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Comparative performance of three interpretative front-of-pack nutrition labelling schemes: Insights for policy making

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ABSTRACT

Different interpretative front-of-pack (FOP) nutrition labelling schemes have recently been implemented in several countries but it is still unclear which is the most effective. The present work compared three interpretative schemes (Nutri-score, health star rating and nutritional warnings) in terms of attentional capture, processing time, influence on perceived healthfulness and purchase intention of products with different nutritional profile. Two studies were conducted. In the first study, attention to and processing time for interpretation of FOP labels was evaluated using a visual search task with 112 participants. In the second study, an online survey with 892 participants was conducted to evaluate the influence of interpretive FOP labels on purchase intention and perceived healthfulness of a series of products. A between-subjects design was implemented to compare a control condition (without front-of-pack nutrition information) and the three interpretive FOP schemes. The health star rating was found to perform worse than the other two schemes in terms of capturing attention and altering perceived healthfulness and purchase intention. The latter effect depended on the degree of healthfulness of the food products in question, but the effect on consumer behaviour towards unhealthful product categories was more pronounced for the warning label scheme. From a nutrition policy effectiveness point of view, results suggest that nutritional warnings may have advantages over Nutri-score and the health star rating in the context of the current food environment, characterized by the wide availability of products with high content of nutrients associated with non-communicable diseases.

1. Introduction

The current food environment is characterized by the wide availability of nutrient-poor, calorie dense foods, which are usually inexpensive and are intensively promoted (Popkin, Adair, & Ng, 2012; Stanton, 2015; Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). In this situation, unhealthy foods are likely the default option for consumers, given they need to invest relatively more time, effort and money to eat healthily (Hawkes et al., 2015; Thaler & Sunstein, 2008). For this reason, a reduction in obesity prevalence at the population level is unlikely to occur until the environmental influences on eating behaviour are tackled (Swinburn, Egger, & Raza, 1999).

Creating supportive food environments that encourage people to eat healthily has been recognized as the top priority for policy making (Hawkes et al., 2015). These policies are more cost-effective and can

have a more lasting effect on behaviour change than individual approaches to obesity (Capacci et al., 2012; Swinburn, Egger, & Raza, 1999). Several policy actions targeted at modifying the food environment have been suggested, including changes in the availability of healthy foods, targeted subsidies and taxes, improving the quality of the food supply, restrictions on advertising, and imposing nutrition labelling standards (Hawkes, Jewell, & Allen, 2013).

1.1. Nutrition labelling

Nutrition labelling informs consumers of the nutritional properties of food products through two components: nutrient declaration (i.e., detailed qualitative information about nutrient content, such as nutrition facts panels) and supplementary nutrition information, which intends to assist consumers to understand the nutritional value of foods

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(Codex Alimentarius, 2017).

Considering that people usually find it difficult to make sense of numerical information (Paulos, 1988; Peters et al., 2006), simple graphical information has been reported to be more efficient in influencing risk perception and behavioural intention (Peters, Dieckmann, Dixon, Hibbard, & Mertz, 2007; Fagerlin, Wang & Ubel, 2005). For this reason, front-of-package (FOP) nutrition labelling schemes have been devised in order to communicate supplementary information via simple graphical information (EUFIC, 2017).

FOP nutrition labelling is not an intrusive policy and is usually well accepted by both consumers and the industry (Mazzocchi et al., 2015). In addition, FOP nutrition labelling is not a mere informational measure, as it can be regarded to serve as a 'nudge' in the choice situation due to its simplicity and salience (Reisch & Sunstein, 2016), meaning that it can potentially have a stronger effect on consumer behaviour in the store than conventional nutritional information.

1.2. Interpretive front-of-pack (FOP) nutrition labelling

The various FOP nutrition labelling schemes developed worldwide differ in the extent to which they assist consumers to evaluate product healthfulness (Hodgkins et al., 2012). Directive or interpretive schemes provide cues about product healthfulness, which can either be based on specific nutrients or on the overall product (van Kleef & Dagevos, 2015). Directive or interpretive schemes have been reported to be more efficient in assisting consumers to accurately evaluate product healthfulness and to encourage healthy food choices than other popular schemes, such as the guideline daily amounts (GDA) or the traffic-light system (Arrúa, Curutchet et al., 2017; Arrúa, Machín et al., 2017; Ducrot et al., 2016; Julia et al., 2016; Mhurchu et al., 2017).

Different variants of interpretive schemes have been recently implemented in several countries (EUFIC, 2017). These largely differ in the type of information they include, their graphic representation and the underlying nutrient profiling method used to rank product healthfulness based on nutrition composition. It is still unclear which of the interpretive FOP label schemes currently discussed is most effective.

Three interpretative schemes have been recently implemented in countries of different world regions and constitute examples of approaches that differ in their underlying rationale and design: the French Nutri-score (Ministère de l'Agriculture et de l'Alimentation, 2017), the Australian health-star rating (Commonwealth of Australia, 2016) and the Chilean warning system (Ministerio de Salud, 2015).

