

# Influence of Label Design on Children's Perception of 2 Snack Foods

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## ABSTRACT

**Objective:** To evaluate the influence of label design on children's perception of 2 popular snack foods across 3 income levels.

**Design:** Labels of 2 snack products (yogurt and sponge cake) were designed using a fractional factorial design with 3 2-level variables: cartoon character, nutrition claims, and front-of-package nutritional information.

**Participants:** A total of 221 children (aged 9–13 years) from Montevideo, Uruguay, with different income levels, participated in the study.

**Main Outcome Measures:** Children's attitude toward and liking of 2 food products.

**Results:** Low-income children showed a more positive attitude toward the products than did middle- and high-income children. The inclusion of a cartoon character in sponge cake labels significantly affected hedonic expectations regardless of income. Middle- and high-income children tended to use the term funny more frequently and the term boring less frequently to describe labels that included the cartoon character, compared with those that did not.

**Conclusions and Implications:** Results showed that the inclusion of cartoon characters on food labels is associated with fun. Low-income children seem more susceptible to the marketing strategies of food companies than do middle- and high-income children.

**Key Words:** nutrition labeling, income, front-of-package, traffic light system (*J Nutr Educ Behav.* 2016; ■:1-7.)

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## INTRODUCTION

Childhood overweight and obesity have increased and have become one of the main public health problems worldwide.<sup>1-3</sup> The food environment of industrialized countries, characterized by the availability of food rich in calories, sugar, and saturated fat, has been identified as one of the

causes of the increased prevalence of childhood obesity.<sup>4</sup> For this reason, changes in the food environment have been deemed necessary to prevent and reduce childhood obesity.<sup>5</sup>

The food industry uses several marketing strategies to advertise their products to children in an attempt to generate positive associations about the products' hedonic, emotional, and

social characteristics, as well as to create brand loyalty.<sup>6-8</sup> These strategies have been reported to influence children's preferences and dietary patterns negatively by increasing liking, wanting, and purchase requests of soft drinks, breakfast cereals, sweets, confectionery, cookies, chocolate, and other food products with low nutritional quality.<sup>7-10</sup> Restrictions on advertising of unhealthful foods to children have been implemented in different countries in an attempt to prevent its effects on children's food choices.<sup>3,11</sup> However, regulation of advertising usually does not consider all marketing strategies commonly used by food companies, specifically package design and promotions.<sup>11,12</sup>

The role of package design as a key strategy in the marketing of food products targeted at children markedly increased in the past decade.<sup>13</sup> Food companies design packages to attract children's attention, to communicate information about their products and to convey expectations.<sup>14</sup> Some of

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the most frequent strategies considered in the design of food packages targeted at children include the use of bright colors; the inclusion of cartoon characters; references to fun; and ties-ins with movies, television programs, and sports.<sup>14-16</sup> In addition, nutrition claims are frequently included on the front of packages of products, even though they contain high fat, sugar, or sodium content.<sup>17,18</sup> These strategies encourage children to think that products are healthful,<sup>19</sup> tastier,<sup>20-23</sup> more fun,<sup>19</sup> and more appropriate for them<sup>19</sup>; and have been reported to increase children's liking and willingness to consume them.<sup>19-23</sup> Given the importance of packaging on children's perception of food products, regulation of package design was identified by several researchers and organizations as a possible strategy that can discourage consumption of industrialized unhealthy products.<sup>10,11</sup>

Packaging can also be used to encourage healthful food choices through the inclusion of nutritional information.<sup>24</sup> However, although school-aged children have been reported to consider specific nutrients (sugar, salt, fat, and calories) to evaluate food healthfulness, they do not frequently read the nutritional information included on food labels because they consider it confusing.<sup>25-28</sup> In this sense, the development of simplified directive or semidirective nutritional information schemes, such as the traffic light system or warnings, can improve children's understanding of nutritional information through the inclusion of signs that indicate a high level of key nutrients (usually sugar, fat, and salt).<sup>29</sup> These schemes could be used by children to identify unhealthy products and could potentially contribute to counteract the negative effects of marketing strategies. Although there has been little research on the topic, some studies have shown that the traffic light system and emo-labels (which use smiley faces) positively influenced children's healthfulness perception and food choices.<sup>30,31</sup>

Food-related consumer behavior cannot be fully understood without taking into account individual characteristics.<sup>32</sup> Income has been reported to strongly influence how people perceive and select food, which in turn rein-

forces belonging to a specific social class.<sup>33,34</sup> Consumption of specific products can be regarded as an expression of social status and identity.<sup>35</sup> Several authors<sup>36,37</sup> reported differences in the food choices and dietary patterns of low- and middle-/high-income children. However, this sociodemographic variable was not been considered in most studies evaluating the influence of label design on children's perception of food products.

The aim of the current work was to evaluate the influence of label design on children's perception of 2 popular snack foods (yogurt and sponge cake) across 3 income levels.

## METHODS

### Participants

A total of 221 children in grades 3–6 from 3 primary schools in Montevideo, Uruguay, participated in the study. The sample size was determined considering the recommended number of participants in hedonic tests involving small differences among products and the usual number of participants included in studies involving the conjoint analysis methodology. A convenience sampling of primary schools was used to select 3 schools located in different neighborhoods in Montevideo that clearly represented 3 different socioeconomic levels: low, middle, and high income.<sup>38</sup> These socioeconomic levels are usually estimated based on the average daily income of the members of the household as follows: low income (<\$8 US), middle-income (between \$20 US and \$50 US), and high income (>\$50 US).<sup>39</sup> In the current study, neighborhoods with an average daily income between \$8 US and \$20 US, corresponding to low-/middle-income level, were not considered. The researchers estimated children's socioeconomic level considering the socioeconomic level indicators of the neighborhoods in which the schools were located.<sup>38</sup> The directors of the schools were contacted and information about the project and the specific aim of the study was provided. Written informed consent from children and their parents was obtained before the study. No specific information about the objective of the study was

given to children and their parents before the study. Instead, it was explained that they would have to evaluate a series of food labels. No compensation was given to participants. The Ethics Committee of the School of Chemistry of Universidad de la República, Uruguay approved the experimental protocol. The study was conducted in September to November, 2014.

### Experimental Design

Two snack products were chosen for the study: yogurt and sponge cake. Products were selected for their popularity among children, as well as availability of commercial products in the Uruguayan marketplace. Labels of each product were designed using 3 2-level variables: cartoon character (present vs absent), nutrition claim (present vs absent), and front-of-package nutritional information (Guideline Daily Amount system vs traffic light system). Unfamiliar cartoon characters similar to those included in commercial products were used: a dinosaur on the yogurt labels and a bear on the sponge cake labels. Nutrient claims were different for each product: calcium plus vitamin D and enriched with iron and folic acid for yogurt and sponge cake labels, respectively. Regarding front-of-package nutritional information, the Guideline Daily Amount system<sup>29</sup> was considered a baseline condition because it is already being used by food companies in Uruguay. The traffic light system was considered the alternative option because it was one of the most studied schemes and has been reported to be the easiest to understand under experimental conditions.<sup>24</sup>

For each product, a total of 4 labels were designed following a half-fractional factorial design. Table 1 shows the characteristics of each of the labels considered in the study in terms of the design variables of the conjoint analysis. All labels were designed using the GNU Image Manipulation Program (GIMP 2.8; The GIMP Team, [www.gimp.org](http://www.gimp.org), 2014) and did not correspond to commercial products available on the Uruguayan market, to prevent the influence of previous experiences with products on children's perception of the labels. All

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