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Short Communication

Promoting healthy drink choices at school by means of assortment changes and traffic light coding: A field study

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ABSTRACT

Although there is widespread agreement about the need to reduce teenagers' consumption of sugar-sweetened beverages, banning these drinks from the school environment is not always feasible. In this paper, we tested whether increasing the assortment of healthier alternatives and clearly labelling them as healthy by means of traffic light coding qualifies as an alternative approach to reduce the consumption of sugar-sweetened beverages at school. In a field study, we tripled the assortment of healthy ('green') and relatively healthy ('amber') drinks and kept the assortment of sugar-sweetened ('red') drinks constant during five intervention weeks in two treatment Belgian schools. Compared to baseline and to an untreated control school, we found that the relative market share of red beverages dropped by more than 30 percentage points. In one school, this market share was taken by both green and amber drinks, while in the other school, only the consumption of amber drinks increased. We suggest that this easily applicable intervention circumvents some of the friction that accompanies banning sugar-sweetened drinks.

1. Introduction

Increasing evidence suggests that the consumption of sugar-sweetened beverages is linked to a number of adverse outcomes, especially among adolescents. Frequent (e.g., daily) consumption of sugary drinks is related to adverse health consequences, such as obesity, asthma and cardiovascular disease (Vartanian, Schwartz, & Brownell, 2007). Therefore, governing bodies and health organizations around the world have focused their efforts on decreasing the consumption of unhealthy beverages (Hawkes, Smith, & Jewell, 2015).

Health organizations have highlighted the importance of the school environment for influencing drink-choice behavior of adolescents (Institute of Medicine, 2012). Several school policies have been adopted with the aim of shaping students' health choices during the school day. These policies (see Chriqui, Pickel, & Story, 2014, for a review) involve, for example, replacing whole-fat drinks with low-fat alternatives and regulating the proportion of non-sugared vs. sugared drinks sold at school. Another prominent policy is increasing the assortment size of healthier drink options (Hawkes et al., 2015). Recent studies evaluating policies that involved an increase of the assortment size of healthier options showed mixed outcomes: Some studies showed promising re-

sults while others found no significant effect of the policy on consumption (Chriqui et al., 2014; Ganann et al., 2014). A possible explanation of these mixed results can come from studies examining the effect of assortment size on choice behavior. These studies report that increasing the assortment size can have undesirable effects such as information overload, consumer confusion, and disengagement from the decision process (Malhotra, 1982; Iyengar & Lepper, 2000). Although the negative effects of increased assortment size on choice behavior have not been shown in school settings, they have been tested in a wide variety of settings (such as laboratory settings, offline and online store settings) and products (food, electronics, financial products etc.; for a review see Chernev, 2012). Given their ubiquity, there is no indication to believe that these undesirable effects might not also occur in the school setting and thus undermine the effectiveness of assortment increase as an intervention to promote healthy drink choices.

One moderating factor that has been shown to alleviate the undesirable effects of the increased assortment size and boost the selection of the added (in this case healthy) options, is the extent to which added options appear to be virtuous (Sela, Berger, & Liu, 2009). If these options can easily be identified as being virtuous, individuals have less difficulty deciding for these options. Hence, it might not be sufficient to

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solely increase the number of healthy beverage options. These options also have to be clearly identifiable as being virtuous (e.g., as being beneficial from a health-related perspective) in order for them to be preferred after assortment-size increase.

Therefore, the aim of the present study is to test whether an increase in the assortment size of relatively healthier options coupled with cues that highlight their healthiness can be an effective intervention to decrease the consumption of the sugar-sweetened beverages.

2. Assortment size and the role of justification

The effect of increased assortment size on individuals' choices is an ongoing topic of debate. On the one hand, a larger assortment offers several benefits. For instance, increasing the assortment size enhances the feeling of perceived variety (e.g., Broniarczyk, Hoyer, & McAlister, 1998) and offers more decision flexibility (Kahn & Lehmann, 1991). On the other hand, a larger assortment has been associated with several downsides. Selecting from a large set of choices makes it more difficult for individuals to commit to any choice, as it induces a maximizing mindset (Schwartz et al., 2002). Furthermore, larger assortments can create information overload and deplete cognitive resources (Malhotra, 1982). Individuals without a previously triggered purchase intention may decide to defer from this kind of unpleasant decision processes (Iyengar & Lepper, 2000). Therefore, although increasing the assortment of a certain choice set is associated with certain benefits, many times it comes with certain costs, which make the effectiveness of this intervention questionable.