Nutri-score and the Australian health-star rating system are voluntary FOP nutrition labelling schemes that provide a global overview of product healthfulness. This global assessment is based on the product's content of nutrients associated with increasing the risk factors for non-communicable diseases (energy, sugars, saturated fats and sodium), as well as the product's content of 'positive' nutritional aspects (fibre, proteins, and the content of fruits and vegetables) (Commonwealth of Australia, 2016; Ministère de l'Agriculture et de l'Alimentation, 2017). Nutri-score classifies products into 5 categories of nutritional quality, each associated with a different colour and letter: green for the highest nutritional quality (A) and red for the lowest nutritional quality (E) (Ministère de l'Agriculture et de l'Alimentation, 2017) (Fig. 1a). Meanwhile, the Australian health-star rating classifies products into 10 categories of nutritional quality, using the star rating exclusively, which ranges from 0.5 stars (least healthful) to 5 (most healthful) (Commonwealth of Australia, 2016) (Fig. 1b). The main differences between the two systems are found in their graphical representation – as described above – and the type of comparisons among products they enable: Nutri-score aims at assisting consumers to evaluate product healthfulness *across* food categories, whereas the health-star rating system mainly enables consumers to discriminate between foods within the same category, as it establishes some category-specific criteria.

The Chilean warning system, on the other hand, is a nutrient-based scheme, which highlights products with high content of nutrients associated with non-communicable diseases (calories, sugars, saturated fat and sodium) (Corvalán, Reyes, Garmendia & Uauy, 2013). This scheme is compulsory and products should include separate black octagonal signs for each nutrient that exceeds pre-established criteria (Ministerio de Salud, 2015). The warning system is currently under consideration in various Latin American countries including Uruguay, where the Nutrient profile model of the Pan American Health Organization (2016) is used for defining excessive content of nutrients associated with non-communicable diseases (sugars, fat, saturated fat and sodium) (Ministerio de Industria Energía y Minería, 2017). The graphical representation of the warnings in the Uruguayan proposal is shown in Fig. 1c.

Although there is general agreement on the need to provide simple nutrition information to empower consumers to make more informed purchase decisions, consensus on what interpretational elements are the most appropriate to encourage consumers to make more healthful choices and improve the health status of the population is still lacking (EUFIC, 2017). Therefore, experimental evidence on the relative effectiveness of different FOP schemes is crucially important for policy makers considering the adoption of this public policy.

1.3. Effectiveness of FOP nutrition labelling

The effectiveness of FOP nutrition labelling schemes is determined by their ability to encourage more healthful dietary patterns (EUFIC, 2017). To be able to do so, various steps need to be influenced by the FOP label, and this poses a number of requirements to the FOP label. First, FOP nutrition labelling schemes need to catch consumers' attention (Grunert & Wills, 2007). Considering that most in-store purchase decisions are habitual choices (van't Riet, Sijtsema, Dagevos, & De Bruijn, 2011), FOP nutrition labelling schemes need to rapidly catch consumers' attention in order to disrupt habitual choice routines. The easier it is to notice FOP labels, the more likely consumers are to notice them and, consequently, to take them into account in their decision making process (Bialkova & van Trijp, 2010, 2011).

After FOP labels are attended to, the information they convey should be efficiently processed (Grunert & Wills, 2007). Consumers cannot be expected to invest large cognitive resources to analyzing nutrition information as they usually invest little cognitive effort in making the great majority of their in-store food choices (Frewer & van Trijp, 2007). FOP labels should facilitate understanding of nutrition information and increase the speed with which product assessments can be performed (Pettigrew, Talati, Miller, Dixon, & Ball, 2017), as indicated by shorter processing time.

Changes in consumers' food choices are only expected to occur if FOP labels modify healthfulness perception. It can be hypothesized that by making information about product unhealthfulness more salient, FOP labels may be able to influence consumer beliefs and behaviour and discourage consumption of unhealthful products (Entman, 1993; Dar-Nimrod & Heine, 2011). In this sense, the information included on FOP labels has been reported to modify consumers' healthfulness perception and purchase intention, in particular for those products that are wrongfully perceived as healthful (Arrúa et al., 2017; Lima, Ares, & Deliza, 2018; Machín et al., 2017; Maubach & Hoek, 2008).

1.4. Research objectives

The aim of the present work was to compare three interpretive front-of-pack nutrition labelling schemes (Nutri-score, health star rating and nutritional warnings) in terms of attentional capture, processing time, influence on perceived healthfulness and purchase intention of products with different nutritional profile. More concretely, FOP label schemes were compared in terms of: i) time needed for consumers to identify the label on packages (Study 1), ii) time needed for consumers to classify products as healthful/unhealthful based on the information provided on the labels (Study 1), iii) influence on healthfulness