

How exercise cues at fast food restaurants influence peoples' choice and evaluation of fast food



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Abstract

Several studies showed that the prevalence of obesity is rising worldwide. At the same time, it is common for many food companies to use various exercise or fitness cues to market their products. This marketing strategy is particularly common among companies with foods that are high in fat, salt, sugar, or calories. Several studies investigated the influence of the cues on food choices, but results of these studies are mixed.

In this study, we tested the effect of exercise cues on a fast food menu board on hypothetical choices that people make. Further, we tested whether exercise cues on a menu board impacted how people estimate the number of calories, consumption guilt, , desired fitness level, likability of own choice, perceived healthiness of online menu and of their own choice. In a between subject experimental design, participants (N=152) were randomly assigned to one of the two menu board conditions. In the 'exercise fast food menu' condition, participants had to take a look at the menu and imagine that it was lunch time and they wanted to make a choice. In the control condition, the same menu was shown, but now without exercise cues displayed. Exactly the same choice situation had to be imagined by the participants. The questionnaire including the menu boards was administrated online. Immediately after making a hypothetical choice, participants were asked to rate the menu on various characteristics.

Results showed that participants on average selected foods and drinks totalling 1059 kcal calories. No difference in the total number of calories selected was observed. The expected effect of exercise cues on participants' hypothetical choice was not found, neither the effect of exercise cues on underlying mechanisms was found.

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1. Introduction

1.1 Obesity

There is evidence that the prevalence of obesity among children and adults is rising (Hedley, Ogden, Johnson, Curtin, Flegal, 2004). In the United States, the obesity problem is related to every state, both sexes, all age groups, educational level and smoking statuses (Mokhad, Serdula, Dietz, Bowmnan, Marks, Koplan, 1999). More than 35 % of men and women and 16, 9 % of children and adolescent were obese in 2009-2010 in the United States (Ogden, Carrol, Flegal, 2012). Not only the United States faces the problem of obesity, but similarly in the rest of the world the obesity problem has a growing tendency (Figure 1.). Indisputably, the costs of obesity and overweight are high, moreover the obesity in adulthood causes decrease in a life expectancy (Peeters, Barendregt, Willekens, Mackenbach, Manun, Bonneux, 2003). Authors Mokhad et al., (1999), Ogden et al., (2012) and Peeters et al., (2003) agreed that the obesity problem should remain and even become higher public health concern and certain prevention against this disease should be brought into action.

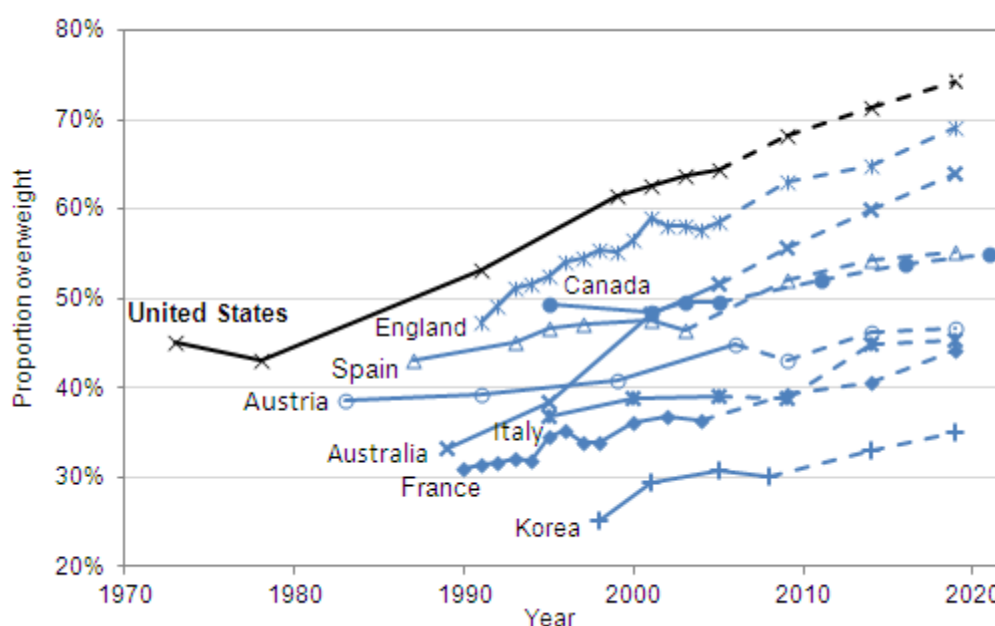


Figure 1. Obesity rates in selected OECD countries (OECD, 2012).

One of the major causes of obesity is an insufficient amount of physical activity - people do not perform enough physical activity on a daily basis (Heine and Windier, 1997). However, the main threat to obesity nowadays is the overconsumption of food and drinks (Chou, Gorssman, Saffer, 2012). People make on average 200 choices per day related to food and drinks and based on the current prevalence of obesity, they often make the wrong choices (Wansink, 2006). Raghunathan, Naylor and Hoyer (2006) showed that people mainly overeat foods that are generally perceived as unhealthy, because they have a strong association between unhealthiness and tastiness. Drewnowski and Almiron- Roig (2012) also indicate that energy- dense and fatty foods is the most palatable food. Further, according to Wansink (2006) there are several reasons why people overeat, but certainly it is

not only a hunger that triggers individuals' overconsumption. He states that people mainly overeat because of the packages, plates, names, numbers, labels, colours, candles, shapes, smells and other environmental cues. For instance, studies (Wansink, 2006) showed that people serve themselves more from bigger packages than from smaller packages. People also tend to overeat products that are labelled as "low fat". Their calorie intake is higher when they eat from larger plates than from smaller plates. And they have a tendency to eat more when the colour contrast between their food and the plate from which a food is served is lower than when the colour contrast is higher (Wansink, 2006).

Powell and Nguyen (2013) concluded that individuals have higher energy intake the day when they eat at fast food restaurants, which mostly serve unhealthy food, compared to the day when they eat at home. Moreover, two studies (Jeffery, Baxter, McGuire, Linde, 2006 and Binkley, Eales, Jekanowski, 2000) emphasized an association between a fast food consumption and obesity.

Despite the attempts of the World Health Organization (WHO, 2004) and national governments (Wang, McPherson, Marsh, Gortmaker, Brown, 2011 and National Audit Office, 2001) to tackle the obesity problem, the obesity worldwide is still rising (Hedley et al., 2004). Moreover, it is predicted that obesity figures will continue to grow in a near future (Figure 1). There are several reasons why efforts from WHO and national government keep on failing and why obesity rates are steadily growing (Ogden et al., 2004).

Nutrition advocates and doctors group (Time, 2013 & ABC NEWS, 2013) are blaming fast food restaurants for causing obesity. Before and after Olympic Games 2012 in London, there was a debate going on in media about McDonald's sponsorship of Olympic Games, the event that is associated with top athletes and top achievements (Daily Mail, 2012, Yahoo, 2012, TIME Olympics, 2012). One of the questions raised by media was whether McDonald's is a right choice for Olympics' sponsorship, especially during the time when obesity is a disputable topic among the general public as well as health specialists. Media and also public health professionals (Fox News, 2012, Time, 2013, ABC NEWS, 2013) expressed worries about the message that Olympic Games are sending to the overweight population by keeping McDonald's the main sponsor and therefore keeping the link with fast food chain. British doctor's group (Cheng, 2012) raised a sarcastic question; "How many athletes actually engage into fast food before competing for medals"? Moreover, the fact that McDonald's operates more playgrounds than any other private entity in the US (Schlosser, 2001) is believed to be no coincidence but a conscious intention to link a physical activity with the fast food chain.

However, McDonald's is not the only company that tries to make the connection with physical activity. Similarly, another fast food chain, Burger King, was trying to create the connection between their brand and physical activity by sponsoring Dutch soccer league, Eredivisie, and promoting special menu "Taste the fire" (Burger King's soccer menu, 2012). Coca Cola is another brand which products are generally perceived as high in sugar and calories products. However, the brand tries to offset this perception by making connection with a physical activity in consumers' minds. Coca Cola has emerged on its website "Work It Out Calculator" (Coca Cola, 2010), the program that indicates brand's connection with physical activity. Another example is brand Ritter Sport Chocolate (Ritter Sport Chocolate, 2013) which initiated connection with physical activity by using the word 'sport' in its brand name.

It looks like that some companies which products are perceived as unhealthy are trying to offset this label by using different strategies. It may seem that they are trying to balance the connection between their brand and unhealthiness using exercise cues, creating health halos or using other strategies. It is important to note that mainly brands that are associated with products high in calories and sugar are trying to balance this label by making a connection with physical activity (Brand eating, 2012, Burger King, 2012, Gettin fit, stay if fit, 2010).

