept of fitness is compatible with health-related goals, whereas it is incompatible with enjoyment goals because it needs effort and time to become fit (Fishbach & Shah, 2006). Fitness cues on the food packaging may indicate to consumers that eating the food will help them become fit. They may then enjoy the food that (seemingly) helps them achieve higher fitness levels and reduce the monitoring of food intake (Fishbach & Dhar, 2005). Thus, our first prediction is that the presence of fitness cues on food packaging will cause consumers to perceive themselves closer to desired fitness levels compared with food packages that do not contain fitness cues.

The liberation process should also make consumers feel less guilty after having consumed the food. Guilt is an “unpleasant emotional state associated with possible objections to [...] actions, inactions, circumstances, or intentions” (Baumeister, Stillwell, & Heatherton, 1994, p. 245). In the context of food consumption and health, guilt is often caused by self-regulation failure (e.g., regretting a consumption episode of palatable food; Giner-Sorolla, 2001). The presence of fitness cues may reduce the tendency to feel guilty because the claim gives consumers a justification for consumption (Wansink & Chandon, 2006). We therefore predict that the presence (vs. absence) of fitness cues on food packaging will make consumers feel less guilty about having consumed the food.

Furthermore, fitness cues on the food packaging may affect actual consumption volumes of foods. In Fishbach and Dhar’s (2005) study on liberating mechanisms, students expecting to work out stated higher intentions to have an indulging dinner compared with students who actually exercised. Werle et al. (2011) showed that simply reading about physical activity can make consumers pour up to 59% more of snack foods into a bowl. In their study, Chex Mix and M&M’s were an ostensibly unrelated gift to participants for participation in the study. In a laboratory setting, Albarracín, Wang, and Leeper (2009) observed a higher consumption volume of raisins after students had viewed exercise-related (vs. control) print advertisements. Applying these findings to food marketing practice, one can assume that fitness cues on the packaging of foods increase consumption volumes. Fitness is associated with energy expenditure, and higher energy expenditure means that consumers can eat more to keep an isocaloric energy balance (or produce an energy deficit). We therefore predict that the presence of fitness cues on food packaging will increase food consumption compared with food packages that do not contain fitness cues.

Perceived serving size

Assuming that liberation mechanisms take place in response to fitness cues and that individuals consume more of fitness-cued food (vs. food without such cues), it remains unclear how this mechanism works. Consumers have an intuition about how big a typical serving of a certain food is. When consumers serve themselves a portion, this intuitive belief is often more relevant than explicit information that is provided in figures (e.g., on the

Nutrition Facts Panel; Wansink & Chandon, 2006). According to the Code of Federal Regulations (Title 21 – Food and Drugs, §101.9), a serving size means “an amount of food customarily consumed per eating occasion by persons 4 years of age or older which is expressed in a common household measure that is appropriate to the food.” This study looks at the perceived serving size, that is, consumers’ inferences about what amount of food is appropriate to be consumed on a typical eating occasion (Wansink & Chandon, 2006). The presence of fitness cues likely affects this intuition. We expect that consumers will estimate the serving sizes to be bigger because fitness cues make the food appear more suitable for achieving long-term health-related goals (similar to health halos; Chandon & Wansink, 2007) and because eating the food may compensate for both (prior or anticipated) intake of palatable foods and greater energy expenditure with increased fitness levels (Werle et al., 2011). Biases in serving size estimations should increase consumption volumes because consumers may adjust the amount of food they eat according to what they consider is appropriate. Based on these arguments, we predict that perceived serving size mediates the effects of the presence (vs. absence) of fitness cues on food consumption.

Study 1

Study 1 tests our prediction that the presence (vs. absence) of fitness cues on the food packaging makes consumers perceive larger serving sizes, and that this biased perception increases the amount of food served (an antecedent of consumption). It further tests whether the presence of fitness cues makes consumers feel less guilty and perceive themselves closer to desired fitness levels after having consumed the food.

