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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 et al., 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 results while others found no significant effect of the policy on consumption (Chiriquí 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 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 et al., 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 (Sonnenberg et al., 2013; Machin et al., 2018). 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 (Chiriquí 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 cafeteria (Figures 1 and 2)[1]. School 3 served as the control school, therefore, no changes were introduced at the school.

We implemented TLS color coding, with green, amber, and red color used to signify high, medium, and low levels of healthiness, respectively. To categorize the drinks we used the following rule: green: no sugar (e.g., milk, water, soy), amber: some sugar and good nutrients (e.g., sweetly sugar sweetened soy drink, fruit juice) or artificially sweetened (sugar-free soft drinks), red: sugar and no good nutrients (e.g., sugared soft drinks). This categorization accords to recommendations by the Flemish Institute for Healthy Living (https://www.gezondleven.be/themas/voeding/voedingsdriehoek/dranken). We designed the panel with the color coding to fit on the vending machines as shown in Figure 1. For the cafeteria, we used the same display but then attached to the wall (Figure 2). The corresponding drinks in the different categories will be referred to as green, amber, and red drinks in the following. Furthermore, we increased the assortment of the two healthier categories, green and amber (see Table 1). In school 1, we added 5 new products in the green category and 6 in the amber one. In school 2, we added 3 new products in the green category and 4 in the amber category. We did not add any new products in the red category for both schools. The additions were not available on the Belgian market but were selected from other European markets to keep the study commercially neutral. We put the green drinks on the top rows, the amber drinks in the center rows, and the red drinks on the bottom row in the school where we offered the intervention via the vending machine. We measured the consumption for each product in all three schools for the seven-week period. For school 1 and school 3, data were obtained from the vending machines by the company who refills the machines. For school 2, we obtained data from the sales from the cafeteria of the school.

4.2. Data analysis

For each of the three schools and each of the seven weeks of the study period, purchase data were obtained for each of the offered beverages. For each week and school, we calculated the number of sold beverages per category (i.e., red, amber, green). For a first analysis of our main research question, we combined the data (a) across the five intervention weeks and (b) across amber and green drinks. We then submitted the data to a logistic regression with drink category (red vs. other) as outcome variable. School, study period (baseline vs. intervention vs. post-treatment), and the interaction of school and study period were entered as predictors. For the factor school, school 3 (i.e., the control school) was defined as reference category and for the factor study period, baseline was defined as reference category. If the intervention introduced in school 1 and school 2 (but not in school 3) affects the proportion of red drinks purchased in these schools, we would expect a significant interaction between our two predictors in their effect on beverage purchases. The proportion of red drinks should decrease during the intervention period in school 1 and school 2, and this decrease should be more pronounced than in the control school 3.

In a follow-up analysis, we examined whether a possible decrease in the proportion of red drinks in the intervention schools was associated with a corresponding increase in green drinks or with an increase in amber drinks. To this end, we repeated our analysis once while excluding all purchases of amber drinks and once while excluding all purchases of green drinks. If the proportion of red drinks is reduced relative to the proportion of green drinks (i.e., if purchases are shifted from red to green beverages), then we would expect to observe a corresponding school × study period interaction even when excluding purchases of amber drinks. If the proportion of red drinks is reduced relative to the proportion of green drinks (i.e., if purchases are shifted from red to amber beverages), then we would expect to observe a corresponding school × study period interaction even when excluding purchases of green drinks. Note that these two possibilities are not mutually exclusive as a reduction of red-drink purchases might coincide with an increase in both green-drink purchases and amber-drink purchases.

As indicated above, the interaction effect between study period and school is at the heart of our analyses. To parse this interaction, we computed a total of eight regression coefficients and tested them for significance (see also Table 2). For these significance tests, we used a corrected alpha-level of $\alpha = .00625$ (.05 divided by 8) to account for the number of tests.