Despite the accusation of the media, there is no empirical evidence that shows the influence of exercise cues on peoples' mind and subsequent fast food consumption. Although some studies (Dowray, Swartz, Braxton, Viera, 2012, Van Kleef, Shimizu, Wansink, 2011, Albarracin, Wang and Leeper 2009, Koenigstofer, Groeppel- Klein and Kettenbaum, Klicker 2012 and Wansink and Payne, 2010) were done on the topic of exercise cues and food consumption, they only examined consumption of healthy snacks and regular food. However, no studies have yet been done on influence of exercise cues on consumers' fast food evaluation and choices. Moreover, there is a discrepancy in conclusions between these studies which also gives the basis for the aim of this research. At the time of increasing obesity, growing popularity of fast food restaurants and attempts from companies to connect brands with physical activity, the aim of this research is to examine how consumers respond to the connection between fast food and exercise cues. More precisely, the objective of this study is to find out how exercise cues at fast food restaurants influence peoples' choice and evaluation of fast food.

1.2 Study overview

Therefore in the second chapter, we will discuss studies on a topic of exercise cues and food consumption. Then, we will examine which mechanisms may explain consumer responses to exercise cues connected to fast food menus. Chapter 3 reports the methodology of the experiment that was designed to answer the research question. In this experiment, realistic fast food menu boards were presented to participants in an online environment. Half of the participants received a fast food menu including exercise cues (exercise condition) and the second half of the participants received a neutral fast food menu (control condition). In both conditions, participants were asked to make a choice and further answer several questions. In the next chapter we presented our results. Finally, potential implications and limitations of the study as well as recommendations for further research are discussed in chapter 5.

2. Theoretical framework

In this chapter, we will discuss different theories relevant for understanding consumer responses to exercise cues in relation to food consumption. We will start with a practical perspective on the common strategies of diverse food companies to use exercise cues in the marketing and promotion of their products. Then we will present the studies that examined the effects of different exercise cues on food consumption. Results from these studies varied depending on the way exercise cues were presented and the type of food that was presented to participants. Further, we will present several potential underlying mechanisms that may explain what is going on in peoples' minds when they are exposed to exercise cues and food at the same time. Based on the discussion of the supposed mechanisms we will come up with hypotheses that will be tested in an experimental study.

2.1 The use of exercise cues in marketing and promotion by food companies

Food companies are using different ways to connect a food product with a physical activity. As it will be demonstrated later in this chapter, exercise cues and health halo claims on food packages or exposed to consumers other way are commonly used marketing strategies of food companies (Chandon & Wansink (2007) argue that the way food is marketed is one of the main reasons for the current worldwide obesity epidemic. This is not surprising as the way food packages are designed plays an important role in consumer decision making, as they are salient at the moment of choice (Chandon & Wansink, 2007).

2.2 Marketing strategy; linking exercise cues with indulgent food

There are numerous examples of food companies that use exercise cues on their food packages or other marketing activities. For example, Kellogg's used exercise cues as a marketing strategy by offering Special K breakfast cereals that contained a free 10-minutes exercise DVD in a box (Figure 2). The other promotion from Kellogg's consisted of collecting 5 codes from any Kellogg's packages rewarded by one year free subscription for Shape Magazine, the magazine that focuses on healthy diet and fitness topics.



Figure 2. Kellogg's promotion of giving away free exercise DVD with Kellogg's Special K (Gettin fit, stay if fit, 2010).

Another way to connect brand's name with physical activity is using exercise cues in a brand name. Ritter Sport Chocolate (Figure 4) is examples of this strategy.

Figure 4. Ritter Sport Chocolate using exercise cue, “sport”, in its brand name (Ritter Sport Chocolate, 2013).



Sponsorship is also a commonly used marketing strategy that helps companies to make a connection with physical activity (Lee & Fielding, 2010). Sponsorship can be defined as companies' investment of money into sport teams and sport organization in order to increase brand awareness, strengthen brand image and increase sales. Companies that were among the first ones who used the concept of modern sport sponsorship were US Railroad Company, Coca-Cola and Kodak. US Railroad Company sponsored the rowing race between Yale and Harvard and Coca-Cola and Kodak were sponsors of Athens Olympic Games in 1896. Burger King is the main sponsor of Eredivisie, the highest football league in the Netherlands. During a specific period, the company offered menus related to football, named 'Taste the fire' (Figure 6) and the chance to win tickets for Eredivisie matches.



Figure 6. Burger King's soccer menu, Taste the fire (Burger King, 2012).



Figure 7. McDonald's as an official sponsors of Olympic Games in London 2012 (WFXD, 2012).

The other brand that uses sponsorship as the way to connect brand's name with physical activity is McDonald's (Figure 7). McDonald's is an official sponsor of the Olympic Games since 1976. Even though there was a debate in the media about McDonald's controversial sponsorship of Olympic Games 2012, the Olympic Committee defended the choice of sponsors by stating that during the increasing financial demand for Olympic Games it is difficult to hold on to its values (Daily Mail, 2012, Yahoo 2012, TIME Olympics, 2012). During the Olympic Games 2012, McDonald's was offering menu "Flavours of the Game" (Figure 8) that contained six dishes related to the places where Olympic Games occurred in the past. Also Coca Cola is one of the main sponsors of Olympic Games (Figure 9.), keeping the sponsor relationship with Olympic Games since 1928.



Figure 8. McDonald's offering menu "Flavours of the Games" during Olympic Games in London 2012 (Brand eating, 2012).



Figure 9. Coca Cola as an official sponsor of Olympic Games in London 2012 (Coke Corporate Responsibility, 2012).

Bragg, Yanamadala, Roberto, Harris, Brownell (2013) studied the occurrence of athletes in connection to foods and concluded that youth are exposed to commercials that show athlete endorsements of food that are energy dense and nutrient poor. LeBron James, Serena Williams and Peyton Manning are the athletes with the highest contribution to the marketing of unhealthy food.

Besides sponsorship of the Olympic Games, Coca Cola is using online marketing in order to connect its' name with physical activity. The company launched on its website *Work It Out Calculator* (Figure 11.), online programme that indicates brand's connection with a physical activity. Basically, the visitor of the website picks a drink, and the calculator shows how many calories the drink contains, certain activities and the amount of time person has to engage in those activities to burn the calories from the consumed drink.

Work It Out Calculator

Select your favourite Coca-Cola drink to generate activity suggestions for a healthy, balanced lifestyle

g

Picture 10. Coca Cola's online program, Work it Out Calculator, calculating the amount of time person has to engage into a certain physical activity in order to burn calories from consumed drink (Coca Cola, 2010).

2.3 Consumer responses to exercise cues

2.3.1 Influence on food intake

As it was demonstrated earlier, food companies are commonly using exercise cues in the promotion of their products. Several studies examined the influence of exercises cues on people's food intake and other variables of interest (e.g. food evaluation, calorie estimations). However, these studies came up with mixed results.

Albarracin, Wang and Leeper (2009) tested people's snack consumption after being exposed to two different exercise cues, exercise ads in the first experiment and action words in the second experiment. In the first experiment, participants in an experimental group were presented with exercise advertisements and participants in a control group with neutral advertisements. After watching advertisements, participants were asked to rate the efficiency and appeal of the ads. Immediately, after rating, participants were offered raisins and asked to eat as much raisins as they wanted and additionally rate the taste of raisins in a supposed taste test. Participants in the experimental group ate on average 18 kcal relative to 12 kcal eaten by participants in the control

group. In the second experiment, participants in an experimental group were exposed to the action words (active, go) and participants in a control group were exposed to neutral words (pear, moon). The experiment was conducted in such a way that both groups became consciously aware of the stimuli. After being exposed to the words, participants were offered 15 M&Ms, 15 raisins, and 15 peanuts with instructions to eat as much as they wanted and consequently to rate the food. Results from the second experiment are aligned with the results from the first experiment, and show that participants exposed to action words ate on average more calories compared to participants exposed to neutral words. However, in the first experiment, only twenty raisins were offered to participants. Moreover, raisins are generally perceived as a healthy snack and that might have been a reason for increased consumption in the experimental group, where exercise cues were made salient.

Werle, Wansink and Payne (2010) investigated if just thinking about a physical activity, without actually being engaged in any, makes people eat more snacks. In the experiment, people were randomly assigned to three groups. In the first group, participants got a physical activity description formulated as 'tiring' exercise, in the second group participants got a physical activity description emphasising the fun of it and in the control group participants got no description at all. In order to disguise the true aim of the study, participants were informed that the experiment was about their shopping behaviour and as a reward for participation they will get free snacks. After answering questions about their shopping behaviour, participants were given description of physical activity regarding to the group they were assigned to. Then, they were asked several questions related to their emotions, evaluations of the activity described, their level of hunger and general demographic questions. As a reward for taking a place in the experiment, participants were instructed to serve themselves as much snacks as they wanted (M&Ms and Chex Mix). Results suggest that participants in the groups that had to imagine to be physically active, regardless of the way this activity was described, served themselves more snacks compared to the participants in the control condition.