Design and participants

A one-factorial experimental design manipulating the presence (vs. absence) of fitness cues on the food packaging between participants was applied. One hundred consumers (54 women; mean age 37.1 years, $SD = 12.2$) participated in the study.

Procedure and measures

Participants were recruited in a mall and invited to come to a table in a quiet area of the mall. To conceal the purpose of the study, participants were told that the researchers were interested in their opinion about a new food product. They were also told that they would be asked to try some of the food, that is, a new trail mix. After participants had given their informed consent for the participation in the study, they were shown a package that was either labeled ‘fitness trail mix’ (fitness cue condition) or ‘trail mix’ (neutral condition). It contained 125 g of trail mix (i.e., a typical amount that is sold in supermarkets). It was put on the table and participants were asked to read a brief description of the product. The description was as follows: “This [fitness] trail mix contains dried fruits and nuts (e.g., almonds). The ingredients help people stay concentrated [active]. The seeds provide important minerals and vitamins for people’s bodies and thus support them to stay mentally [physically] fit” (fitness cue manipulation in parentheses).

After participants had read the description, they were asked to state what the amount of the trail mix is that they would consider a typical serving size (in grams). Next, participants were asked to serve themselves as much of the trail mix as they would like to have as a portion to eat now. Plastic bowls (12 cm in diameter, 5 cm deep) were provided to the participants. The amount of trail mix poured was measured via a scale unbeknownst to the partici-

pants. They were asked to taste the trail mix then and answer some questions about the food (e.g., texture, sweetness). When the participants had finished the survey and tasted the product, they stated how guilty they felt about having eaten the trail mix (1 = *not guilty at all*, 5 = *very guilty*). Also, participants were asked how close they felt to their ideal fitness on a scale ranging from 0 (*far away from desired fitness*) to 100 (*desired fitness fully reached*). At the end of the survey, participants were fully debriefed about the purpose of the study.

Results and discussion

Participants poured on average 37.6 g ($SD = 26.0$; equal to 188 calories) trail mix into the bowls. To test our prediction that perceived serving size mediates the effect of fitness cues implemented on the product packaging on the amount of food served, regression-based mediation analyses were computed (Preacher & Hayes, 2004). Gender did not influence the results of any of the calculations except for a main effect on the amount of food served (i.e., men served themselves more food) and will therefore not be discussed further. The total effect of the presence (vs. absence) of fitness cues on the amount of trail mix served was positive and significant ($b = 15.08$, $SE = 5.00$, $p < .01$). Participants served themselves on average 15.1 g (equal to 76 calories) more trail mix when the food was named and described as fitness trail mix ($M = 45.1$ g, $SD = 31.2$; equal to 226 calories) compared with the food named and described as trail mix ($M = 30.0$ g, $SD = 16.6$; equal to 150 calories). Thus, in the fitness cue condition, the amount served increased by 50% compared with the control group; in the latter, participants on average served the amount of a serving size as defined by the Code of Federal Regulations (Title 21 – Food and Drugs, §101.12) which is 30 g for trail mix.

The effect of the independent variable (here: presence of fitness cues) on the mediator (here: perceived serving size in grams) was also significant ($b = 20.10$, $SE = 7.48$, $p < .01$). Participants estimated the serving size to be larger in the fitness cue condition ($M = 59.7$ g, $SD = 47.5$) compared with the neutral cue condition ($M = 39.6$ g, $SD = 23.2$). We next computed the effect of perceived serving size on the amount of trail mix served, controlling for the presence (vs. absence) of fitness cues on the food packaging. The results showed that perceived serving size mediates the effects of the experimental manipulation on the amount of trail mix served ($b = 6.38$, $SE = 2.65$, $p < .05$; the bias-corrected and accelerated confidence intervals exclude zero [lower 95% $CI = 1.62$, upper 95% $CI = 14.44$]). The effect of the presence (vs. absence) of fitness cues was not significant when the mediator was modeled as an additional predictor ($b = 8.69$, $SE = 4.58$, $p = .06$), arguing for an indirect-only mediation (Zhao, Lynch, & Chen, 2010).

