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More apples fewer chips? The effect of school fruit schemes on the consumption of junk food

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ABSTRACT

Objectives: Using Italian data, we evaluate the effects on the consumption of unhealthy snacks of a European Union-wide campaign providing fruit and vegetables to school children and promoting healthy diet habits.
Methods: We use scanner data of supermarket sales in the city of Rome. Using a difference-in-difference approach, we compare the sales of these snacks before and after the campaign in supermarkets located within a 500 m radius of schools that participated to the program (the treated group) and in supermarkets located outside that radius (control group).
Results: We find that the campaign has been effective in reducing the increase in the sales of unhealthy snacks in treated stores – relative to control stores – only in the case of regular stores, which tend to locate in the wealthier areas of Rome. No effect is found, instead, for discount stores, where people with a higher risk of developing obesity are more likely to shop.
Conclusions: Our results suggest that the European School Fruit campaign has restrained the consumption of junk food in the sub-group of the population (wealthier families) who is less likely to be exposed to overweight and obesity problems, but has not been effective at all for the sub-group more at risk.

1. Introduction

Policy interventions to counter increasing child obesity in developed countries can be classified as information and market intervention measures. Information measures include campaigns, advertising regulations, labeling rules and nutritional education programs in schools [1,2]. These policies are expected to affect behavior because they increase awareness and knowledge of the health consequences of eating habits.

Examples of education programs in schools are the 5-a-day fruit and vegetable campaigns carried out in several countries and the EU School Fruit Scheme, which was launched at the end of 2008 on a European – wide scale and implemented during the following years in a number of member countries. These campaigns typically combine the distribution of products to students with the dissemination of information on correct health lifestyles, which favor the consumption of fruit and vegetables at the expense of unhealthy food such as salty and sweet snacks (snacks high in added sugar and/or saturated fat), which we label as "junk food" in the rest of the paper.

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The empirical studies that have tried to evaluate the impact of these policies typically find small positive effects on the consumption of fruits and vegetables, especially in the short run. In a recent review of this literature, Mazzocchi et al. [1], conclude rather pessimistically that"... the balance of evidence on the effectiveness of information campaigns and social marketing is that they raise awareness but do not affect behavior ..." (p. 119).

While most empirical studies to date have analyzed the effects of these campaigns on the consumption of fruit and vegetables, little has been done to investigate whether there have been effects on the consumption of junk food. Yet an increase in the intake of fruits is more valuable to combat overweight and obesity if it also leads to a reduction in the intake of "high-in-calories" food.[1]

In this paper, we study the effects of the European School Fruit campaign on the consumption of unhealthy salty and sweet snacks by using data on the daily sales of these products in a sample of supermarkets located in the city of Rome and its immediate periphery.[2] Although the consumption of fruit and vegetables in Italy is higher than in Northern European countries, poor nutrition is an important policy issue in this country as well, especially for young people. In Italy, the percentage of obese children has increased from 9 to 12.5% in less than ten years and close to one quarter of all children are overweight (National Health Institute [59]).[3]

Our empirical strategy is a "difference-in-difference" (DD from now on) technique, which consists of comparing the sales of junk food in supermarkets located within a radius of 500 m from schools which participated to the campaign (treated schools) with the sales of the same type of food by supermarkets located outside such radius. We define the first group of stores as treated stores and the second group as control stores. For both groups, we compare the daily sales of a broad variety of sweet and salty snacks before and after the education campaign took place. We find that the daily sales of snacks have increased during the treatment period both in treated and in control stores, and that the campaign has reduced the purchases of unhealthy snacks in treated stores – relative to control stores – by 0.99%.

When we consider all stores, independently of their type, the estimated DD effect is small and not statistically significant, which confirms the assessment by Mazzocchi and co-authors. When we distinguish between regular and discount stores, however, we find that the campaign has been effective in reducing the purchases of snacks only in treated regular stores. Compared to the control group, the purchases of junk food in these stores have declined after the treatment by 6.32%, a sizeable and statistically significant effect. In contrast, we do not find any statistically significant change – relative to the control group – in the purchases of snacks in treated discount stores. Since the campaign has not influenced the prices of snacks in treated supermarkets, we conclude that the estimated impact on the sale of snacks is not driven by differences in price behavior.

We interpret our findings in the light of a relatively large literature that has documented the positive relationship between higher levels of education and better health (see [3], for a survey and Brunello et al. [4], for a recent contribution covering several European countries). As suggested by Cutler and Lleras-Muney [5], better educated individuals are more prone to follow healthy behaviors and are better informed of the health consequences of bad eating habits. As a consequence, they are more sensitive to programs reinforcing this information. On the other hand, individuals with a poor socio-economic background are more likely to be affected by problems of self – control and time inconsistencies, which deter them from translating in good health behaviors the information received through the program [6,7].

Since consumers shopping in regular supermarkets tend to have higher income and better education than consumers shopping in discount stores, as documented indirectly by the higher price elasticity of demand that characterizes the latter group of stores, our results suggest that the European School Fruit campaign implemented in the city of Rome has restrained the consumption of junk food in the sub-group of the population who is less likely to be exposed to overweight and obesity problems, but has not been effective on the sub-group more at risk.[4]

If the effects identified by our empirical approach were spurious and did not genuinely reflect the causal impact of the School Fruit campaign, we should find similar effects on unrelated products. Yet, in a placebo experiment using the sales of coffee and liquid detergents, which are unlikely to be affected by the campaign, we find no statistically significant effect of the treatment both in the full sample and in the sub-groups of regular and discount stores.

We conclude that our estimates are unlikely to capture spurious effects. At the same time, however, since our data do not have information on the diet followed by the group of children targeted by the policy, our results have to be taken cautiously. Even if there was a tight relation between what children eat and what their parents buy, we cannot entirely rule out that targeted children have different consumption patterns from those implied by our data on supermarket sales.

The paper is organized as follows: Section 2 presents a review of the relevant empirical literature, Section 3 describes the School Fruit campaign as implemented in the primary schools of the city of Rome. Sections 4 and 5 introduce the empirical setup and the data. Results are

[1] Several papers, including Currie et al. [30], Dunn et al. [31] and Lhila [32], have shown that the consumption of junk food is correlated to obesity and to health problems.

[2] Unfortunately, our dataset does not include information on the consumption of fruit and vegetables. In Italy, at least 40% of the purchases of these products occur in local markets and at small greengrocers (data from the "*Osservatorio dei Consumi Ortofrutticoli delle famiglie italiane*"). Although the policy under scrutiny in this paper was implemented at the national level, we only have data on a (non-random) sample of supermarkets located in the capital city.

[3] See also Peracchi and Arcaleni [48].

[4] See García Villar and Quintana-Domeque [49] on the relationship between income and obesity in Europe, and Gallus et al. [50] and Gnavi et al. [51], for evidence on Italy.