Koenigstofer, Groeppel-Klein, Kettenbaum and Klicker (2012) examined whether fitness cues on food packages can influence people's food consumption. The study consisted of two experiments. The first experiment aimed to examine if the presence of fitness cues on food packages makes people perceive a larger serving size as more appropriate and if this biased perception increases their food consumption. The second experiment examined whether the presence of exercise cues on food packages increases consumption probability and the actual food consumption without being aware of the serving size. In the first experiment, participants in the experimental group were presented with the package named "fitness trial mix" and participants in the control group were presented with the same package but now named "trial mix". Both groups were given 125 g of trial mix which is usual size of the package bought in a supermarket. Further, they were instructed to read a small description about the product. The description about fitness trial mix included words like "active" and "physically" and the description of trial mix included words like "concentrated" and "mentally". After reading the description participants were asked to give their perception of typical serving size, to eat as much of snack as they wanted and answer several questions. The first experiment shows that participants presented with fitness trial mix ate more and perceived serving size as bigger compared to the participants in a control group. The second experiment followed the same procedure as the first experiment, besides the fact that serving size of trial mix was not revealed. Even though the serving size of trail mix stayed unknown for participants, the results comply with the results from the first experiment and suggest that food consumption is higher for the experimental group compared to the control group and was caused by fitness cues on food package and not influenced by participants' awareness of serving size.

However, there are also studies (Dowray, Swartz, Braxton, Viera, 2012 and Van Kleef, Shimizu, Wansink, 2011) that came with different results and showed that participants in an experimental condition (exposed to exercise cues) consumed less calories compared to a neutral condition.

A study by Van Kleef et al. (2011) aimed to investigate effects of exercise commercials on consumers' food consumption. Participants in the experimental group were watching exercise commercials (e.g. about running shoes or fitness centers) and participants in the control group were watching neutral commercials (e.g. about a pet adoption program). After watching commercials, participants were asked to evaluate them in order to conceal the true purpose of the study. Besides the rating of commercials, participants were given questions related to the mood the commercials evoked in them (feeling happy, guilty, relaxed in a good shape etc.). Additionally, participants were asked to express their likelihood of going to a gym next week. Directly after evaluation, they were asked to process to the food buffet and serve themselves lunch. The food consisted of pasta with tomato sauce, a salad and a chocolate pudding. Results show that participants exposed to exercise commercials ate less calories during lunch compared to the participants in the control group. Particularly overweight participants reduced their food intake in response to the exercise related commercials.

Americans consume a significant amount of their daily calories outside of their homes and this fact gave the base for the study by Dowray et al. (2012) who aimed to understand the effects of a physical activity based food label on peoples' fast food consumption. Participants were randomly assigned into one of the 4 groups. In the first group, participants got a fast food menu with no nutritional information, in the second group participants got menu with information about calories, in the third group participants got information about minutes to walk to burn calories from the item on the menu and in the fourth group participants got information about calories plus miles to walk to burn those calories. Participants were asked to make a hypothetical choice from the menu. Results from this online study indicate that participants in the fourth group, the group with information about calories and miles to burn those calories selected the least caloric fast food menu. Based on this result, the authors concluded that a menu with nutritional information and indicated physical activity is most effective in convincing people to order the least caloric items.

The authors of these studies contributed to some extent to the understanding of how exercise cues influence people's immediate consumption of regular meal and snacks, however as it was shown these studies did not come up with the same results. There might be several explanations why results of these studies have different outcomes. First of all, the way participants were exposed to exercise cues varied considerably. For instance, the study done by van Kleef et al. (2011) used exercise commercials, in which people actually saw people in good shape moving. However, the study of by Albarracin et al. (2009) used exercise posters in one of the conditions. Additionally, in other studies, fitness cues (Koenigstofer et al., 2012) were attached to snack foods or a fast food menu (Dowray et al., 2012). Moreover, Werle and colleagues (2010) did not expose people to pictures, movies or foods, but let people imagine having exercise.

These different types of stimuli may explain the different influence on people's mind and subsequent food consumption. For instance, seeing on a menu how many calories certain dishes contains and seeing how long a person has to engage into a specific physical activity might prevent people from overeating. However, seeing fitness cues on food packages might trigger different inferences about a product in comparison to inferences that physical activity based menu might activate. Physical activity based menu might evoke in a person the amount of effort that has to be put into burning calories from consumed meal and therefore people might refrain from overeating. In essence, increases in amount of snacks consumed are typically explained by the authors as a liberation effect in that fitness is associated with energy expenditure, and higher energy expenditure

means that consumers can eat more to keep a stable or even negative energy balance. Less experience of conflicting goals of indulgence and health may also explain this result in that consumers expected a larger serving size to be appropriate in case a food package contains fitness cues.

Studies vary also in the choice of the food that was offered after experiments took place and that might be another reason for contradictory results. For example, in the study by Werle et al. (2010) participants were offered unhealthy snacks (M&M's and Chex Mix). However in the studies by Koenigstoffer et al. (2012) and Albarracin et al. (2009) participants were offered snacks that are generally perceived as healthy. In the study by van Kleef et al. (2011) participants were asked to serve themselves pasta, salad and dessert which is a complete meal compared to the snacks offered in the previously mentioned studies. Important to note is, that in the study by Dowray et al. (2012) only hypothetical consumption was examined and participants were asked to select from a menu without actually being offered any food afterwards. Even though these studies provide preliminary insights how exercise cues influence people's consumption, the influence of exercise cues on fast food consumption and evaluation remain still unclear.

2.4 Potential underlying mechanisms

We presented several studies that examined the effects of exposure to exercise cues on (hypothetical) food consumption. Some studies showed that exposure to exercise cues and food increase peoples' food consumption, while other studies showed that this connection lead to decreased food consumption. Although the authors of these studies point to potential explanations, the exact mechanisms that lead to certain consumption behaviour are still unclear. Therefore, in this section we present various mechanisms that could explain what is going on in consumers' mind when exposed to exercise cues and food at the same.

2.4.1 Overgeneralization of healthiness of foods due to package claims or cues

Various studies examined the influence of health and nutrition claims on food consumption and find interesting results (Wansink and Chandon, 2006, Chandon, and Wansink, 2007, Andrew, Netemeyer, Burton 1998, Geyskens, Pandelaere, Dewitte and Warlop, 2007). Because the same underlying mechanisms explaining consumers' response to these claims may play a role when consumers are exposed to exercise cues, we here discuss key studies from that field. Similar to nutrition and health claims, exercise-related cues may be associated with health for consumers. Logic behind health claims is in emphasizing of healthiness of one of the product attributes (e.g. high in antioxidants, high in fibre). This emphasis might make people think that an overall product is healthy and thus they are allowed to eat more (Wansink and Chandon, 2006). This is called the health halo effect.

Wansink and Chandon (2006) aimed to investigate the effect of health claims on food consumption and proposed that low fat labels make people overeat. Their hypothesis was tested in three experiments. The study also differentiated consumption of normal- weight and overweight people and consumption of hedonic and utilitarian food. Results of the study support their proposed hypothesis and showed that snack labelled as low fat leads to overconsumption. More precisely, normal weight people tend to overeat utilitarian food labelled as low fat and overweight people tend to overeat food labelled as low fat regardless the function of the food (hedonic or utilitarian).

The study by Chandon and Wansink, (2007) examined people's perception of restaurants that claim to be healthy. Results from four experiments showed that people underestimate calories of burgers and sandwiches if they come from a restaurant claiming to be healthy (Subways) compared to the other restaurant (McDonald's). The same results applied for participants who were little or highly interested in nutrition. Moreover, people who ordered lunch that was positioned as healthy tend to choose side dishes containing more calories. As a result, lunch perceived as healthy might make consumers to order high calories side dish and at the end this increases the total calories intake at a single occasion.

Andrew, Netemeyer, Burton (1998) showed that people tend to overgeneralize some health claims. Results suggests that people who were presented with a commercial that described margarine as "healthy" and "no cholesterol" perceived this margarine as lower in fat compared to the group who was presented with the commercial that described margarine as "delicious eating". Another study by Schuldt and Schwarz (2010) investigated the effect of an "organic" label on cookies consumption. Participants in the study judged organic cookies as less caloric compared to the cookies of the same brand but labelled as conventional cookies. Additionally, the fact that organically labelled cookies make inference that these cookies contain less calories gave participants the permission to eat organic cookies more frequently. Geyskens et al. (2007) examined the effects of the exposure of health claims on chips consumption. The first study suggests that people increased the consumption of chips if these chips are labelled as low fat. However, it was shown that the increased consumption of low fat chips was not caused by participants' perception of low fat chips as healthier. Moreover, when low- fat chips were accompanied with health claims, they were perceived as less healthy compared to the situation when low fat chips were not accompanied with health claims. One of the potential explanations might be that chips are generally viewed as unhealthy food irrespective the way they are presented (regular or low fat) These findings imply that exercise cues may similarly create a health halo effect that the menu or the selected food is perceived to be healthier.

2.4.2 Monitoring of amount of calories consumed

Another potential way in which exercise cues may influence consumption is that they bias people's perception of how much they ate or how much an appropriate amount to eat is. This is typically measured by asking calorie estimations. A study by Dowray (2012) examined peoples' perception of typical serving sizes and concluded that people in experimental group (fitness trial mix) estimated serving size to be larger compared to control group (trial mix). Wansink and Chandon (2006) showed that people in an experimental condition (low fat M&M, low fat granola) perceived appropriate serving size and appropriate consumption amount for themselves larger compared to people in a control condition (regular M&M's and regular granola).

