

« *Effective behavioral strategies for children food choices* »

Editorial

Establishing positive eating habits from early childhood is not easy in a world in which negative food habit development is largely favoured by the environment. This field has certainly grown during the last few years, however more data is still necessary in order to get positive and permanent eating habits.

This issue welcomes three interesting papers all dedicated to understanding some of the many factors that influence eating habits.

The first paper is dedicated to the relationship between short sleep and food choice. The authors demonstrate that adolescents sleeping less than seven hours per night show a 25 per cent decrease in the odds of having an adequate fruit and vegetables consumption and a 20 per cent increase in the odds of fast food consumption. Clearly, this study shows the complexity of the environment in which we live and how many different factors require consideration in order to improve our children's health. The study also suggests that increasing the length of sleep seems to improve healthy foods choice both by adults and adolescents.

The second paper concerns the importance of not skipping breakfast. A complex intervention, titled "Giocampus" targeting children between the ages of 9 and 11 years, their parents and their teachers was implemented from 2008 to 2011 in schools. The authors found that children who attended the course on nutrition had breakfast much more frequently than children who did not participate in the programme.

The topic of the third paper is also related to breakfast, but in this case the setting is very different and unusual. In this study, participants attending a conference were used as "Guinea pigs" by the authors who, very smartly, used a conference breakfast hall to implement an observational study. Modifying the foods served in a breakfast buffet successfully altered the food choice made by the attendants. The diners choose the first foods on the buffet regardless whether the foods were healthy or unhealthy. Using this as an example, it may be possible that children eating at the school cafeteria could be helped to rightly choose healthy foods in a safe and simple way, without spending a cent.

As the three studies show, it is important to look for innovative and inexpensive interventions, as they have to be long term to be effective. On the other hand, these types of interventions have been already largely applied by food industry. In supermarkets the presence of foods loved by children at children's height or close to the cash register is an effective selling strategy. The recruitment of sporting or television personalities to advertise snacks has been applied for many years in the marketing strategies of food industry, and the "Giocampus" protocol highlights its potential use to promote healthy eating.

Creating stable healthy eating habits for children and their families is a dream, and one that requires further work from a number of perspectives.

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Food choices and sleep duration in adolescents

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Short sleep duration among children and adolescents has been associated with higher body mass index and other adverse health outcomes including Type 2 diabetes, heart disease, and some cancers. Food choices are one proposed mechanism through which this association may occur.

This study examined associations between sleep duration and both healthy and unhealthy food choices in a large nationally representative sample of American adolescents (n=13,284). The study analyzed fruit and vegetable consumption and fast food consumption conducted through home interviews. Sleep duration was reported by adolescents.

The variable "F&V consumption" was defined as whether or not the adolescent reported eating at least one vegetable and one fruit in the previous day. The variable "Fast food consumption" was created from information about how often the adolescent ate fast food (eating fast food 0-1 times or 2+ times in the last seven days).

The variable "sleep duration" was reported by adolescents. Responses were organized into three categories in accordance with previous literature and recommendations from the American Academy of Pediatrics:

- short sleep duration (<7 hours/night),
- mid-range sleep duration (7-8 hours/night), and
- recommended sleep duration (>8 hours/night).

Researchers estimated three nested logistic regression models for two outcome variables: daily vegetable and fruit consumption and prior week's fast food consumption. Adjusted models included demographic and social/behavioral covariates.

More than 50 per cent of adolescents have fast food at least two times in the past week

More than half of the adolescents reported eating at least one vegetable and one fruit in the previous day and also reported consuming fast food two or more times in the previous seven days (respectively 55.9 per cent and 57.7 per cent). These adolescents who reported unhealthy food choices were significantly older and had significantly fewer siblings in the home.

More F&V consumption for adolescents reporting high level of physical activity and mother's education level of high school diploma/GED

Adolescents reporting high levels of physical activity had

significantly greater fruit and vegetable consumption and significantly less fast food consumption.

Adolescents reporting mother's education level of high school diploma/GED had significantly greater fruit and vegetable consumption, while adolescents reporting mother's education of some college or more education reported significantly lower fruit and vegetables consumption. Finally, adolescents reporting having two biological parents in the home had significantly greater fruit and vegetable consumption.

Short sleepers reported significantly lower F&V consumption and greater fast food consumption

Our investigation found that short sleep duration (<7 hours per night) was associated with 25 per cent decreased odds of adequate F&V consumption and 20 per cent increased odds of fast food consumption.

