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Article

# Opportunities for and limits to cooperation between school and families in sustainable public food procurement

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**Abstract:** This paper describes a research project carried out in an Italian public school to assess whether parents were willing to take part in food procurement decisions, as well as their ability to accurately predict what foods children would pick at school lunch and their propensity to support sustainable food choices made by the school. The methodology included a questionnaire to 500 parents and an in-depth study of 138 child/parent pairs. The study comprised: (i) presentation of an innovative recipe in the weekly menu of the school canteen; (ii) meal observations of children's intake at school lunch during the week of the menu modification; (iii) collection of both parents' and children's reports on their choices of recipes from the modified weekly menu. The results are commented in light of two important changes that have recently affected Italian public school food procurement: the opening of school canteens to lunches brought from home and the measures adopted since 2020 to contain the Covid-19 pandemic. Both events go in the direction of delegating to parents the multifaceted role of the school in the food arena. The article concludes that the results of the study should discourage this approach.

**Keywords:** school catering; sustainable food; public procurement; parents; children; food choices; involvement; Covid-19 pandemic.

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## 1. Introduction

Extensive literature has shown that school feeding programs can address major food challenges—such as eradication of hunger [1,2], reduction of obesity and other food-related diseases [3–7], development of local economies, ecological sustainability and ethics of food systems [8–14], education of consumers on food-related issues [15,16]—and bring about a mix of social, economic and environmental outcomes at the same time [17–21].

School meals play an important role in providing access to sufficient and safe nourishment for all, in both developed and developing countries, through nationwide, regional or local programs of free or heavily subsidized meals and breakfasts [22–27], guidelines on proper food preparation and consumption during school meals [28–30] and food education [16,31–32]. The school lunch is an educational moment in itself [16,33] and, in association with food educational activities, such as kitchen literacy courses, school-based gardening, farm visits, etc., it constitutes “a ‘whole school’ approach, in which the message of the classroom is echoed in the canteen” [34] (p. 6), teaching pupils food knowledge and correct habits [16,34,35]. Schools are also involved in the fight against obesity by providing healthy and balanced meals, avoiding junk food and beverages and offering opportunities for sport and physical activity [31,36–42]. Public school lunch programs are considered democratic tools to reach educational and social goals, because actions carried out at school may succeed in uniformly influencing the food behavior of numerous children simultaneously, reaching out to all socio-economic classes in a given nation [4,21,26,43,44].

The opportunity to interact with local producers (i.e., farm-to-school programs) and the preference for organic, fair trade, seasonal and fresh products in public food procurement has supported the socio-economic development and environmental sustainability of the food supply chain [9,26]. The diversification of school menus has been used as a tool to make room for cultural diversity and inclusion of different food choices for religious, ethnic and ethical reasons. Finally, the school lunch is considered a tool for gender justice, by promoting feminist goals, such as the social and economic recognition of those who perform the work of school feeding [45] and by providing care services outside the family, such as childcare during lunchtime at school, thus contributing to increased maternal labor force participation [46].

The school meal is all this. Gaddis and Coplen [45] say that, at its core, the school lunch is about caring for children. The act of feeding children—they continue [45] (p. 2)—is crucial for social reproduction, regarded by Giovanna Di Chiro [47] (p. 281) as “the intersecting complex of political-economic, socio-cultural, and material-environmental processes required to maintain everyday life and to sustain human cultures and communities on a daily basis and intergenerationally”. In several countries, such complex responsibilities are shared between school and families. In Italy, for example, children eat their mid-morning breakfast and lunch at school on average 200 days a year, and their calorie intake from school meals is equal to 40-50% of the recommended daily allowance [48–51].

Even though they share this responsibility, the two feeding environments (home and school) are almost completely separate; in addition, the role played by parents in education programs and procurement decisions related to school food is disregarded in governmental action. Parents undoubtedly have a large stake in school meals, since they actually outsource a portion of their feeding responsibilities to schools [52]. They often pay for the service, in whole or in part depending on their income [21]. Parents (mostly mothers) have also actively contributed to devising school lunch programs through individual initiatives, triggering collective interventions to increase the availability of healthy food and limit the presence of unhealthy options [43–55]. Constant and transparent communication between schools and parents is crucial to allow children to acquire healthy and sustainable food behaviors at home and school. The implementation of new technologies can help create stronger synergies between schools and parents for what concerns food. For instance, Swedish parents can download an app that lets them see what food their children were given at school, so that they can prepare something different for the evening meal [56].

In some cases, the relationship between school and families is negative and counter-productive. Several authors [57–59] have pointed out that some schools become paternalistic and authoritarian in their intent to educate parents; they target school lunchboxes and prescribe what parents can and cannot pack in their children’s lunch. For their part, parents may resist school policies by sneaking food into their children’s schoolbag or by producing false documentation about food intolerances, so that the school has no choice but to offer food that their children actually enjoy eating [60]. Familial habits and school food policies may be in direct opposition [61]. Oncini [60] concludes that parents regard meal policies as a mere imposition and not as a process in which all of the actors work toward reaching a shared educational objective.