Moreover, several authors showed that people that are confronted with exercise condition (Werle et al., 2010) and health claims condition (Wansink & Chandon, 2006, Schuldt & Schwarz, 2010 and Chandon & Wansink, 2007) underestimated calories content of offered snacks compared to participants in a control condition. Wansink & Chandon (2006) suggested that when people miss nutritional information on packaging, they make inferences about this information "using provided information and their intuitive beliefs'. Based on this assumption we can conclude that people base their calories estimation (missing information) on health halo claim or exercise cues (provided information). Further, when a consumer is deciding how much to eat, he or she can base decisions on the labels that provide information about objective and subjective consumption cues. Objective consumption cues, such as serving size, can inform a consumer what is an appropriate amount of the

particular food to eat on a single occasion. Subjective consumption cues do not provide information about serving size, but about relative nutritional values. Even though, subjective consumption cues do not inform about serving size, they can suggest to consumer what the suitable amount to eat is. Moreover, they might determine the level of the guilt and the pleasure a consumer experiences when eating certain food (Wansink & Chandon, 2006).

2.4.3 Feeling closer to desired fitness level and more active

Based on the discussed studies other mechanisms can be recognized that may provide insights into what is going on in consumers' mind when exposed to exercise cues and food. Two studies came to the conclusion that when food is primed with exercise cues people perceive themselves as more athletic, active and in a good shape (Dowray et al., 2012, Van Kleef et al., 2011). This means that just watching exercise commercials (Van Kleef et al., 2011) without being engaged in any physical activity makes participants to feel more active, athletic and in a good shape. The same applied for participants who were exposed to fitness cues on food packaging; they felt more active regardless the fact that they did not perform any physical activity (Dowray et al., 2012). Moreover, participants who ate "fitness trial" mix felt closer to their desired fitness level compared to the participants who ate "trial mix" (Dowray et al., 2012). The reasoning behind this behaviour might be that fitness cues on food packages may lead to the inference that eating certain food will help people to become fit. Fitness is associated with energy expenditure and that might give people the feeling that they are allowed to eat more food and at the same time keep energy balance (Dowray et al., 2012). Schuldt and Schwarz (2010) agreed with Dowray et al., (2012) and found out that participants who were primed with cookies with health claims felt that they made a step towards their weight loss goal and thus got closer to their desired fitness level. Moreover, participants in health halo claim group expressed more satisfaction with their current weight compared to the participants in a control group who ate conventional cookies (Schuldt & Schwarz 2010).

2.4.4 Justification and consumption guilt

Nowadays, people's eating behaviour is not only driven by attempts to avoid calories deprivation but it is also motivated by pleasure gain. People not only search for the food that fills their stomachs, but also for the food that gives them the feeling of pleasure and comfort. Fast food is the choice for a consumer that achieves two goals at the same time. First, a person avoids calories deprivation when eating a fast food. Second, a fast food delivers a consumer the pleasurable feeling from consumed palatable food (Lowe & Butryn, 2007). However, the choice for a hedonic food may be accompanied by feeling of guilt and irresponsibility (Khan and Dhar, 2004). Although fast food has a palatable taste, it is also high in calories, fats, salt, and sugar. Lowe & Butryn (2007) state that a constant availability and frequent consumption of palatable foods lead to obesity and other serious diseases. Therefore, it is no wonder that consuming hedonic food (such as fast food) may lead to consumers' feelings of guilt. This may be particularly the case when a person's goal is to live a well-balanced healthy life. This goal is important for many people in western societies. However, a person may encounter feelings of goal conflict when exposed to fast food (Luomala, Laaksonen, Leipämaa, 2004). On the one hand, consumers have the urge to indulge into hedonic foods. On the other hand, consumers wish to maintain a certain body weight, stay slim and healthy as well (Belei, Geysskens, Goukens, Ramanathan, Lemmink, 2012). Companies are aware of this goal conflict in consumers' mind and have started to supply the market with so-called healthful indulgences. There are two important characteristics of healthful indulgences. The first one is to give an impression that the food

is healthier than the conventional counterpart on the market. The second characteristic is to give a feeling that consumers can get the pleasure of a regular snack without feeling guilty. This seems a perfect solution for many consumers who want to get superior taste and health benefits at once (Belei et.al. 2012). However, there is an obvious paradox in America's society; at the time that the market of low fat products is increasing (Geyskens, Pandelaere, Dewitte. Warlop, 2007) the prevalence of obesity is rising as well (Hedley et.al, 2004).

When a person hesitates about indulging into hedonic food, he or she is more likely to consume hedonic food when there is a justification for this act. The justification helps to reduce or totally remove a potential feeling of consumption guilt. Oppositely, people are less tempted to consume hedonic food if this act is more difficult to justify. There are two reasons why it is difficult to justify consumption of hedonic food. First, there is always feeling of guilt associated with hedonic consumption, because hedonic goods are not necessary to survive. Second, the benefits from purchase of a hedonic good are more difficult to measure compared to the benefits from purchase of a utilitarian good (Okada, 2005).

Based on the balance theory a person can solve imbalance between the goal to stay healthy and the goal to indulge into hedonic food in three possible ways. First, a person is able to turn his liking of a hedonic food into dislike of a hedonic food. Second, a person reconsiders his first goal and comes to the conclusion that actually health is not that important goal to achieve. Third, a person stops seeing a hedonic food as an unhealthy food (Okada, 2005). Two studies showed that labelling food with low fat (Wansink & Chandon, 2006) or fitness claims (Koenigstofer et al., 2012) reduces peoples' consumption guilt. It means that people changed their opinion about food and stopped seeing a hedonic food as an unhealthy food. Therefore, health claims help people to justify their consumption and at the same time reduce consumption guilt (Wansink & Chandon, 2006 and Koenigstofer et al., 2012).

2.4.5 Taste improvement

Besides feeling active and in shape, participants who watched a set of exercise related commercials perceived a subsequent pasta lunch as more appealing and healthier compared to participants in the control condition (Van Kleef, et al, 2011). Another study showed that a significant majority of people found physical activity based fast food menu more attractive over fast food menu with calorie information or fast food menu with no nutritional information (Dowray et al., 2012). This suggests that consumers change their expectations regarding taste.

2.4.6 Activation of physical activity through fast food exposure

When two stimuli are conceptually or perceptually related, then encountering one makes other stimulus more accessible (Berger and Fitzsimons, 2008). Therefore, once fast food and physical activity became conceptually related, physical activity may become salient in a mind of a person when this person encounters fast food, and the other way around. As it was shown at the beginning of this chapter, food companies are using different strategies to connect a brand with physical activity thus making two stimuli conceptually related. One of the ways how to make brand and physical activity conceptually related is sport sponsorship, relationship between sponsoring brand and sponsored event.

Recent research proved that ‘when a brand becomes linked with an external entity (sport event), some of the attributes and attitudes associations a consumer has towards an external entity may be transferred to associations a consumer has towards a brand’ (Gwinner, 1997). In the context of sponsorship, this concept has been described as “the transfer of associations attributed to the sponsored activity to the sponsoring brand” (Grhos, Wagner and Vsetecka 2004). The ultimate aim of this process is the creation of biases in consumer behaviour. Brand image can therefore be created, enhanced or changed by the establishment of strong and unique brand associations with events or other activities and the subsequent brand image transfer (Gwinner, 1997).

2.4.7 Food choice

Based on the literature review, we concluded that it is difficult to determine which consumption behaviour will be triggered by the exposure to exercise cues and fast food at the same time. We came to this conclusion as results from a variety of studies came with mixed results. Some studies (Dowray, Swartz, Braxton, Viera, 2012 and Van Kleef, Shimizu, Wansink, 2011, Chandon et al., 2007, Schuldt et al., 2010, Geyskens et al., 2007, Wansink et al., 2006) showed that exposure to exercise cues (health claims) and food lead to lower calorie consumption. Other studies (Koenigstofer et al., 2012, Albarracin et al., 2009, Werle et al., 2010) showed that exposure to exercise cues and food lead to higher calorie consumption.

Important to note is that studies that showed increased calorie consumption after being exposed to exercise cues (health claims) examined consumption of snacks, either healthy or unhealthy (raisins Chex Mix and M&M's, trial mix, cookies, chips). The study by Chandon et al. (2007) investigated fast food consumption and came to the conclusion that people tend to overeat food coming from restaurant that claim to be healthy. However, another study (Dowray et al., 2012) concluded that people opt for less caloric fast food if this is labelled with exercise cue, precisely a physical activity that a person has to engage in order to burn the calories from a consumed food.