Beside the proposed mediation mechanism, we predicted that consumers would feel less guilty about having eaten the food and perceive themselves closer to their desired fitness levels when they tasted the fitness trail mix (vs. trail mix). One-factorial ANOVAs were computed to test these predictions. The results showed that participants felt less guilty about having eaten the fitness trail mix compared with the trail mix ($F(1,98) = 5.26$, $p < .001$, $\eta^2 = .131$; see top of Fig. 1). Participants who ate the fitness trail mix also perceived themselves closer to desired fitness levels than participants in the neutral cue condition ($F(1,98) = 7.20$, $p < .01$, $\eta^2 = .068$; see bottom of Fig. 1).

Study 1 showed that fitness cues on the product packaging make consumers pour larger amounts of food. Perceived serving size provides an explanation for increased amounts of food served. The benchmark for acceptable intake shifted: both perceived serving size and actual amount of food served increased by about 50% in the fitness cue condition compared with the neutral condition.

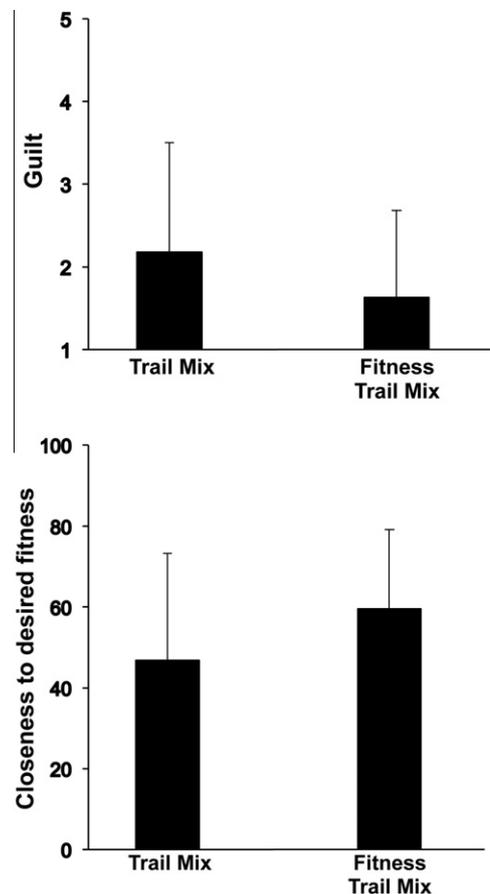


Fig. 1. Guilt and perceived closeness to desired fitness after the consumption of food with (vs. without) fitness cues (Study 1). Error bars indicate standard deviations. The differences in guilt and closeness to desired fitness are statistically significant between the experimental groups, as revealed by ANOVAs.

In the latter condition, the amount of food served corresponds to food industry standards.

Limitations of Study 1 are that actual consumption volumes were not assessed and that the participants poured the food in the presence of the interviewer. Another limitation is that the order of measurement may have influenced the results. That is, consumers may have poured more or less trail mix into their bowls because they were asked about the portion size of the food before they served themselves the food. As a consequence, consumers may have monitored their food intake more than in a situation where they can pour and consume food without such instructions. To rule out the potential influence of assessing the mediator before pouring the food, Study 2 was conducted. Study 2 assessed actual consumption volumes in a task where consumers were not made aware of the characteristics of the food (e.g., via portion size estimations or product descriptions) and where the interviewer was out of sight for the participants while they served and ate the food. The food was provided to consumers as an ostensible unrelated thank-you for participation in the study. To increase the generalizability of the findings, consumers could freely choose whether they served themselves food or not. We predicted that more consumers would serve themselves food and that those who served themselves food would eat more of the food when it is labeled fitness compared with food without such labeling.

Study 2

Study 2 tests our prediction that the presence (vs. absence) of fitness cues on the food packaging increases both the consumption

likelihood and the actual amount of food eaten in a situation where consumers are not made aware of the perceived serving size (or any benefits associated with the food) and where no interviewer may affect the amount of food served. It thus provides a closer measure of unintended consumption compared with Study 1.