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

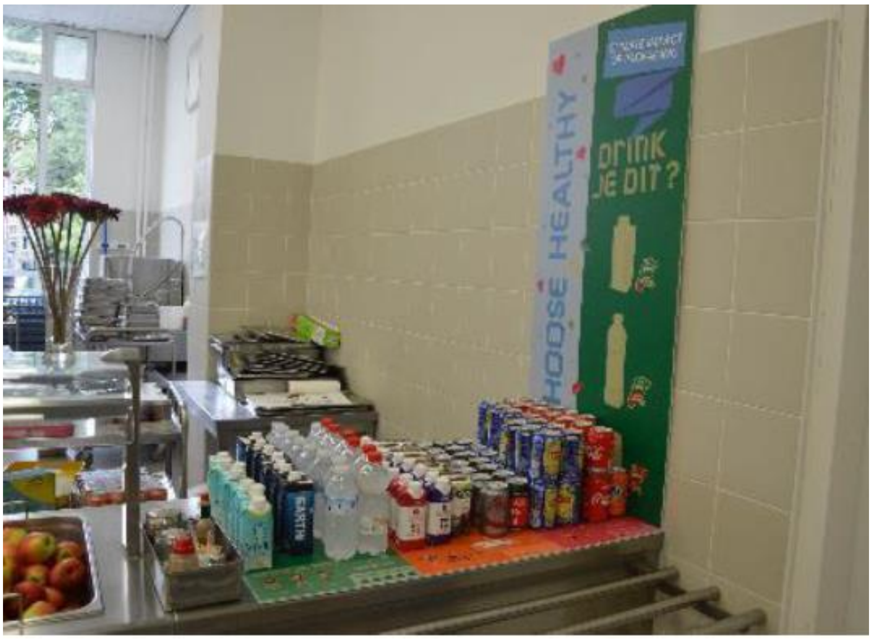

Figure 2. Implementation of the traffic light coding system in the cafeteria of school 2.

Table 1.

Assortment change over the three study periods, separable for the three participating schools

	measure	baseline (week 1)	intervention (week 2-6)	post-treatment (week 7)
school 1	vending machine sales			
green		water (2)	water (3), sugar-free green tea (1), flavored water (2), unsweetened soy drink (1),	water (2)
amber		sugar-free soft drink (1), juice (1)	sugar-free soft drink (1), juices (3), mildly sweetened soy/milk drinks (4)	sugar-free soft drink (1), juice (1)
red		sugar-sweetened soft-drinks (4)	sugar-sweetened soft-drinks (3)	sugar-sweetened soft-drinks (4)
school 2	cafeteria sales			
green		water (2)	water (3), sugar-free green tea (1)	water (2)
amber		sugar-free soft drinks (2)	sugar-free soft drink (1), juices (3), mildly sweetened soy/milk drinks (2)	sugar-free soft drinks (2)
red		sugar-sweetened soft-drinks (3)	sugar-sweetened soft-drinks (3)	sugar-sweetened soft-drinks (3)
school 3	vending machine sales			
Green		water (1)	water (1)	water (1)
amber		juices (3), sugar-free soft drinks (3)	juices (3), sugar-free soft drinks (3)	juices (3), sugar-free soft drinks (3)
red		sugar-sweetened soft-drink (1)	sugar-sweetened soft-drink (1)	sugar-sweetened soft-drink (1)

Note. The numbers inside the parentheses behind a product indicate the number of offered varieties of this products. For example, “water (2)” indicates that two different kinds of water (e.g., carbonated and non-carbonated) were offered.

5. Results

Over the seven-week period of our study, 19238 beverages were purchased in the three participating schools. Of these beverages, 38.8% belonged to the red category of sugar-sweetened beverages, 37.6% were amber drinks, and 23.6% were drinks belonging to the green category. Table 2 displays how purchases were distributed across the three drink categories, for each of the three schools and each of the three periods of our study. A more detailed distribution distinguishing between different products within each category can be found in the Appendix (Table A1).