Van Kleef et al. (2011) concluded that people with higher BMI levels decreased their food intake after watching exercise commercials. Wansink & Chandon (2006) investigated whether people of different weight status respond differently to low fat labels. However, whether peoples’ food choice is influenced by their fitness level has not been examined. Therefore, we explore whether people who are generally physically active respond differently to exercise cues at fast food menu

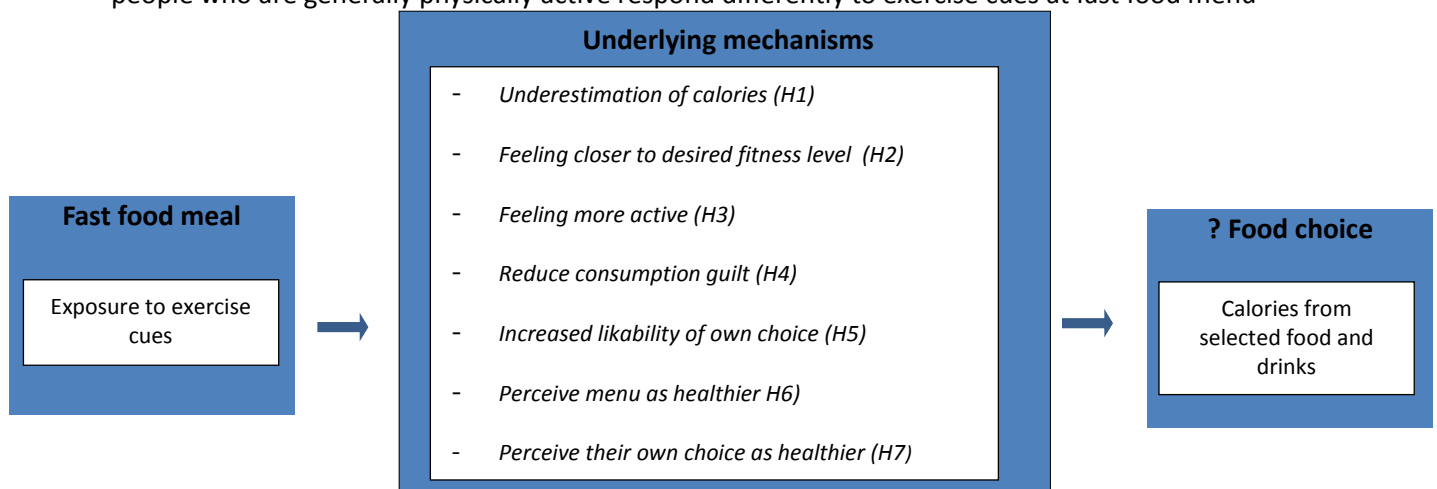


Figure 11. Series of hypotheses

2.5 Summary and hypotheses

Based on the discussed theories we came up with series of hypotheses presented in Figure 11 that may explain what is going on in consumer's mind when exposed to exercise cues and fast food at the same time. As it was mentioned before, previous research has not extensively clarified which behaviours will be triggered by the exposure to exercise cues and fast food. For this reason, no hypothesis is formulated with regard to the number of calories people will select from the manipulated menus.

Based on findings of (Dowray et al. 2012, Wansink & Chandon, 2006, Schuldt & Schwarz, 2010 and Chandon & Wansink, 2007), we suppose that participants in the experimental condition exposed to a fast food menu including exercise cues will underestimate calories from the chosen food and drinks (H1). Moreover, we assume that exercise cues can have the same effects as health claims and therefore make participants perceive a menu labelled with exercise cues as offering healthier options (H6). This would be in correspondence to Dowray et al. (2012), Van Kleef et al. (2011).

Further, we suppose that people exposed to fast food menu including exercise cues see themselves closer to their desired fitness level (H2) and more active (H3). This idea is supported by existing literature and was suggested by authors Dowray et al. (2012), Van Kleef et al. (2011) and Schuldt et al. (2010). Van Kleef et al. (2011) and Dowray et al. (2012) showed that exposure to exercise cues and food increases peoples' liking of a food, therefore we expect participants in an experimental group to like their own food and drinks choice more compared to a control group (H5). Studies by Wansink and Chandon (2006) and Koenigstofer et al. (2012) showed that people tend to decrease their consumption guilt when exposed to exercise cues or low fat labels. Thus, we propose that consumers selecting from fast food menu including exercise cues will decrease their consumption guilt (H4).

Based on the presented conceptual background, we came up with a series of hypotheses presented in a figure 11. Compared to participants being exposed to neutral fast food, participants who are exposed to fast food menu including exercise cues:

- H1: will underestimate calories of selected food and drinks
- H2: will feel closer to their desired fitness level
- H3: will feel more active
- H4: will decrease their consumption guilt
- H5: will increase the likability of their food and drink choice
- H6: will perceive menu as healthier
- H7: will perceive their own choice as healthier

3. Methodology

This study tested our prediction that the presence (vs. absence) of exercise cues on a fast food menu makes participants feel closer to their desired fitness level (H2) and more active (H3). Additionally, we tested if presence (vs. absence) of exercise cues make participants like more their food and drink choice (H5), reduce their consumption guilt (H4) and make them underestimate the calories from their food and drink choice (H1). We also tested whether presence (vs. absence) makes participants perceive an offered fast food menu (H6) and their own choice (H7) as healthier.

3.1 Design and participants

For this study we adopted a between subject design where participants can be either part of the control or the experimental condition. Participants were randomly divided into two groups: the online fast food menu including exercise cues or the neutral online fast food menu. Participants in both groups were asked to make a hypothetical choice from the displayed fast food menu. The fast food menu including exercise cues (Figure 12) was manipulated by adding exercise pictures and naming the online fast food menu “Olympic Week at McDonald’s” to evoke physical activity in consumers’ minds. The online fast food menu for the control condition (Figure 13) was named “Tasty Week at McDonald’s”. The online fast food menu for the control condition contained two pictures of attractive people on the sides. To conceal the real purpose of the study we presented participants with the cover story that informed them about the incorrect aim of the study: to investigate whether people find online fast food menus attractive and whether they would order a fast food from an online ordering website.

Participants in our online study were Dutch students from the Wageningen University and Research Centre in Netherlands and were recruited through a mailing list. Two hundred thirty eight respondents started to fill in the survey. However, 52 respondents did not answer all questions in the survey, 12 respondents did not meet the requirement “to eat at fast food restaurants at least once a year” and 22 participants did not choose any item from the menu. Therefore, they were excluded from the data analysis and this has left us with 152 respondents: 77 in the exercise condition and 75 in the control condition. The majority of participants were women ($n=115$, 75.7 %). At the time of the experiment, 9 participants were on a diet and 143 did not follow any diet. Following the guidelines of World Health Organization (WHO), participants were classified based on their BMI as underweight ($n=9$, 5.9 %), normal weight ($n=124$, 81.6 %), overweight ($n=17$, 11.2 %) and obese ($n=2$, 1.3 %). One participant was randomly selected and received a gift voucher worth 25 euros.

Figure 12. Online menu control condition



Figure 13. Online menu exercise condition



3.2 Procedure

The questionnaire consisted of three parts: a general part (Appendix 2), a part in which participants had to make a hypothetical choice from a displayed fast menu and a final part in which they evaluated the menu, their own selection and filled in several questions about their background (Appendix 3.).

The general part was the same for all participants and included the informed consent and a cover story of the study. Participants were eligible for the study if they eat at fast food restaurant at least once a year. After agreeing with all conditions and stating that they eat at least once a year at fast food restaurants, they were randomly assigned to either exercise condition or control condition using Qualtrics Software.

Participants were asked to have a look at the online fast food menu that was presented to them and answer several questions regarding to the appearance and the authenticity of the online fast food menu. This part was same for all participants and after answering these questions, participants were provided with the description that helped them to imagine the situation in which they were asked to make a food choice: *“Imagine you are at McDonald’s around a lunch time and you are about to order a meal for you. Your budget is unlimited and you want to order a meal that would make you replete. Please select what you would order from the menu below based on the information provided. The menu includes burgers, sandwiches, wraps, salads, chicken nuggets, desserts and drinks. Please keep in mind when selecting fries or certain drinks that you can decide for a small, medium or large size.”* The sample menu was the same for both conditions and consisted of five burgers, two wraps, one chicken nugget, two sandwiches, three salads, five desserts and eight drinks.

After participants selected foods and drinks from the displayed menu, they were shifted to a common part for all participants and instructed to answer several questions related to their consumption guilt they encountered while making a choice from the online fast food menu. Moreover, they were asked several questions to find out how active and how close to their desired fitness level they felt while making a food choice. We also included questions to investigate if participants perceived online fast food menu as offering enough healthy options and if they consider their own food choice a healthy choice. Additionally, we asked them to estimate the amount of calories from the food choice they just made. The questionnaire also contained questions that divided participants into two groups; normal and restricted eaters. After completing this questionnaire, participants were asked to provide basic demographic data (gender, nationality, weight, height). With their weight and height information we were able to calculate their BMI index. They were also asked to write down their e-mail address if they wanted to participate in a lottery. At the end of the questionnaire, we thanked participants for their time they invested into the filling of questionnaire.

3.3 Measures

Calories (dependent variable, H1)

To find out if there is a difference in the amount of calories from hypothetical choice between the control and the exercise group, we looked at the food participants selected and summed up the calories for each condition separately. We calculated the amounts of calories for

both conditions using the table in Appendix 1 with the calories content information we obtained from the website of McDonalds. We also examined if participants in the exercise condition made worse calorie estimation of the hypothetical choice of food and drinks they selected compared to the participants in the control condition. ("How many calories do you think you have just chosen? Please make an estimation"). We expected participants in the exercise condition to make worse calories estimation in comparison with control condition. For this hypothesis a new variable – the accuracy of participants' calorie estimation was created. The accuracy of participants' calorie estimation was calculated by subtracting the amount of calories participants thought they had chosen from the amount of calories they selected.