Design and participants

The study used a one-factorial experimental design, where the presence (vs. absence) of fitness cues on the food packaging was manipulated between participants. One hundred thirty-five students (103 women; mean age 25.9 years, $SD = 8.5$) participated in the study.

Procedure and measures

Participants were recruited in the hallway of a university building. To conceal the purpose of the study, participants were told that the researchers conducted an on-campus consumer satisfaction survey on the facilities and infrastructure of the university. If students agreed to participate, they were given a survey about their satisfaction with the university. When the participants received the questionnaire, they were also told that they could serve themselves trail mix as a thank-you for their participation and have it while filling out the survey. The trail mix was provided in a package that was either labeled 'fitness trail mix' (fitness cue condition) or 'trail mix' (neutral condition). The package was placed on a table and participants used a quarter cup scoop to dish out trail mix and pour it into a plastic bowl (12 cm in diameter, 5 cm deep). The table that displayed the food was out of sight for the interviewer and other participants.

The weight of the trail mix that was poured into the bowl (pre vs. post; minus leftovers) was measured via a scale unbeknownst to the participants after they had left the area and before the trail mix was refilled. To fill out the 8-min survey, participants took a seat at tables. Upon completion of the survey and collection of the used bowls, participants were fully debriefed about the purpose of the study. The dependent variable of interest was the amount of trail mix consumed. None of the participants shared any of the trail mix.

Results and discussion

The percentage of participants who served themselves trail mix was higher in the fitness cue condition (76.6%) than in the neutral condition (42.3%, $\chi^2(1) = 16.32, p < .001$). Gender did not influence the results of this analysis, or any other analyses, and will not be discussed further. A one-factorial ANOVA with the experimental manipulation as independent variable and the amount of trail mix consumed as dependent variable was calculated to test our prediction that fitness cues increase food consumption. Given that participants served themselves trail mix, the amount of trail mix eaten was higher in the fitness cue condition ($M = 33.4$ g, $SD = 20.7$) than in the neutral condition ($M = 24.4$ g, $SD = 16.9$; $F(1, 77) = 4.06, p < .05, \eta^2 = .050$; see Fig. 2). Accordingly, considering the whole sample of participants, the mean amount of trail mix eaten was higher in the fitness cue condition ($M = 25.6$ g, $SD = 23.0$) compared with the neutral condition ($M = 10.3$ g, $SD = 16.3$; $F(1, 133) = 20.13, p < .001, \eta^2 = .131$).

The findings of Study 2 showed that the increase in the amount of food eaten can indeed be attributed to the fitness cues, and that it is not due to having consumers explicitly estimate serving sizes. The study also rules out the possibility that the presence of others may have driven the results obtained from Study 1. In Study 2, consumers chose more often to have foods with (vs. without) fitness cues. The study thus provides evidence that both actual consump-

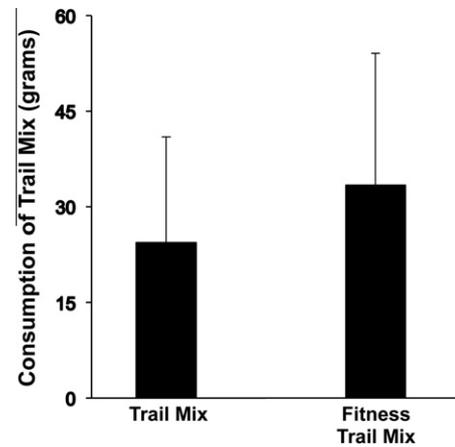


Fig. 2. Consumption volumes of food with (vs. without) fitness cues (Study 2). Error bars indicate standard deviations. The difference in consumption is statistically significant between the experimental groups, as revealed by ANOVA.

tion likelihoods and amounts increase in response to fitness cues on the food packaging.

