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Standing out in the crowd: The effect of information clutter on consumer attention for front-of-pack nutrition labels

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ABSTRACT

Whether and how information density on front-of-pack design affects consumers' attention for nutrition labels is explored. The main manipulation concerned the number and type of nutrition labels (directive-, semi-, and non-directive), chromaticity (monochrome vs. traffic light color-coded scheme); number and type of additional design elements; and the distance between the label and additional design elements. Attention was measured by performance in visual search task. Performance was slower with increasing number of additional design elements, and when the label appeared in a dense rather than non-dense area. These effects were modulated by label type and chromaticity. The results show that information density is a key factor for consumer attention to (nutrition) information. Implications for policy makers and food producers who want to optimize package design layout and thus help consumers easily to find nutrition information displayed front of the pack are discussed.

Introduction

Policy makers aiming to stimulate the informed healthful choice are faced with an important challenge to design and implement nutrition information labels that would attract consumer attention and be used in their food choices. This is far from a trivial task, as research shows that nutrition labels on foods may often receive only limited attention (Drichoutis et al., 2006; Rawson et al., 2008) and consideration in food choices (Drichoutis et al., 2006; Grunert and Wills, 2007; Grunert et al., 2010a; Möser et al., 2010), and even if attended they may confuse consumers in drawing appropriate health inferences (e.g., Hooker and Teratanavat, 2008; Kapsak et al., 2008; Urala et al., 2003).

Therefore, consideration at the European Commission level has been given to the development of a standardized system of front-of-pack nutrition labeling that would attract consumer's attention and provide relevant information for executing healthful choice (European Parliament, 2007). This has generated increased interest in consumer behavior research regarding front-of-pack (FOP) nutrition labeling, as for example within the EU-funded FLABEL project (www.flabel.org). Such research confirms that front-of-pack nutrition information is widely available across Europe (Storcksdieck et al., 2010), that it occurs in different formats (Hodgkins et al., 2012), and that consumers generally spend limited amount of time in inspecting nutrition information at the point of sale (Grunert et al., 2010b). Although there are profound differences between European countries (Storcksdieck et al., 2010), a general concern emerging from this line of research is whether consumers notice and use the nutrition information in their final food choice decisions. Traditional approaches for measuring nutrition label use, adopting self-report measures (e.g., Cowburn and Stokley, 2005; Higginson et al., 2002; Kelly et al., 2009) in surveys and questionnaires (Roberto et al., 2012; Steenhuis et al., 2010; Vyth et al., 2012), provide only limited insight on whether and how nutrition labels influence consumers attention and choice. These approaches assume a level of awareness in the processing of nutrition information and a level of introspection in reporting information processing and use of nutrition information that may not be realistic (van Trijp, 2009). This observation has stimulated methodological innovation in the study of attention and information processing (Bialkova and van Trijp, 2011), including approaches based on the visual search methodology (e.g., Bialkova and van Trijp, 2010) and eye-tracking measurements (for an overview see Graham et al., 2012). These studies implement methodologies well established and widely used in psychology for capturing attention (e.g., Bundesen, 1990; Duncan and Humphreys, 1989; Treisman and Gelade, 1980; Rayner, 1998, 2009), and show that consumers' attention to nutrition labels is affected by the way in which the label is presented on the packages.

Whereas previous studies have largely focused on how features of the nutrition label itself (such as label type, its size, and its

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chromaticity) affect attention and use of the label, an issue that has received limited attention so far has been the context in which the label occurs on the package, and the interplay between the label and its context. The context (i.e., other design elements displayed on the front of the pack) can potentially be a major determinant of consumer attention to nutrition labels. Bialkova and van Trijp (2009, 2010) already showed that consumer attention to nutrition labels is enhanced when the nutrition information is made more salient within the visual field (i.e. the product packaging). This holds for the size and the color scheme of the label, and also the consistency of where the label appears on the front of the pack enhances consumer attention to the label. However, it is obvious that this is only one element of the packaging context which can influence consumer attention to labels (Bialkova and van Trijp, 2011). Additional design elements may play a role in processing, but a systematic research on this issue is missing.

The current study addresses this question by exploring the role of information clutter in consumers' attention to front-of-pack labels. Addressing this issue could have a huge impact for optimizing package design and help consumers making well informed healthful choices.