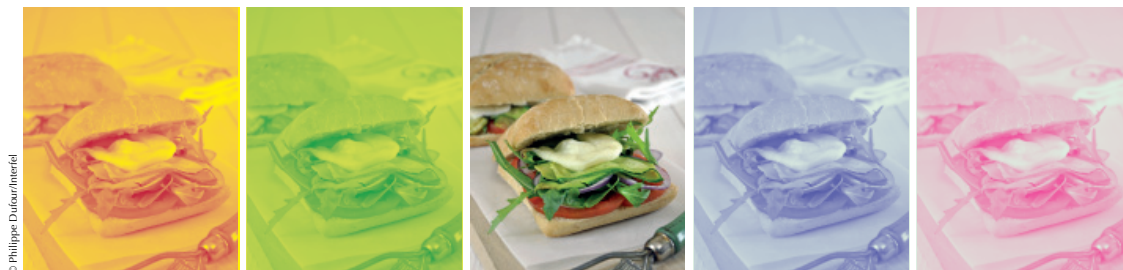
Interestingly, while the recommended sleep duration for adolescents is >8 hours/night, the analyses show that midrange sleepers (7-8 hours/night) do not have significantly decreased odds of consuming vegetables and fruit or increased odds of consuming fast food compared to the recommended duration. This suggests that the association of short sleep duration on dietary choices might occur only below a set threshold of habitual short sleep duration.

Other covariates that showed statistically significant associations with vegetable and fruit consumption included physical activity, screen times, age, sex, Hispanic ethnicity, other race, mother's education, and the presence of two biological parents in the home. Similarly, screen time, age, sex, mother's education, and number of siblings in the home showed statistically significant associations with the fast food consumption.

Our study demonstrates that sleep may be related to both healthy and unhealthy food choices of adolescents, with short sleepers being more vulnerable than adolescents with seven or more hours of sleep/night.

Health promotion and obesity-prevention interventions

Future research should seek to investigate the causal pathways of the observed associations. If evidence supports that chronic sleep deficiency is causally linked to poorer food choices, then programs that improve sleep and sleep hygiene might be an important and underappreciated component of health promotion and obesity-prevention interventions.



Based on : Kruger AK, Reither EN, Peppard PE, Krueger PM, Hale L. « Do sleep-deprived adolescents make less-healthy food choices? » Br J Nutr. 2014 May 28;111(10):1898-904.

An effective school-based intervention for breakfast promotion and overweight risk reduction

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The aim of this study was to evaluate the efficacy of a campaign promoting breakfast in primary school-children from the city of Parma, Italy, where in 2005, 22 per cent of peer school-children had reported to skip breakfast. The campaign started in all schools in the city of Parma from the first school-day in 2008 and ended on the last school day in 2011.

The campaign was part of a larger primary schools-targeted nutrition and sport educational program called GIOCAMPUS (the initial GIO-standing for “gioco”, which means “play” in Italian), supported by the Town Council, the School Inspectorate, the University of Parma, the Local Sport Clubs, and the Barilla Food Company based in Parma. The breakfast consumption campaign was promoted at different level by specific actions.

- **School:** the importance of consuming breakfast at home every day and its role in improving cognitive, learning and exercising skills were promoted weekly in the classrooms by teachers. This process was further supported by specifically trained undergraduates of the Nutritional Sciences course of the University of Parma, called the “Taste teachers”. These students ran specific classroom breakfast-centred activities and games that enabled children to “learn by playing” that a correct continental breakfast should include a cup of milk, bread or cereal products, and fruit. At the beginning of every school year, nutritional and educational training courses for teachers were organized.

- **Family:** a booklet titled “Alarm obesity” was distributed to all families involved in campaign program. One chapter of this booklet was devoted to breakfast and to the relationship between skipping breakfast and the risk for obesity. A weekly plan of breakfast was added in the booklet. Four hour- practical cookery classes for parents were carried out in the Barilla Food Academy, where first class Chefs demonstrated how it is possible and easy to prepare healthy breakfasts, snacks and other meals at home.

- **Pediatricians:** Paediatricians of the Parma city were informed about the three-year-campaign for breakfast promotion in schools and families and were asked to collaborate in spreading the information about the campaign to families. In this action, they were equipped with a kit, including both a poster to be displayed in their offices and a large number of leaflets showing the same weekly breakfasts plan that were distributed to the parents. The Paediatricians were updated on campaign actions and progress by a monthly newsletter published also on the Giocampus website (www.giocampus.it).

- **Summer Sport School (SSS):** all children admitted to the two-week SSS spent eight hours each day engaged in various sports and

physical activities under the supervision of professional instructors. The young campers ate snacks and lunch together always under supervision and following a menu suggested by pediatricians and dieticians.