Increasing the assortment size of healthy drink options in schools appears to be associated with similar challenges. Studies involving an increase of healthy food and beverage options offered at school have generated mixed results. A recent systematic review of studies found positive effects on students' choice behavior following an increase in the number of healthy options in four out of six studies (Ganann et al., 2014). This finding suggests that the effect is weak or moderated by other factors.

Recent research has shown that there are several moderating variables which influence the outcome of the larger assortment on choice. These variables have been found to alleviate the negative effects of the larger assortment on choice, such as information overload. A key variable that has been found to mitigate these negative effects is the opportunity for justification (Simonson & Nowlis, 2000). Justification refers to the extent that individuals can rationalize their choice and provide convincing reasoning for their decisions. As the conflict and uncertainty associated with choice increases, individuals tend to focus on the justifiability of a choice as it alleviates the confusion created by the uncertainty. As a result, options that provide more justifiable arguments are more likely to be chosen (Shafir, Simonson, & Tversky, 1993).

Some choices are easier to justify. Studies showed that more utilitarian and virtuous choices are more justifiable than more hedonic and vicious choices (e.g., Kivetz, 1999). Individuals faced with difficulties created by a larger assortment are searching for more justifiable options (Sela et al., 2009). In general, choices that appear to be more healthy are considered more virtuous and are more easily justifiable (Sela et al., 2009). Therefore, we expect that highlighting the health dimension in the enlarged assortment will provide students with an easy justification for choosing healthy.

3. Nutritional food labeling and perceived healthiness

One way to highlight the healthiness (and thus the virtue) of food and beverage options is using a nutritional food labeling system called Traffic Light System (TLS). TLS has been used around the world to inform consumers about the nutritional value of food, to help them to get a better understanding on the level of healthiness of food products, as well as to direct them towards healthier choices (van Herpen & Trijp, 2011).

TLS categorizes food products in three categories, green, amber and red, with green being the most healthy and red being the least healthy category. The TLS has been operationalized in various ways such as either on the menu boards located over individual food stations, the shelves where the food is sold, or directly on the packaging. Irrespective of the way TLS is operationalized, findings show that it can have an effect on the perceived healthfulness of product choices, with green- and amber-labelled products being perceived as more healthy than members of the red category (Machin et al., 2018; Sonnenberg et al., 2013). TLS has been proven effective to differentiate the perceived healthfulness of choices and to foster negative attitudes towards unhealthy options also in school settings (Ellis & Ellis, 2007).

To conclude, the effect of increased assortment size on consumption appears to be volatile, in general as well as in the particular case of food and beverage consumption in schools. However, increasing the assortment of healthy options remains an important element of many governmental policies trying to decrease the consumption of unhealthy food options (Chriqui et al., 2014; Ganann et al., 2014). Finding a way to enhance the positive effect of the assortment size increase seems crucial for the success of such policies. Highlighting perceived healthiness of the beneficial drinks by implementing the TLS is a promising intervention that has been tested in several different settings.

In the present study, in line with past studies and governmental policies which introduced combined interventions (Wang & Stewart, 2012), we tested the combined effect of increased assortment size and highlighted (un)healthiness on the consumption of sugar-sweetened beverages in three Belgian schools.

4. Materials and methods

4.1. Design and procedure

We contacted high schools in a radius of 30 km around Brussels with the restriction that they had to host at least 500 pupils to have sufficient turn-over of drinks, offered drinks varying in healthiness, and that they were Dutch speaking. We made a list and called them one by one. When a school agreed, we assigned it to one of the conditions. The field study was conducted in a period of seven weeks in three high schools with a total of 2959 students. The first week was the baseline measurement (the week of April 24, 2017). In week 2, the schools went through the treatments which lasted until week 6. Week 7 was the post-treatment week where the treatments were withdrawn. Schools 1 and 2 served as the experimental schools where the treatments were introduced. In school 1 the treatments were introduced in the school's vending machines while in school 2 the treatments were introduced in the school's



Fig. 1. Implementation of the traffic light coding system in the vending machines of school 1.

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