Regressing drink category (red vs. other) on school, study period, and their interaction revealed a significant main effect of school, Wald(2) = 389.76, $p < .001$. In comparison to the control school, the proportion of red drinks was higher in school 1, Exp(B) = 9.93, 95%-CI = [7.86–12.56], Wald(1) = 368.50, $p < .001$, and in school 2, Exp(B) = 8.46, 95%-CI = [6.45–11.09], Wald(1) = 238.81, $p < .001$. The main effect of study period was not significant, Wald(2) = 3.35, $p = .187$. More importantly, we found a significant school × study period interaction, Wald(4) = 176.58, $p < .001$. From baseline to intervention, the proportion of red drinks decreased more strongly in school 1, Exp(B) = 0.30, 95%-CI = [0.24–0.39], Wald(1) = 87.51, $p < .001$, and school 2, Exp(B) = 0.37, 95%-CI = [0.27–0.49], Wald(1) = 46.12, $p < .001$, as compared to the control school 3. With regard to the contrast between baseline and post-treatment, neither school 1, Exp(B) = 1.05, 95%-CI = [0.76–1.44], Wald(1) = 0.08, $p = .781$, nor school 2, Exp(B) = 0.67, 95%-CI = [0.47–0.98], Wald(1) = 4.39, $p = .036$, showed a significant reduction in the proportion of red drinks compared to the control school. While the latter analysis revealed a trend towards a reduction in red drinks at post-treatment in school 2, this effect was not significant at the corrected alpha level of .00625. Hence, we found strong reductions in the proportion of red drinks in the intervention schools (compared to the control school) during the intervention period (compared to the baseline), but these differences were not significant during the post-treatment period (see also Figure 3).

Inspection of Table 1 reveals that some of the drinks available during the baseline period (i.e., one sugar-sweetened soft drink in school 1 and one sugar-free soft drink in school 2) were removed during the intervention period due to limited space in the vending machines/the dedicated area of the cafeteria. To ascertain that our results were not driven by the removal of these drinks, we repeated our analysis while excluding all data related to these discontinued drinks in the intervention schools. We found a similar school × study period interaction, Wald(4) = 241.81, $p < .001$, with relative decreases in the purchase of red drinks during the intervention period, $p < .001$ for both intervention schools, but not during the post-treatment period, $p > .100$ for both intervention schools.

In a next step, we tested whether the decrease in the proportion of red beverages in the two intervention schools during the intervention period was associated with corresponding increases in green and/or amber drinks. The first of our more focused logistic regression analyses involved the predictors school and study period (baseline vs. intervention) and the outcome variable drink category (red vs. green; i.e., amber drinks were excluded for this analysis). This analysis revealed a significant school × study period interaction, Wald(2) = 32.02, $p < .001$. From baseline to intervention, we observed a significant reduction (compared to the control school) in the proportion of red relative to green drinks in school 1, Exp(B) = 0.58, 95%-CI = [0.41–0.81], Wald(1) = 10.34, $p = .001$. No such reduction was observed in school 2, Exp(B) = 1.25, 95%-CI = [0.87–1.80], Wald(1) = 1.45, $p = .229$, indicating that the change in the proportion of red vs. green drinks from baseline to intervention did not differ significantly between school 2 and the control school. We then reran this analysis while excluding green instead of amber drinks. Again we found a significant school × study period interaction, Wald(2) = 160.91, $p < .001$. From baseline to intervention, the proportion of red relative to amber drinks was reduced (compared to the control school) in both school 1, Exp(B) = 0.22, 95%-CI = [0.17–0.30], Wald(1) = 110.53, $p < .001$, and school 2, Exp(B) = 0.09, 95%-CI = [0.06–0.14], Wald(1) = 110.92, $p < .001$. Hence, for school 1, the relative decrease in the proportion of purchased red drinks during the intervention period was associated with increased purchases of both green and amber drinks while for school 2, it was only the proportion of amber drinks that benefitted from the decreased purchase of red drinks.