General discussion

Consumers make hundreds of eating decisions each day and tend to rely on consumption norms and heuristics when they make these decisions (Wansink, 2004). This study showed that marketing stimuli on the product packaging that relate to fitness affect consumers' intuitive beliefs about food consumption (here: perceived serving size). As perceived serving size increases, the amount of food served increases. Furthermore, fitness cues reduce the tendency to feel guilty after having consumed the food and they make consumers perceive themselves closer to fitness goals. The latter measures indicate the degree to which consumers think that they have made food decisions that help them attain long-term health-related goals. Eating fitness-cued foods thus provides a pre-commitment device to consumers that makes them feel having reached desirable goals.

Our studies extend previous findings on liberation mechanisms showing that not only cues directly relating to food components can lead to an increase in actual consumption volumes (such as low-fat claims; Wansink & Chandon, 2006) but also cues relating to energy expenditure (here: fitness). This is an important finding because these components are not independent from each other and they determine one's energy balance. More importantly, consumers have not made any actual progress towards the goal (here: towards desired fitness levels or producing an energy deficit) on an objective level. The product packaging can thus make consumers feel that they have become more fit despite the fact that they are not engaged in any actual physical activity while eating the food.

Study 1 provides some indication that fitness cues lead to overconsumption because the participants served about 50% more of the trail mix compared with the recommended serving size (30 g). In Study 2 where the actual amount of the food eaten was assessed, consumers ate about 10% more than what a serving size would recommend and about 37% more than the control group. One can argue that such overconsumption is not in conflict with attaining health-related goals when the food product is considered to be healthful. However, trail mix is a food of high energy density and – even more importantly –, it does not increase consumers' objective fitness levels. Thus, overconsumption of the food may be in conflict with the goal to induce an energy balance or an energy deficit in individuals given that other components of energy intake (e.g., following eating occasions) and energy expenditure (e.g., exercising behavior) do not change.

Food manufacturers can use these findings: implementing fitness cues on the packaging may increase consumption volumes and hence sales volumes of foods. Besides naming a food ‘fitness,’ claims and pictures are used by manufacturers to trigger fitness associations in consumers’ minds when they look at the food packaging. However, public policy makers aim to avoid overconsumption tendencies in consumers. Agencies such as the *Food and Drug Administration* may educate consumers better about the interactions between physical activity cues and food intake, especially when consumers remain physically inactive. Also, agencies may evaluate the scientific evidence when food manufacturers make claims on the product packaging about fitness and food consumption. Cues that may be relevant for professional athletes may be irrelevant and misleading for persons that are mainly sedentary.

One limitation of our study is that we only assessed one product category. Knight and Boland (1989) have argued that the perception of the product category as dietary forbidden or dietary permitted may affect how consumers respond to foods. While we would expect that the findings can be replicated for foods that are classified dietary-permitted or neutral, opposite effects seem likely for dietary-forbidden foods. The concept of fitness is incompatible with foods that are typically perceived as dietary forbidden (e.g., normal-fat potato chips or pasta meals) and therefore, the implementation of fitness cues may have reverse effects on consumption volumes (Provencher, Polivy, & Herman, 2009; van Kleef, Shimizu, & Wansink, 2011). Future studies should explore these predictions.

Another limitation of our study is that we did not look at personality variables of consumers that may moderate the effect of fitness cues on food consumption. The effect may be stronger in dietary restrained eaters because they tend to externalize their food monitoring to greater extents than unrestrained eaters in order to (seemingly) attain health-related goals, such as reducing body weight (Scott, Nowlis, Mandel, & Morales, 2008). Furthermore, the effect may be smaller in athletes because actual physical activity is not in conflict with enjoyment-related goals. Athletes may be less prone to feel that they have reached desirable fitness goals by eating fitness-cued food.

In future studies, researchers may identify situations where the tendency to overconsume can be prevented, even in the presence of fitness cues. It is unlikely that adding back-of-pack nutrition information on the packaging prevents liberating mechanisms because descriptors on the front – such as those implemented in the studies – have stronger effects (Balasubramanian & Cole, 2002). However, additional front-of-pack claims referring to how much energy consumers would have to be spent per serving intake (e.g., “To burn off the calories of one serving of the food, an average-sized adult would have to walk for 30 min on a moderate intensity”) may reduce the effect.

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