Feeling active and close to desired fitness level (H2, H3)

In order to measure participants' feeling of being active, we asked them to state their agreement/disagreement with the following statements "I feel like having an active life", "I feel healthy" and "I feel active at this moment" . These statements we adopted and revised from the scale measuring state self-esteem (Heatherton and Polivy, 1991). This scale has relatively low reliability (Cronbach alpha .603) in this study. To assess participants' perception of their ideal fitness level, we asked them to state "How close do you feel to your ideal fitness level" from 0 (far away from desired fitness level) to 100 (desired fitness level fully reached). The same statements and scale to measure how close participants feel to their desired fitness level were used by Koenigstorfer et al., (2012).

Consumption guilt (H4)

To measure participants' consumption guilt we adopted and revised questions from State Shame and Guilt Scale (Marschall, Santfner, Tangney, 1994). Participants were asked to think about how they felt when selecting from the fast food online menu. We asked them to state their level of agreement/disagreement with the following statements: "I feel good about myself, "I feel tense", I feel bad about my food choice", "I feel regret". In order to measure the reliability of the construct "consumption guilt" we reversed rating scale of one variable "I feel good about myself". The statements had to be rated on a five-point Likert scale ("from 1 -"strongly disagree" to 5 - "strongly agree"). This scale had a relatively low reliability (Cronbach alpha .63) in this study.

Likability of own food and drinks choice (H5)

To measure their liking of the selected food we included and revised statements from Likability Scale (Reysen, 2005): "The food and drinks I selected seem tasty", "The food and drinks I selected look attractive", "I am satisfied with my food choice" and "I would make the same food choice next time". Participants were asked to rate the statements using a five-point Likert scale ("from 1 -"strongly disagree" to 5 - "strongly agree"). The scale had an acceptable reliability (Cronbach alpha .72) in this study.

Perceived healthiness of online menu (H6) and own choice (H7)

Additionally, to find out if participants perceived the online fast food menu as offering healthy options we added the statements: "The online fast food menu offers healthy options", "Making a healthy choice is possible from this menu" and "This menu looks really healthy". The scale

had an acceptable reliability (Cronbach alpha .711). Moreover, we also tested if participants perceive their own food and drink hypothetical choice healthier compared to a control condition. To test participants' perceived healthiness of their choice we included statements¹: "I made a healthy choice", "The choice I made can be part of the healthy diet". The scale had a good reliability (Cronbach alpha .87) in this study. The statements for both scales had to be rated on a five-point Likert scale ("from 1 -"strongly disagree" to 5 - "strongly agree").

Restrained eating style

In order to get information about participants' eating behaviour we adopted and revised statements from The three factor Eating Questionnaire (De Lauzon, Romon, Deschamps, Lafay, Borys, Karlsson, Ducimetiere, Charles, 2004). This scale aims to distinguish between normal eaters and restrained eaters. The statements were following: "I deliberately take small helpings as a means of controlling my weight", "I consciously hold back at meals in order not to gain weight", "I do not eat some foods because they make me fat. The scale had an acceptable reliability (Cronbach alpha .77) in this study. Moreover, we asked participants: "Are you currently on a diet?" to divide participants into two groups: participants on a diet, participants not on a diet. They were asked to answer this question by selecting yes or no.

Exercise habits and BMI

To calculate body mass index (BMI) we used the standard formula used by WHO (World Health Organization, 2013). Further, to get more information about our sample, more precisely about weekly exercise behaviour, we used The Godin Leisure – Time Exercise Questionnaire (Godin, G., 1985). Participants were asked to state the type of the physical activity (strenuous, moderate, mild) and the times per week they perform this activity. Weekly leisure time activity score (units) was calculated as following $(9 \times \text{Strenuous}) + (5 \times \text{Moderate}) + (3 \times \text{Mild})$. It was suggested that moderate physical activity does not contribute to any health benefit (Health & Fitness Journal of Canada, 2011), therefore we excluded it from the calculation.

Measure to check whether the cover story was credible

To conceal the real purpose of the study we presented participants with a cover story: *"Increasingly, people decide for home delivered food as an alternative to cooking. Time, convenience and price are just few reasons why people choose for this service. Ordering food at online, for example at a restaurant's website is getting more popular. Therefore the purpose of this study is to find out which type of fast food ordering menu consumer find attractive and convenient to use"* (Appendix 1). We asked participants to state their level of agreement/disagreement using a five-point Likert scale ("from 1 -"strongly disagree" to 5 - "strongly agree") with several statements regarding authenticity, attractiveness, clearness of the online fast food menu. The statements were following: "The online fast food menu looks authentic", "The online fast food menu resembles a real menu", "The online fast food menu looks attractive", "The online fast food menu offers tasty options", "The online fast food menu is clear", "I would order a meal from this fast food online menu". Variables to check whether a menu looks attractive and whether it offers tasty options were not included in the analysis.

3.4 Data analysis

Statistical analyses were done using SPSS Version 19 for Windows. We considered p value < 0.05 for all tests as statistically significant. Analysis of variance (ANOVA) was used to determine if there was a statistically significant difference in the overall mean number of calories selected and desired fitness level between two conditions. Differences between two conditions for categorical variables (gender, diet) were analysed by Chi-Square analysis. Differences between two conditions for continuous variables (BMI, restrained eaters and exercise habits) were analysed by analysis of variance (ANOVA). To investigate whether the exercise condition had an effect on constructs (feeling active, consumption guilt, likeability of own food and drink, perceived healthiness of online menu, perceived healthiness of own choice) we performed analysis of variance (ANOVA).

To find out if the amount of selected calories between two groups differs, we calculated the amount of calories for both groups using the table in Appendix 4 and then compared the amount of calories between two groups.

Finally, to analyse whether participants who exercise more by habit respond differently to the exercise menu than participants who are less used to be physically active, we did a median split on the unit scores from the Godin Leisure – Time Exercise Questionnaire (Godin, 1985). The median score of this index was 34. Participants with scores lower than 34 were included in the less active group and participants with scores above 34 were included in the relatively more active group. After computing, we created a new variable 'exercise habits' with two values: 1 for less active and 2 for more active participants. An analysis of variance which included both menu type and exercise habits as independent variables.

4. Results

4.1 Manipulation check and randomization check

To start data analysis it was important to check whether there was the difference between exercise and control condition regarding the authenticity and clearness of the online menu. We also checked whether there is difference between two groups regarding this variable: “The online fast food menu resembles a real menu”. Results showed there is no significant difference in the perceived authenticity of the online menu between the exercise and the control condition ($F(1,150) = 1.194$, $p = .28$). Neither there was any difference between two conditions in the variable: “The online fast food menu resembles a real menu” ($F(1,150) = .384$, $p = .54$). However, participants in the control condition found the online fast food menu clearer compared to the participants in the experimental condition ($F(1,150) = 5.268$, $p = .023$). The means for variables for control and experimental conditions are presented in Table 1.

Results showed that there is no difference between groups in terms of gender; ($\chi^2(1) = 2.6$, $p = .108$). Also participants on a diet are equally distributed across experimental and control condition ($\chi^2(1) = 1.149$, $p = .284$). Further, we found out there were no significant differences in mean BMI scores ($F(1,150) = 1.141$, $p = .29$), in mean restrained eaters ($F(1,150) = 0.437$, $p = .51$), in exercise habits ($F(1,150) = 0.21$, $p = .65$) across experimental and control condition. The mean BMI of participants was 22.2 ($SD = 3.2$, range 16.8 – 40.4).

Table 1.

Means and SD of variable used for manipulation check

	Control menu (n=75)	Exercise menu (n=77)	P value
'This menu looks authentic'	3.5 (SD=.95)	3.3 (SD=1.1)	.28
Resembles a real menu	3.7 (SD=.94)	3.6 (SD=1.0)	.54
Clear	4.3 (SD=.51)	4.0 (SD=.8)	.02

Notes: SD= Standard Deviation, n=number of participants

**agreement was measured on a 5-point scale*

4.2 Hypothesis testing

Participants selected 333 dishes (the control condition 159 dishes, the exercise condition 174 dishes), 159 drinks (the control condition 89 drinks, the exercise condition 106 drinks) and 79 desserts, (the control condition 36 desserts, the exercise condition 43 desserts). On average, each person selected 3.8 items from the online menu.

The main objective of this study was to examine whether exposure to exercise cues displayed at a fast food menu influence participants' hypothetical choices. In particular, if there is a difference in the amount of calories from hypothetical choice between the control and the experimental condition. Participants hypothetically selected on average 1059 kcal (SD = 502) from the menu (Table 2). Results showed that the effect of exercise condition on the amount of calories from hypothetical choice was not significant, the mean amount of calories did not differ across two conditions ($F, (1,150) = 2,245, p = .14$).

Hypothesis 1 states that participants exposed to the menu including exercise cues will underestimate calories compared to participants exposed to control menu. However, the performed ANOVA showed no significant main effect of experimental condition on estimated calories ($F, (1,150) = 1,802, p = .30$), nor on the accuracy of participants' calorie estimation ($F, (1,150) = 0,276, p = .60$).

Table 2.