Theoretical background and hypotheses

The number and variability of the design elements on the front of the pack (so called information cues in a visual scene) is usually described by the term "clutter" (e.g., Bravo and Farid, 2004; Rosenholtz et al., 2007). Visual clutter is characterized by a number of factors, such as set size (i.e. the amount of information cues), similarity between information cues (i.e. congruent vs. incongruent information), spatial proximity (i.e. distance between information cues), and background complexity (for an overview see Beck et al., 2010).

The present study elaborates on the above characteristics, and in the context of product packaging design explores clutter in terms of three dimensions, namely (a) set size as a measure of the total number of information cues on the packaging, (b) proximity of information cues as a measure of spatial layout, and (c) congruency of information cues as a measure of target – distractor (i.e. label – additional design elements) similarity. These three dimensions will be the independent factors in our experimental design examining attention. The hypothetical effects on these factors are described below.

Set-size effect

The number of items in the visual scene accounts for variance in detecting particular target item as shown in visual search paradigm (e.g., Eriksen and Schultz, 1979; Estes and Taylor, 1964; Sperling et al., 1971; Treisman and Gelade, 1980). It is easier to find a target in an uncluttered as compared to a busy area (e.g., Duncan and Humphreys, 1989; Treisman and Gelade, 1980; Wolf, 1998), and to find two targets rather than one single target (Korner and Gilchrist, 2008).

Translating these facts into the context of nutrition labeling, we predict a label will attract consumers' attention better and thus would be find easier with doubled set size, i.e. two labels combined rather than a single label presentation front of the pack. Combination of nutrition labels is not uncommon; often, key-nutrient based information like Guideline Daily Amounts (GDAs) is combined with the possible presence of a health logo, like the Nordic Keyhole (on the Scandinavian market) or the Choices logo (on the Dutch Market).

Therefore, we hypothesize:

H1. Increasing the set size of the nutrition labels leads to increased attention to those labels. Attention is enhanced when the nutrition label is a combined (GDAs and health logo) rather than an individual nutrition label (either GDAs or health logo).

Further, we assume that information cues in addition to the nutrition label (e.g., health claims) on the front of the pack compete for consumer attention and will therefore act as distracters with regard to the nutrition label. Previous studies on nutrition labeling have largely ignored this competitive clutter and typically explored the attention process for nutrition labels against a background that is kept constant in terms of its amount of information. However, psychological research exploring attention when the background changed reported reduced attention capture with increasing number of elements in the visual scene, reflecting longer time for finding the searched item (e.g., Duncan and Humphreys, 1989; Treisman and Gelade, 1980; Wolf, 1998). Applying this finding to the nutrition labeling context, we expect:

H2. Increasing the number of additional design elements on the packaging reduces attention to the nutrition label.

Proximity effect

The spatial distribution of information within the visual scene (Downing, 1988; Laberge and Brown, 1989) and the proximity of different information cues (Hoffman and Nelson, 1981; Kramer et al., 1985) influence attention to the information. More precisely, it was shown that spotting any particular information cue is more difficult with smaller distances between this cue and the other stimuli in the visual scene (Eriksen and Eriksen, 1974; Pelli and Tillman, 2008), and if the cue is present within a dense area, e.g. surrounded with a lot of additional elements (Eriksen and Hoffman, 1972, 1973; Hoffman and Nelson, 1981). We assume that proximity of the nutrition label to other design elements (i.e. potentially distracting information) on the front of the pack, will affect the way the nutrition label attracts consumer attention. More precisely, we predict:

H3. Attention to the nutrition label is enhanced when this label appears in a low rather than in a high information dense area.

Congruency of information

Congruency of information (i.e., target–distractor similarity) is another dimension that has been found to affect attention (e.g., Eriksen and Hoffman, 1972; Miller, 1991; Hommel, 2003). The target and distractor are congruent when both have similar features, e.g., same color, shape (Eriksen and Eriksen, 1974; Theeuwes, 1996), or same semantic category (Shaffer and Laberge, 1979), and respectively incongruent when these features differ. The typical finding in visual search experiments is for facilitation of performance with congruent and impairment with incongruent information cues (e.g., Eriksen and Eriksen, 1974; Theeuwes et al., 2000, 2001). In the context of nutrition labels appearing against the background of a packaging design containing congruent or incongruent information cues, we assume that, if the additional design elements are congruent to the nutrition label (e.g., a GDA label contains information about the fat level, and a health claim states " reduced fat"), this will facilitate attention capture to the nutrition label. By contrast, incongruent information (e.g., a GDA label contains information about the fat level, and a health claim states "fiber plus") on the background packaging design will reduce attention to the nutrition label. Therefore, we hypothesize: