



Which front-of-pack nutrition label is the most efficient one? The results of an eye-tracker study



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ABSTRACT

Different labeling systems that should help consumers make more balanced food decisions have been proposed and are currently in use. In the present study, the effectiveness of three different formats, the nutrition table format, the guideline daily amounts (GDAs) format, and the traffic light (TL) format, was examined. The eye-tracking method was combined with an experimental approach. The participants ($N = 98$) were randomly assigned to one of the three formats, and they were asked to evaluate the healthiness of five foods from different food categories. The eye-tracking data suggest that the participants needed more time to process the GDA format in comparison to the traffic light format and the nutrition table format. Moreover, the participants processed the traffic light format more efficiently than the nutrition table. In regard to information processing, the traffic light format was better than the other two formats. The participants were asked how they perceived the healthiness of the food products. The GDA, the TL and the nutrition table formats did not result in substantially different evaluations of the products. From an information processing perspective, the TL format has advantages over the other two formats. The TL format is a consumer-friendly way of communicating nutrition information.

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Introduction

Food packages contain a lot of information that compete for our attention. The question about how nutrition information should be communicated and designed in order to help consumers make informed decisions has received much attention in recent years (Cowburn & Stockley, 2005; Grunert & Wills, 2007; Hawley et al., 2013; Hieke & Taylor, 2012). Several factors influence the consumers' attention to and understanding of nutritional information. The design of the food package (Visschers, Hess, & Siegrist, 2010), how the nutrition information is presented (Hersey, Wohlgenant, Arsenaault, Kosa, & Muth, 2013), and the consumers' motivation (Bialkova & van Trijp, 2011; Visschers et al., 2010) are among the most important factors that influence the consumers' use of nutrition information. The interest in how to best communicate nutrition information has been stimulated by the fact that, in many countries, consumers' eating habits are not as healthy as they could be. Chronic illnesses, like diabetes, cancer, or heart disease, could be substantially reduced if consumers would adopt a more balanced and healthy diet (Kant, 2004). Nutrition labels and front-of-package (FOP) information are often proposed as instruments that may help

consumers make more healthy food choices (Cowburn & Stockley, 2005). Different labeling systems have been proposed and are currently in use. The use of different non-standardized labeling systems may make it difficult for consumers to evaluate and compare the nutrition value of foods (Hawley et al., 2013).

In the present study, we combined an experimental approach with the eye-tracking method and compared labels communicating guideline daily amounts (GDA) and multiple traffic light (TL) information with the nutrition table. The goal of the present study was to examine how different FOP labels influence participants' efficiency in judging the healthiness of a product and how the FOP labels influence health judgments.

Different FOP labels

The various labels that are used on packaged food to inform consumers about the nutritional value of a product differ in a number of respects (Cowburn & Stockley, 2005; Hawley et al., 2013; Hersey et al., 2013). The non-directive (van Herpen & van Trijp, 2011) nutrition table offers a straightforward approach that informs consumers about the nutrients that are contained in each gram per 100 g of a food product. Semi-directive (van Herpen & van Trijp, 2011) labels help consumers put that information into a context; the GDA label informs consumers about the total number of calories and the amount of sugar, fat, saturated fat, and sodium per portion (Confederation of the Food & Drink Industries

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of the EU, n.y.). Furthermore, the adult guideline amount for the calories and the nutrients contained in the product are presented as percentages. The traffic light signpost labeling proposed by the UK Food Standard Agency lists information about whether a product contains a low, medium, or high percentage of sugar, fat, saturated fat, or salt (Food Standards Agency, 2007). Red, amber, or green color-coding is used to provide information about the level of individual nutrients in the product (i.e., high, medium, or low). The calories are not color-coded. In addition to the color information, the amount of grams per serving for the nutrients is shown. The TL system can be combined with the GDA system.

A number of studies have suggested that FOP schemes may result in a more accurate perception of the healthiness of food products (Borgmeier & Westenhoefer, 2009; Hieke & Wilczynski, 2012; Roberto, Shivaram et al., 2012; Sonnenberg et al., 2013; van Herpen, Seiss, & van Trijp, 2012). A study with German adults found that TL labels resulted in a higher number of correct healthier choices compared with the non-label group (Borgmeier & Westenhoefer, 2009). The GDA label resulted in an average number of correct answers between the TL group and the non-label group. However, the differences in the correct answers between the groups were very small. A study conducted in the UK and the Netherlands found that TL labels and GDA labels increased the consumers' perception of the healthfulness of more healthful products (van Herpen et al., 2012). Only the TL label and the GDA label reduced the healthfulness perception of the less healthful options, however. It needs to be emphasized that the participants in the no-label condition did not receive any information about the product's ingredients.