Means and SD of selected calories from food and drinks

	Control menu (n=75)	Exercise menu (n=77)	P value
Total kcal of food and drinks selected	997 (SD=487)	1119 (SD=511)	0.14
Estimated calorie estimation	1038 (SD=53)	1117 (SD=52)	0.30
Accuracy of calories estimated	-41 (SD=479)	2 (SD=531)	0.60

Note: SD=Standard Deviation, n= number of participants

The second hypothesis states that participants exposed to the exercise condition will feel closer to their desired fitness level compared to the participants in the control condition. To test the second hypothesis we performed an ANOVA with "menu condition" as an independent variable and "desired fitness level" as a dependent variable. The results showed there is no main significant difference between two conditions regarding desired fitness level ($F, (1,150) = .57, p = .45$). Also, being exposed to the exercise condition did not make participants feeling more active (Hypothesis 3) compared to the control condition ($F, (1,150) = .463, p = .50$). Participants in the exercise condition did also not feel more guilty ($F, (1,150) = .87, p = .35$) and did not like their own choice more ($F, (1,150) = .43, p = .51$) compared to the participants in the control condition (Hypothesis 4 and 5). Hypothesis 6 states that participants in the experimental condition will perceive a menu as healthier compared to the control condition. The performed ANOVA showed no significant difference in perceived healthiness of online menu between two groups ($F, (1,150) = .201, p = .65$). Neither there was any significant difference ($F, (1,150) = .081, p = .78$) between the groups regarding perceived healthiness of own choice (H7). The means for variables for control and experimental conditions are presented in Table 3.

Table 3.
Means and SD of effect of menu on underlying mechanisms

	Control menu (n=75)	Exercise menu (n=77)	P-value
Desired fitness level	61.0 (19.8)	63.3 (18.4)	0.45
Feel active	3.4 (0.7)	3.48 (0.6)	0.50
Feel guilty	2.4 (0.6)	2.34 (0.5)	0.35
Liking own choice	3.9 (0.5)	3.83 (0.5)	0.53
Healthy Menu	2.3 (0.7)	2.38 (0.7)	0.65
Healthy choice	2.4 (1.1)	2.35 (1.0)	0.78

Note: SD=Standard deviation, n = number of participants

4.3 Do participants that are more or less physically active respond differently to the manipulated menus?

We ran an ANOVA with menu conditions (exercise versus control) and exercise habits (less active versus more active) as independent variables and underlying mechanisms – consumption guilt, feeling active and feeling close to desired fitness level as dependent variables. The performed ANOVAs showed there is no significant difference between less active and more active participants regarding selected calories ($F, (1,150) = .005, P = .941$). Similarly, a two-way analysis of variance yielded a non-significant effect of menu conditions (exercise/control) on desired fitness level ($F, (1,150) = 1.02, p = .31$). However, there was a significant effect of exercise habits (less active/more active) on desired fitness level ($F, (1,150) = 5.479, p = .02$). Not surprisingly, less active participants felt further from their desired fitness level ($M = 59, SD = 20.9$) compared to the more active participants ($M = 66, SD = 16.4$). The interaction effect was not significant, $F, (1,150) = 2.44, p = .12$.

An ANOVA showed no significant effect of menu conditions (exercise/control) on a variable feeling active ($F, (1,150) = .681, p = .41$), neither effect of fitness level condition (less active/more active) showed significant effect on feeling active ($F, (1,150) = 2.259, p = .135$). The interaction effect was not significant for feeling active ($F, (1,150), = 1.1761, p = .19$).

The performed ANOVA showed no significant main effect of menu conditions (exercise/control) on consumption guilt ($F, (1,150) = .829, p = .364$). Neither there was any significant effect of exercise habits (less active/more active) on consumption guilt. However, the interaction produced a significant effect on consumption guilt ($F, (1,150) = 7.58, p = .007$). Less active participants in the exercise condition felt less guilty ($M_{\text{exercise-less active}} = 2.3, SD = .4$) compared to the more active participants in the exercise condition ($M_{\text{exercise-more active}} = 2.5, SD = 0.6$) Figure 14.

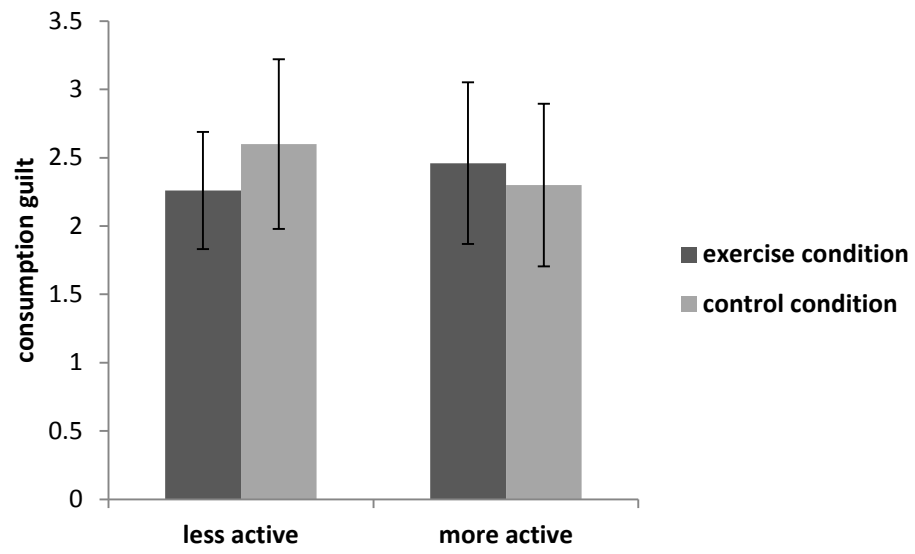


Figure 14. Effects of exercise condition on the consumption guilt for less active and more active participants

5. Discussion

5.1 Reflection on results

In this study we examined whether exposure to exercise cues displayed at a fast food menu influenced participants' hypothetical choices. More specifically, we studied whether there is a difference in the number of calories selected from an 'exercise' menu compared to a neutral control menu. Results showed no difference in the number of selected calories from both types of menus.

We also tested whether participants exposed to the exercise cues underestimated the calories from the chosen food, and felt closer to their desired fitness level, more active, less guilty, like their own choice more and perceived the online menu and their own choice healthier compared to the participants in the control condition. We did not find evidence for any of hypothesis.

The daily recommended calorie intake for a mid-age moderately active female is 2000 kcal and 2200-2400 kcal for a mid-age moderately active male (Zelman, 2008). It is advised to eat on average 665 kcal for a lunch (ACFN, 2013). People in our study selected on average 1059 kcal (SD=502) for a lunch which is considerably more compared to the amount of calories an average dish should contain. Raghunathan et al. (2012) concluded that people overeat food that is considered unhealthy because they are either not aware of the bad consequences, they lack a willpower or they perceive less healthy food as tastier. Fast food is generally perceived as unhealthy which might at the same time evokes tastiness of fast food in peoples' mind. This might be a reason why people in our study selected more calories than an average lunch should contain. Further, this could explain the fact that participants in the exercise condition were not influenced by the exercise cues but by tastiness-unhealthiness of the fast food menu.

Finally, we explored whether people who are in the habit of regularly exercising respond differently to exercise cues on a fast food menu compared to people who are less active in their daily life. More active participants did not respond differently in terms of total number of calories selected, feeling active and desired fitness level. However, results showed that more active participants exposed to the exercise menu felt more guilty compared to the less active participants exposed to the exercise menu. This may be the result of being reminded of exercise and all the health benefits that it has. These health benefits in combination with making an indulgent choice may have led to these feelings of guilt. Another reason that active participants felt more guilty could be that they were reminded how much effort is needed in order to burn the calories from consumed food, especially high in calorie food (van Kleef et al., 2012). We also found a main effect of fitness level condition (less active/more active) on an underlying mechanism – feeling close to desired fitness level. More active participants felt closer to their desired fitness level compared to participants who felt further from their desired fitness level.

Previous studies investigating peoples' consumption after being exposed to exercise cues presented different results. Some studies showed (Werle et al., 2010, Wansink & Chandon, 2006, Schuldt & Schwarz, 2010 and Chandon & Wansink, 2007) that people increased their immediate consumption after being exposed to exercise cues. Other studies (Dowray et al., 2012, Van Kleef et al., 2012, Wansink, 2011) showed that people decreased their consumption after being exposed to exercise cues. The fact that people had to make only a hypothetical choice and their budget was unlimited in this study could lead to an unrealistic food choice situation. Moser, Notaro and Raffaelli (2010) concluded that consumers' behaviour differs in hypothetical and real situations treatment and a price has a bigger influence on consumers' choice when facing a real situation. Providing "money" (in our case unlimited budget) at the beginning of the experiment makes people to spend more money as they would do in a real situation (Moser et al., 2010). Further, ordering fast food

from the online menu – an uncommon way of ordering a fast food could also contribute to an unreal situation. However, it is predicted that in the future consumers will increasingly make use of online order restaurants (Stewart, 2012 and Frey, 2013). Therefore, people could be influenced by these 3 factors: unlimited budget, a hypothetical choice and ordering online and did not react on exercise cues on the online menu. We decided for an unlimited budget because we wanted participants to choose items from the menu they would like to have for a lunch and we did not want to limit them with a set budget.

