Smarter Lunchrooms Can Address New School Lunchroom Guidelines and Childhood Obesity

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New US Department of Agriculture regulations have altered what foods schools offer for lunch, but schools cannot require students to eat specific foods. An intervention using the behavioral science principle known as "libertarian paternalism" led junior-senior high school students to eat more fruits and vegetables by making these foods more convenient, attractive, and normative. *(J Pediatr 2013;■:■-■).*

In January 2012, the US Department of Agriculture passed a series of regulations designed to improve the nutritional content of school lunches. These new nutrition standards require that school cafeterias participating in the National School Lunch Program restrict the frequency of favored, but less healthful, foods, such as French fries, and increase whole-grain offerings, cap the fat content of milk at 1%, and require students to take either a fruit or vegetable.[1] Unfortunately, forcing children to take healthy foods is costly and can result in reactance and avoidance behaviors,[2,3] often leaving these foods uneaten.[4]

A possible solution to this problem might involve use of the behavioral science principle known as "libertarian paternalism," defined as influencing but not restricting choices, so as to change behavioral cues. Changes that increase the convenience, attractiveness, and normative nature of healthy foods in the lunchroom[5] could encourage students to make healthier choices of their own volition.[6] Such low-cost changes would be consistent with promoting the healthier eating intended by the new guidelines, while enticing students to choose wisely rather than forcing choices on them.[7]

In the present study, we investigated how small changes to school cafeterias, suggested by the principles of libertarian paternalism, can influence the choice and consumption of healthy foods. This approach not only preserves choice, but also has the potential to lead children to develop lifelong habits of selecting and consuming healthier foods even when confronted with less-healthy options.

Methods

The field study was conducted in the cafeterias of Addison and Campbell-Savona Junior-Senior High Schools (grades 7-12) in western New York. This study was approved by Cornell University's Institutional Review Board. At the beginning of May, multiple interventions (collectively termed the "smarter lunchroom makeover") were implemented in a single afternoon, and these remained in place through June 2011 (**Table I**). The resulting experimental design is a before (March-April)–after (May-June) study, with schools as blocking factors.

During the study, trained field researchers visited both cafeterias and recorded tray waste for each student who purchased a school lunch. At Addison, data were collected on March 17, and 18, May 13 and 17, and June 8 and 13. At Campbell-Savona, data were collected on March 16 and 21, May 19 and 20, and June 6 and 9. A total of 3762 observations were obtained over 12 separate days. On 2 measurement days, March 17 and 18, starchy sides were not offered. Moreover, on March 21, consumption of starchy sides was not recorded. These dates were omitted in the analysis of starchy side consumption, leaving 2756 total observations.

To evaluate tray waste, the researchers used cards on which they noted available menu items on the lunch line and recorded whether a serving of a starchy side (eg, mashed potatoes, French fries, rice), fruit, or vegetables was not eaten, half-eaten, or completely eaten. Although starchy sides were not a focus of the lunchroom makeover, we included them in the study to examine whether the makeover increased the selection and intake of fruits and vegetables or instead triggered increased intake of starchy sides.

The impact of this smarter lunchroom makeover was estimated using a probit estimation procedure. Response variables in the estimating equations were selection and likelihood of consuming one-half or all of a serving of fruits, vegetables, or starchy sides. Independent variables in the regression include available side options on each day (to account for variations in behavior related to menu options) and a variable to account for differences in behavior between the 2 schools.

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Portions of this study were presented at the Agricultural and Applied Economics Association's Food Environment Conference (May 30-31, 2012, Boston, MA), the Annual Conference for the Society for Nutrition Education and Behavior (July 14-17, 2012, Washington, DC), and the Annual Conference of the American Public Health Association (October 27-31, 2012, San Francisco, CA).

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Table I. Interventions in the smarter lunchroom makeover

Category of change	Specific changes
Convenience: Improving the convenience of fruits and vegetables	"Healthy convenience line" with only submarine sandwiches and healthier sides (ie, fruits and vegetables) Salad served in see-through to-go containers Fresh fruit located next to the cash register 100% fruit juice boxes kept in freezer next to ice cream
Attractiveness: Improving the attractiveness of fruits and vegetables relative to other options	Lunch menu posted with nice color photos of fruits and vegetables served Vegetables labeled with descriptive names Fresh fruit displayed in nice bowls or tiered stands
Normativeness: Making the selection of fruits and vegetables seem normative	"*Would you like to try…?*" (verbal prompt by cafeteria staff) "*No veggie? How about…?*" "*You can get another side with your meal. How about grabbing a piece of fruit by the register?*" *Last Chance for Fruit* sign displayed next to fruit basket at the cash register

Results

The impact of the smarter lunchroom makeover was most evident in the selection and consumption of fruits and vegetables; there was no impact on the selection or consumption of starchy sides. Specifically, the results presented in Table II indicate that with the makeover, students were 13.4% (P = .012) more likely to take a fruit and 23% ($P < .001$) more likely to take a vegetable (although selection does not ensure consumption).

This smarter lunchroom makeover increased actual fruit consumption by 18% (P = .004) and vegetable consumption by 25% ($P < .001$). In addition, students were 16% more likely to eat an entire serving of fruit (P = .006) and 10% more likely to eat an entire serving of vegetables (P = .022).

Discussion

This smarter lunchroom makeover was notably effective because it guided students to make more healthful decisions—taking and eating more fruits and vegetables—even when a wide range of less-nutritious foods was available. Although the specific changes adopted by individual schools will vary, such a makeover appears to be scalable. The changes took only 3 hours to implement and cost less than $50. With more than 31 million children participating in the National School Lunch Program, a low-cost, effective, and easily scalable intervention such as the smarter lunchroom makeover is a feasible approach to addressing childhood obesity trends. This application of libertarian paternalism suggests that small changes in cafeterias and lunchrooms can have a significant influence in guiding students toward healthier behaviors.[8]

As a pilot study test of concept, this study provides a good foundation for future research in this area, but there are key limitations. First, this is a pilot study without a control school against which to compare behavior changes. This limits the general applicability and strength of our results. Second, tray waste data are repeated cross-sections, and do not track an individual student's consumption over time. Third, tray waste measures do not identify what specific fruit, vegetable, or starchy side students took and consumed, even though current US Department of Agriculture regulations focus on these groups. The foregoing limitations can be easily overcome with a large-scale study that can provide more concrete evidence for the potential efficacy of this smarter lunchroom intervention. Investigations of this simple and low-cost intervention could also include its effectiveness in the cafeterias of other institutions, including hospitals, companies, and retirement homes. ■

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Table II. Impact of a smarter lunchroom makeover on the selection and consumption of fruits and vegetables

	Students who took a serving, %			Students who consumed at least one-half a serving, %			Students who consumed an entire serving, %		
	Before makeover	After makeover	Change	Before makeover	After makeover	Change	Before makeover	After makeover	Change
Fruit	47.3	53.7	13.4 (.012)	40.4	47.7	17.9 (.004)	31.6	36.6	15.8 (.006)
Vegetable	35.8	44.0	23.0 (<.001)	33.7	42.0	24.5 (<.001)	18.7	20.5	9.8 (.022)
Starchy vegetable	14.7	13.6	−7.7 (.088)	10.0	9.7	−2.5 (.325)	6.0	6.1	1.4 (.387)

P values are in parentheses. The before makeover period extended from March to April; the after makeover period, from May to June. A total of 3762 tray waste observations were recorded during each period. Results are predicted mean percentage before and after the makeover. The percent change between the predicted means is also provided.

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