Table 2.
Beverages purchases as a function of school, study period, and drink category

	baseline (week 1)	intervention (week 2-6)	post-treatment (week 7)
school 1			
green	14%	26%^{s}	15%^{ns}
amber	13%	33%^{s}	12%^{ns}
red	73%	41%	73%
school 2			
green	25%	22%^{ns}	27%^{ns}
amber	5%	36%^{s}	13%^{ns}
red	70%	42%	60%
school 3			
green	15%	24%	31%
amber	64%	57%	49%
red	21%	19%	21%

Note. ^{s}significant increase ($p < .00625$) relative to red category drinks, baseline, and control school 3; ^{ns}no significant change ($p \geq .00625$) relative to red category drinks, baseline, and control school 3.

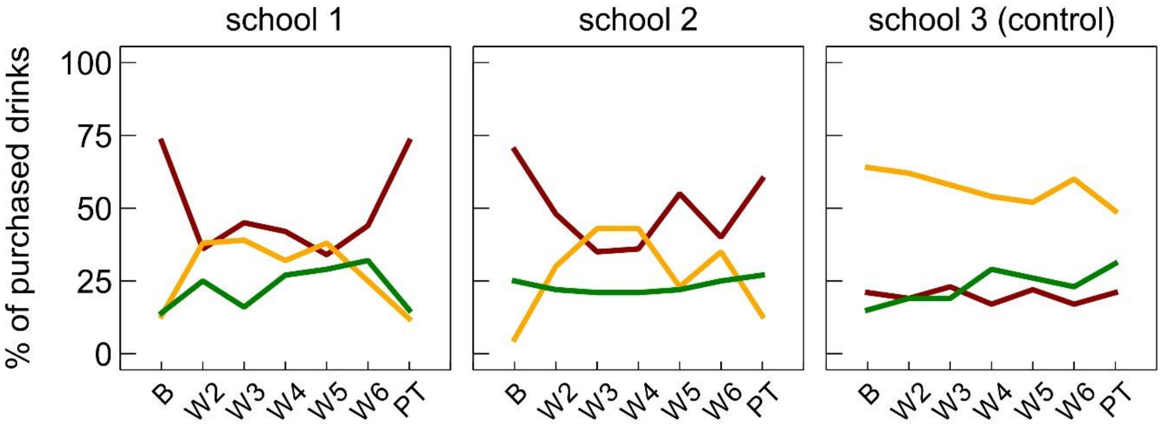

Figure 3. Proportion of beverage purchases as a function of drink category, school, and study week. The red lines correspond to the purchases of sugar-sweetened soft drinks belonging to the red category. Amber and green lines reflect purchases of amber and green drinks, respectively. The seven weeks of our study period (B = baseline, W2-W6 = intervention, PT = post-treatment) are depicted on the x-axis. The assortment size of green and amber drinks was increased and a traffic light coding system was implemented in school 1 and school 2, but not in school 3, during the intervention period.

6. Discussion

This field study tested the joint effect of assortment extensions and nutritional value information on the consumption of beverages in a school context. Two schools received the treatment and were compared to a control school. We found that increasing the assortment of healthy drinks while keeping the assortment of sugar-sweetened drinks constant, and implementing the TLS, jointly reduced the consumption of sugar-sweetened beverages. The effect is remarkably large, as the drinks from the red category lost about 30 percentage points market share (see Table 2). We then looked where the consumption shifted to. We focused on two categories of drinks: the very healthy ‘green’ category and the relatively healthy ‘amber’ category. For both of the treatment schools we found that students shifted to the amber category. Furthermore, we found that for one school the consumption was also shifted to the green category. Also noteworthy is that consumption levels returned to baseline when the assortment turned back to the pre-treatment state. The study shows that an assortment extension with a relative shift towards healthy offerings that is accompanied with a clear-cut justification aid (in the form of the TLS color coding) can produce an important behavioral change without needing to install politically difficult bans, expensive information campaigns, or income loss for the seller. This strong negative effect of the assortment increase of healthy products on the market share of the red drinks compares positively to the mixed results of earlier assortment-increase studies (Ganann et al., 2014). This suggests that our addition of the justification clue (i.e., the traffic light signal) may have supported the effect and adds to the evidence supporting the usefulness of TLS in school contexts (Ellis & Ellis, 2007).