- **Media:** the campaign benefited also from widespread promotion through local radio, TV and newspapers. Pediatricians, Nutritionists and Dieticians were regularly interviewed early in the morning on the nutritional, cognitive and exercise benefits from breakfast.

All the children enrolled into this study were requested on the 1st SSS day to answer a questionnaire on their breakfast habits. This questionnaire had previously been used in 2005. The questionnaire included questions with multiple answers and was completed before beginning any exercise with instructors. Children were asked to record whether, when, where, how and with whom they consumed breakfast, and what they did during breakfast, throughout the most recent consecutive one weekday before attending SSS.

Two groups of children attending SSS were interviewed on their breakfast habits through this multiple choice questionnaire. Group 1 counted only the children who underwent the intensive campaign (n. 341), and Group 2 a number of matched peers who did not attend any breakfast-promoting program (n. 291). Children who did not eat breakfast were found to be more numerous in Group 2 (17.5 per cent) than in Group 1 (8.0 per cent; $p=0.0001$).

In the Group 2 the percentage of overweight (18.4 per cent) was higher compared to Group 1 patients (11.7 per cent; $p=0.022$). No significant difference in obesity percentage (8.9 vs 5.0 per cent; $p=0.071$). Seventy five per cent of children in Group 1 and the 25 per cent of children in Group 2 ($p=0.031$) had one or two parents who had reported to skip routinely breakfast. Children with one or both parents used to skip breakfast had a greater odds ratio of 3.04 and 3 respectively of skipping breakfast compared to the children with parents who had regularly breakfast ($p=0.0002$).

Compared to the children tested in 2005, children admitted to the Giocampus program showed:

- a significant decrease in breakfasting (22 vs 8 per cent; $p=0.0001$);
- a significant decrease in overweight (18.5 vs 11.7 per cent; $p=0.003$) but not in obesity (7.5 vs 5.0 per cent; $p=0.138$) status;
- a significant increase in consumption of cereals ($p=0.0001$) and fruit ($p=0.0001$).

In conclusion, an intensive breakfast-centred strategy seems to be effective in breakfast promotion and in overweight risk decrease.



... « *it is possible and easy to prepare healthy breakfasts, snacks and other meals at home.* »

Eating with our eyes: the first foods seen are more likely to be eaten

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Selecting and eating healthful foods may seem like a natural thing to do, but many people seldom engage in healthful eating behaviors on a regular basis. Research performed by the Cornell Food and Brand Lab and Cornell Center for Behavioral Economics in Child Nutrition Programs has uncovered factors which could influence the taking and consumption of healthful foods in any food environment. New research from these labs show that the order in which foods are presented to diners has a dramatic effect on the type of foods selected and consumed.

Location, Location, Location

When food is presented in a buffet or serving line style, foods which are presented first have an 11 per cent advantage over all other items. This research was based on the evaluation of foods selected by conference attendees at a breakfast buffet. Two buffet lines were set and contained a variety of healthful and less-healthful items such as: low-fat granola, low-fat yogurt, fruit, cinnamon rolls, bacon, cheesy eggs, fried potatoes and bacon. One line was set with the healthful items first while the other line was set with the less-healthful items first. Conference attendees were then randomly assigned to a buffet line from which they would choose their meal. Regardless of the line set-up, over 75 per cent of diners selected the first food they saw and the first three foods a person encountered comprised 68 per cent of all the foods they took. Interestingly, when less-healthful items were placed first in the line, attendees also took 31 per cent more total food.

School Lunch Line Applications

The application of these theories in schools yielded similar results. When rearranging the lunch-line to feature a “targeted entrée” or an entrée which was deemed more healthful on that menu day, students took and ate more of it. In one case, the bean burrito which was moved toward the front of the line in a high school setting sold out in the second lunch period for the first time since its addition to the menu (almost five years prior!). This was an increase in selection of over 40 per cent. One caveat to this rule tends to center on vegetable sides. When vegetable sides were placed as the first item on the school lunch-line, selection actually decreased slightly. This is hypothesized to be result of the order in which plates are created. A consumer typically determines an entrée before selecting sides; however, more research on this issue is required.

Self-Serving Increases Consumption

When designing food environments to increase the selection of particular foods, one must consider whether individuals will actually consume the foods selected. The Cornell Food and Brand Lab has found that when a person self-serves, they will eat 92 per cent of what they put on their plate. This is important when considering how particular food items are presented. If the objective is to increase selection and consumption of foods, such as fresh fruits and vegetables, placing these items first is a simple way to accomplish both.

This research has applications in most food environments where consumers can self-select meals. Healthful food items should be placed first on the serving line to increase the likelihood of selection and eventual consumption.



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