In both online menus we included attractive people: in the control condition – attractive people and in the exercise condition – attractive people in the movement. This might be the reason why people did not like the exercise condition more as both conditions featured attractive people.

Further, we based our hypothesis: people will like more the exercise online menu on the study of Dowray et al. (2012). People in this study found the most attractive the fast food menu that provided the information about calorie content of the items on the menu and the minutes to walk to burn those calories. The menu that contained no nutritional information and no information about the minutes to walk to burn calories was rated as the least attractive. Obviously, only pictures of attractive people are insufficient in order to make people like the online fast food menu and other exercise cues like calorie content should be used to increase the likeability of a menu.

In two studies (Dowray et al., 2012, Schuldt & Schwarz, 2010) people exposed to exercise cues felt more active and closer to their desired fitness level. In this study, people exposed to exercise cues were more likely reminded that they are not as fit as people on the picture, therefore they did not feel more active and closer to their desired fitness level. People in the exercise condition in the study from Van Kleef et al., (2012) perceived an offered menu as healthier compared to the control condition. However, people were offered a menu that contained pasta dish, a salad and dessert which is in comparison to the fast food menu a healthier lunch option. Fast food is generally perceived as unhealthy food option that is associated with the obesity and other diseases. Even though we included exercise cues in the online menu, peoples' perception of fast food did not change. That might be a reason why they did not perceive the online menu and their own choice healthier despite the added exercise cues.

The failure to find a significant effect of exercise cues on underestimation of calories could be also caused by the peoples' perception of fast food. They might be aware of the high calorie content of fast food and that could lead to higher estimation of calories from the chosen dishes.

Finally, people did not feel guiltier - could be caused by the fact that they had to make a hypothetical choice and not a real choice. As they did not actually consume the food they chosen, their consumption guilt level did not rise.

5.2 Study limitations and recommendations for further research

A first critical aspect of this study is that we did not investigate whether participants were hungry or satiated when filling in the survey. Thus, questions about whether participants are satiate or hungry should be included in future studies. Further, we asked participants to imagine that they are at a fast food restaurant and about to order a lunch but we did not ask them to state the time when they were filling in the survey. As it might be difficult to imagine being at a fast food restaurant and about to order a lunch when a participant for instance just finished a breakfast or was about to eat a dessert, we could obtain biased results. Therefore, future studies should be conducted in a real world situation to examine the effect of exercise cues on real fast food consumption. We would also recommend to set a budget that participants can spend on their fast food meal.

Another limitation of this study is sampling a small amount of university students. Therefore, in future studies we advise to include more participants and not only students to make studies more representative for a general population.

Studies that found an effect of exercise cues on food consumption used either exercise commercials (Albarracin et al., 2009, Van Kleef et al., 2011), a physical activity written description (Werle et al., 2010), fitness cues on food packages (Koenigstofer et al., 2012) or a fast food menu with calories and minutes to burn calories information (Dowray et al., 2012). Therefore, our recommendation for future studies is to use stronger exercise cues than we used - a picture of people in movement in an experimental condition.

Finally, we need to take into account that students at Wageningen University might be familiar with this kind of experiment. Because of this, they could be biased when selecting items from the menu and filling in the survey. To decrease their potential suspicion, we provided them with a cover story of the study.

5.3 Conclusion

This study did not confirm the effect of exercise cues on a hypothetical fast food choice. Neither had we proved the exercise cues effect on underlying mechanisms – mechanisms explaining what might be going on when people are exposed to exercise cues in fast food restaurants. We provided evidence that exercise cues in fast food restaurants might increase consumption guilt of physically active customers. This finding is not in the line with other studies which investigated the effect of exercise cues on food consumption and showed decreased level of consumption guilt after being exposed to exercise cues.

People could already have developed taste preferences for fast food and therefore they are not influenced by any marketing strategy. They might be able to order their favourite fast food without looking at an actual menu. In this case, fast food companies do not have to come up with marketing strategies and they can just rely on peoples' developed taste preferences. However, since linking a fast food company with exercise cues is a common marketing strategy, it looks that these companies have interest in being connected with exercise cues.

Participants were students studying towards a university degree, therefore a certain level of knowledge should be guaranteed. They might be aware of companies' marketing strategies convincing people to buy products and thus less influenced by marketing tricks and more focused on an actual product. However, people who are not aware of these marketing tricks might be easily influenced and react to these strategies in the interest of a company. Therefore, despite the results policy makers should put a question mark on the partnership among companies producing high calorie and low nutrient products and sport events.

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Appendices

Appendix 1. Text of debriefing

Increasingly, people decide for home delivered food as an alternative to cooking. Time, convenience and price are just few reasons why people choose for this service. Ordering food online, for example at a restaurant's website is getting more popular. Therefore the purpose of this study is to find out which type of fast food ordering menu consumer find attractive and convenient to use.

Appendix 2. Questionnaire

Description: A general part for the exercise and control condition

Please indicate the extent to which you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The online fast food menu looks authentic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online fast food menu resembles a real menu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online fast food menu looks attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online fast food menu offers tasty options	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online fast food menu offers healthy options	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The online fast food menu is clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making a healthy choice is possible from this menu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would order a meal from this fast food online menu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This menu looks really healthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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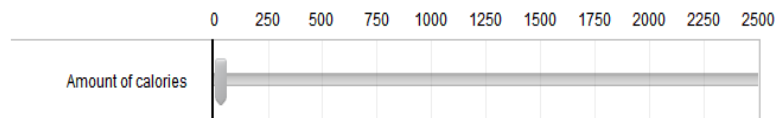
Appendix 3. Questionnaire after a hypothetical fast food choice

Description: Questionnaire after a hypothetical fast food choice including personal data, measuring underlying mechanisms, fitness level and eating habits.

Please, answer the following questions related to your food choice and the feelings you encountered while making a choice from the online fast food menu.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The food and drinks I selected seem tasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food and drinks I selected look attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with my food choice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would make the same food choice next time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I made healthy choices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The choice I made can be part of a healthy diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How many calories do you think you have just chosen? Please, make an estimation.



Please respond to the following statements

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I feel active at this moment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel good about myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel tense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel bad about my food choice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel regret	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like having an active life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel healthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please answer the following questions related to your eating and exercise behaviour.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I deliberately take small helpings as a mean of controlling my weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I consciously hold back at meals in order not to gain weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not eat some foods because they make me fat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are you currently on a diet?

- ☐ Yes
☐ No

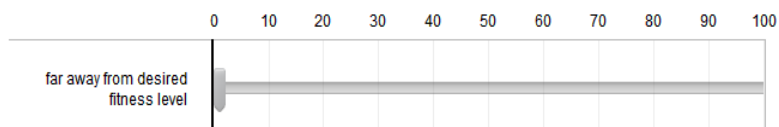
During a typical 7-day period (a week), how many times on the average do you the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

Write down a zero if you do not perform the activity.

	Times per week
Strenuous exercise (heart beats rapidly). For example: running, jogging, hockey, football, soccer, skiing, vigorous swimming or bicycling	<input type="text"/>
Moderate exercise (not exhausting). For example: fast walking, tennis, easy bicycling, volleyball, easy swimming, dancing	<input type="text"/>
Mild exercise (minimal effort). For example: For example: yoga, archery, fishing, bowling, golf, easy walking	<input type="text"/>

How close do you feel to your ideal fitness level?

100 means that your desired fitness level is fully reached.



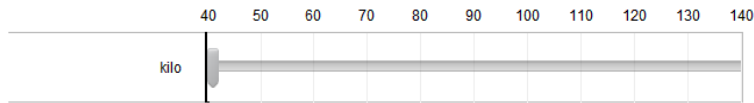
What is your gender?

- ☐ Male
- ☐ Female

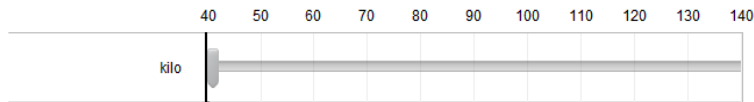
How tall are you?



What is your weight?



What would be your ideal weight?



Appendix 4. Calorie content of the included foods and drinks at the menus, based on information provided at McDonald's website (accessed 25 July 2013).

Product	calories (kcal)
Hamburger	250
Cheeseburger	300
Double-Cheeseburger	600
Fillet-Fish	390
Big Mac	550
Nuggets	190
Chicken-Bacon Wrap (crispy)	620
Chicken-Wrap (crispy)	580
Chicken-Bacon Salad (crispy)	390
Garden-Side Salad	20
Fries Small/Medium/Large	230 / 380 / 500
Apple-Pie	250
Chocolate Muffin	515
Fruit-Bag	46
Ice Cream Cone	170
Coke Small/Medium/Large	140 / 200 / 280
Coke Light Small/Medium/Large	0 / 0 / 0
Fanta Small/Medium/Large	105 / 170 / 210
Coffee Small/Medium/Large	0 / 0 / 0
Cafe Latte Small/Medium/Large	170 / 210 / 280
Water	0
Cafe Frappe Small/Medium/Large	450 / 550 / 670
Smoothie Small/Medium/Large	220 / 270 / 340
Caesar Chicken Salad (crispy)	350