At the same time, it is remarkable that the substantial behavioral change largely evaporates when the assortment goes back to the starting point. To some extent, this is understandable as the novel drinks that had the power to draw market share from the red category drinks, were removed again. It does suggest, however, that the traffic light intervention did not have a substantial impact beyond the decision situation.

7. Limitations and future research

A first limitation pertains to the nature of our design. Because of the invasive nature of the manipulations for schools, we decided to apply the intervention as a whole, rather than applying the elements in a two-by-two design. Related to this, we also chose one particular operationalization of TLS (it was implemented on the shelves and not in the menu or on the packaging). Literature has shown that TLS can be effective in every form it is implemented (Sonnenberg et al., 2013; Machin et al., 2018). Therefore we choose the most convenient and easy to implement operationalization, which could also encourage implementation by schools in the future. This implies, of course, that our results are specific to the particular form of TLS used in our study. We can only speculate if our intervention would have been equally effective if the TLS information was presented on the bottom of the vending machine or directly on the products it contained. Future research can try to address these limitations by systematically comparing different operationalizations of TLS. Some other limitations followed from the lack of control that is typical for field studies. First, the schools were not identical. It is hard to exclude that the effect was due to some unidentified school-specific characteristic. The fact that the two treatment schools react in a similar way and that the behavioral effect is large alleviates this concern to some extent. Nevertheless, further validation of the findings would be useful before they can be generalized. A more specific difference between the schools is related to the starting assortment. The control school offered only one sugar-sweetened soft drink as compared to three or four in the treatment schools. It remains theoretically possible that the crucial interaction that we found between treatment and treatment phase (before, during, after) is due to the limited assortment in the control school.

However, we think that this is not very likely as the pattern of consumption within the treatment schools clearly follows the intervention (see Figure 3). Other assortment differences may also have affected the specific percentages of market share change. The only way to solve this problem is to sample a larger number of schools.

A second limitation pertains to the fact that we do not know whose behavior changed. Did the consumers of red-category drinks shift their consumption to the other categories, or is the effect due to consumers who increased their consumption of beverages because of the new offerings? Figure 4 provides a tentative answer by showing that not only the market share, but also the absolute number of sugar-sweetened red drinks decreased during the intervention. Tracking of individual behavior in future studies may be helpful to further address this question.

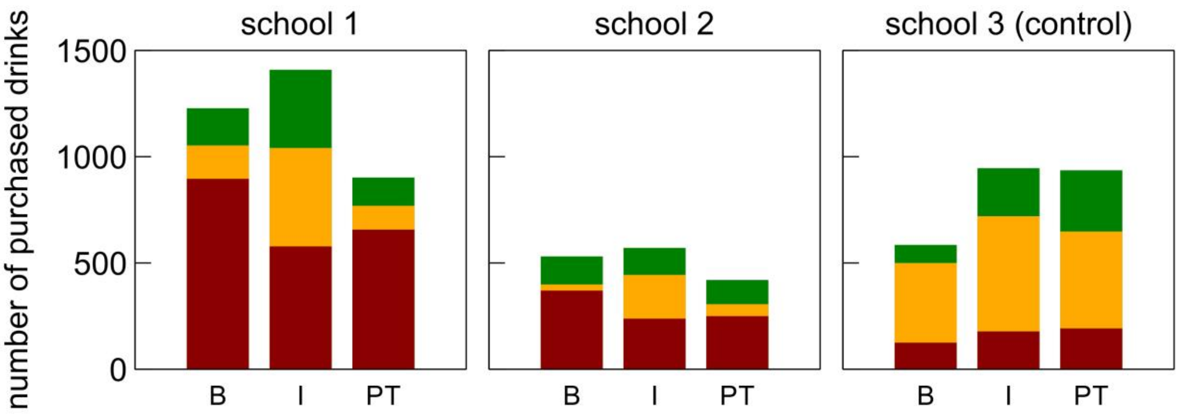

Figure 4. Absolute number of beverage purchases as a function of drink category, school, and study period. Purchases of green, amber, and red drinks are depicted in the corresponding colors and compared across study periods (B = baseline, I = intervention, PT = post-treatment). Note that the overall consumption increase in schools 1 and 3 could have been due to the hot weather in that period. That school 2 did not show a proportional upward trend may be due to the fact that accessibility to the cafeteria was limited (as opposed to the vending machines).