In order to compare the various labeling schemes, criteria are needed to decide which of the schemes is better. Various studies have examined how well the participants are able to decide which of two or more products is the more healthy choice (Hieke & Wilczynski, 2012; van Herpen & van Trijp, 2011; van Herpen et al., 2012). Some authors concluded that the TL label does not result in substantially better consumer decisions compared to the no-label condition (Borgmeier & Westenhoefer, 2009). In other studies, the TL label condition clearly outperformed the no-label condition (Roberto, Bragg et al., 2012; van Herpen et al., 2012). Other criteria that are relevant for a labeling scheme are whether consumers look at the relevant information and how efficiently the information can be processed. Given the large number of food items we buy, it is crucial that the FOP information can be easily interpreted and processed. The easy interpretation of information does not necessarily mean that such information is taken into account when a decision is made. Very plausibly, information that is difficult to understand may also reduce the probability that people interested in healthy food consider nutrition information when they purchase food.

Eye-tracking studies

In recent years, eye-tracking has been used to evaluate the effectiveness of nutrition labels and nutrition information (Ares, Mawad, Giménez, & Maiche, 2014; Graham, Orquin, & Visschers, 2012; Piqueras-Fiszman, Velasco, Salgado-Montejo, & Charles, 2013). It is obvious that paying attention to the nutrition information does not mean that doing so will result in more healthy food choices. However, it is also clear that consumers need to view the information on the food package before they can use it. The results of eye-tracking studies have suggested that consumers pay less attention to nutrition information as they indicate when are explicitly asked how much attention they pay to this information (Graham & Jeffery, 2011). Eye-tracking seems to be a promising method to better understand how consumers process the information on various labels (Bialkova & van Trijp, 2011).

In a study by Jones and Richardson (2007), a standard nutrition table was compared with a nutrition table that contained TL information. Based on the eye-tracking data, the authors concluded that TL information helps guide people's attention to the most appropriate areas of the nutrition label. In this study, the participants were not informed about the product; they only saw the nutrition information. This is a weakness of the study because consumers have some prior knowledge about food products. Their nutrition knowledge may be limited (Dickson-Spillmann, Siegrist, & Keller, 2011), but it influences their viewing behavior. This assumption is supported by Graham and Jeffery (2012) who found that participants paid more attention to the nutrition information of foods that are more processed in comparison to foods that are less processed. Consequently, the expectations about the nutritional value of food seem to influence what type of information the people pay attention to.

The most comprehensive eye-tracking study was conducted by van Herpen and van Trijp (2011). In this experimental study, three labeling schemes were compared: the Health Tick checkmark logo, the nutrition table, and TL labels. In the nutrition table condition, the participants received information about how many grams of sugar, fat, saturated fat, and salt were contained in 100 g of the product. In the TL label condition, only the color-coding of the four ingredients was shown. In the Health Tick condition, the products either had a checkmark (tick) or they did not, but no additional information about the nutritional value of the product was provided. The participants were shown six different cereal boxes that were displayed on a screen and they had to select one of the boxes. In one condition, the participants had to select the preferred box; in the other condition, they were asked to also take the healthiness of the product into account when making a decision. The eye-tracking data suggest that the likelihood that the nutrition information is paid attention to is highest for the boxes that contained the Healthy Tick logo and for the condition in which the participants were asked to choose a healthy product. Furthermore, the presence of the Healthy Tick logo and the TL information resulted in more healthy choices compared with the nutrition table. The authors concluded that consumers need directive information provided by either the Healthy Tick logo or the TL label, even though consumers find the nutrition table appealing. However, this conclusion can be challenged. The participants in the nutrition table condition received additional, numerical information about the ingredients, but the participants in the Healthy Tick and the TL conditions did not. It could well be that consumers in the nutrition table condition found the differences in the ingredients too small for them to be willing to sacrifice taste. In the Healthy Tick and TL conditions, it remained unclear to the participants how much the products differed in regard to the ingredients. Therefore, an alternative explanation of the findings could be that the participants were misled by the Healthy Tick logo and the TL label.

Aims of the present study

Several criteria can be used to evaluate an FOP label. A criterion used in some previous studies is whether FOP labels help consumers to better distinguish healthy food from less healthy ones (e.g., van Herpen & van Trijp, 2011). We refer to this as the effectiveness of a label. Another important criterion of an FOP label is how fast it allows consumers to extract the relevant information and whether consumers pay attention to all relevant pieces of information. We refer to this as the efficiency of a label. The main aim of the present study was to examine the efficiency of three different formats, namely, nutrition table, GDA, and TL, in communicating nutritional information to consumers. We combined the eye-tracker method with an experimental study.

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