Third, the intervention was limited in time. We found that consumption returned to baseline when the assortment went back to the original state. From a practical point of view, it would be good to know (1) if the behavioral effect would remain intact if the assortment was changed permanently and (2) if a longer period of assortment change may lead to permanent shifts even when the assortment were (partially) turned back to the original state. Fourth, and related to the long term effects, our data do not allow to track consumption outside schools. The return to baseline consumption that we observed does not exclude the possibility that consumers keep drinking beverages similar to the intervention drinks outside school, or even bring them to school. In as far as this would entail a reduction of the consumption of drinks of the red category in a more permanent way, it may be an interesting research question to address from a practical point of view. Fifth, our data just show a bulk effect: substantial assortment changes accompanied with nutritional information draw away consumption from the red category. It may be interesting to assess how much assortment change is needed to produce a substantial behavioral effect. Last, our study does not explore the psychological mechanism underlying the shift in drink choice we observed in the treatment weeks. Future research can address this issue by conducting a study which will include two additional elements: a school where only the assortment change will be implemented and a questionnaire (in all schools) exploring how difficult it was for students to make their choices in the treatment weeks. These additional elements will allow to explore whether the TLS facilitates the shift in healthier choices by making the choice task easier.

Footnotes

[1]Note that for school 2, the two components of the intervention were introduced at different points in time. The assortment of green and amber drinks was increased in week 2 (see Table 1) while the TLS color coding was only implemented during the last three weeks of the five-week intervention period. By introducing intervention components in a stepwise manner, we

initially planned to dissociate possible effects of increased assortment size and added color coding. This analysis, however, was rendered infeasible by the drop-out of a fourth participating school. In this school, increased assortment size and color coding were introduced in the same stepwise manner as in school 2, with the only difference being that beverages were sold via vending machines (as in school 1 and school 3). Comparisons including this fourth school would thus have allowed dissociating effects of the separate intervention components and effects of context (vending machine vs. cafeteria). However, during two weeks of the intervention period, drinks belonging to the red category were out of stock in this fourth school, rendering the corresponding data unusable. Hence, even if the introduction of the second intervention component in school 2 had resulted in an incremental effect on drink purchases, we would not have been able to conclude whether this effect was specific to the cafeteria setting or whether it could also inform our interpretation of the vending-machine data from the other schools. That being said, the proportion of purchased red beverages did not change between the first two and the last three weeks of the intervention period in a manner that would be specific for school 2 (i.e., the school × study period interaction for this period was not significant, Wald(2) = 5.46, $p = .065$, see also Figure 3). We thus decided to pool the data for all five intervention weeks for school 2 for reasons of clarity and comprehensibility.

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Appendix

Table A1.
Number of products purchased per week, separable for the three participating schools

	measure	baseline (week 1)	intervention (week 2-6)	post-treatment (week 7)
school 1				
green	water	175	280	133
	green tea	-	16	-
	flavored water	-	68	-
	unsweetened soy drinks	-	4	-
amber	sugar-free soft drinks	54	123	31
	juices	103	136	81
	mildly sweetened soy/milk drinks	-	155	-
red	sugar-sweetened soft-drinks	896	578	657
school 2				
green	water	132	94	114
	green tea	-	34	-
amber	sugar-free soft drinks	29	23	56
	juices	-	113	-
	mildly sweetened soy/milk drinks	-	69	-
red	sugar-sweetened soft-drinks	370	238	250
school 3				
green	water	85	226	288
amber	sugar-free soft drinks	270	350	360
	juices	105	192	96
red	sugar-sweetened soft-drinks	125	178	192

Note. The sum of purchased products over the five intervention weeks was divided by five to obtain the average weekly consumption (rounded, no decimals) for this period.