Instead, the opinions of parents on school food would count much more if they simply took on a more active role, with greater commitment and awareness [62]. A more hand-on approach would allow parents to better understand public choices and identify actors that can help pursue common educational goals [60]. Stein [63] argues that the English public food procurement (PFP) initiative “Food for Life Partnership” owes its success to its embedding in the wider community of the schools, towns and cities where it operates and the ability to bring together the ideas not only of the pupils and the parents but also of the school and catering personnel in decisions about the school menu. Also Streiffer et al. [64] and Hekimian–Williams [65] point out the importance of community engagement, including parents and children, for the success of school food interventions. In sum,

although the role of parents in influencing school food choices could be significant, researchers have paid little or no attention to the matter [55].

This paper contributes to exploring the opportunities for and limits to cooperation between schools and families in sustainable PFP by reflecting on the Italian case, which has been regarded as an innovative example [9,35,67]. The reflection is conducted starting from the results of an investigation carried out in an Italian school to shed light on: (i) whether parents wish to participate in the decision-making process of the school PFP and are likely to endorse options that are innovative and sustainable; (ii) the parents' perceptions of and influences on children's eating at school. The results are discussed in light of two important changes that have recently affected the Italian school PFP: the opening of school canteens to lunches brought from home in 2016 and the measures adopted since March 2020 to contain the Covid-19 pandemic. Both events go in the direction of transferring to the parents the responsibility of the school in the food sector. The article concludes that, based on the results of our study, this trend should be discouraged, while it would instead be beneficial to foster initiatives that promote the involvement of parents in school food choices.

### *1.1. Italian School Public Food Procurement (PFP)*

In Italy, the school meal has traditionally been a tool to pursue social and environmental goals. As Oostindjer et al. [21] notes about other industrialized countries, Italian school food initiatives evolved with changing development objectives. After World War II, school canteens were pivotal in tackling hunger and malnutrition across the general population and in circulating the principles of healthy eating [68]. In the last few years, they have become places for the promotion of freshly produced, local and organic products. In 1999, Finance Law no. 488 [69] established a direct connection between public sector catering and the use of high-quality, local and organic food. Art. 59, comma 4, "Measures to facilitate the development of organic and quality agriculture" states that: "To guarantee the promotion of organic agricultural production of quality food products, public institutions that operate school and hospital canteens will include in the daily diet the use of organic, typical and traditional products as well as those from denominated areas. The awarding of catering contracts will be based on the quality of agricultural products offered." Thanks to the support of this "very innovative piece of legislation that establishes a direct and explicit link between organic and local food and public sector catering [9] (p. 69)", since the early 2000s the food quality standards and the sustainability of the service have greatly improved, building an increasingly careful and sensitive PFP. In 2017, the Italian Ministry of Agricultural, Food and Forestry Policies created a fund for organic school canteens, with a substantial financial endowment: 4 million euro in 2017, 10 million both in 2018 and 2019 and 5 million starting from 2020, cf. Decree Law no. 50 of 2017 [70].

Furthermore, by comprising the school meal within a much wider educational project, the Italian system makes it possible for public contractors to maintain control over each aspect of the service. Whereas several other countries have opted for cost-based contracting, which is centered on selecting low-cost contractors [2], in Italy catering contracts are awarded following the idea of 'best value', understood and assessed by considering not only the economic aspects (lowest price) but also the overall quality of the service and its compatibility with wider educational objectives [71].

The main purpose of the Italian school food education policy is defined by the Ministry of Education in the Guidelines for Food Education [72] (p. 19): "Food Education has as its ultimate goal the general improvement of the well-being of individuals, through the promotion of adequate eating habits, the elimination of unsatisfactory eating habits, the adoption of more hygienic food handling and the efficient use of food resources." Every food education activity must provide information about "safety; sensory characteristics; nutritional value; respect for the environment and resources in production, distribution and consumption; respect for the main ethical principles (social equity, animal welfare,

etc.) in production and distribution; gratification in purchase and consumption [73] (pp. 11–12)”. This goal is enriched by the need to complement the act of informing with an educational path that recognizes the complexity of eating behavior as a synthesis of physiological, psychological, social and cultural values. The school is understood here as a privileged place for the promotion of culture and relationships capable of “providing families and the community with the tools necessary to communicate and initiate a process of real change in eating habits [73] (p. 12)”.

A broad set of education projects have been carried out in Italian schools to support this goal. To tackle health conditions ascribable to poor eating habits, e.g., children obesity, Italy has joined the European “Joint Action on Nutrition and Physical Activity”, a program whose goal is to promote healthy eating at school [74] by means of its nutritional initiative “Gaining health” (*Guadagnare salute*) [75] and the school-based monitoring system called “Eye on health” (*Okkio alla salute*) [76].

The number of educational programs promoting healthy and sustainable food has undoubtedly grown in recent years [77]; nonetheless, enormous quantities of food waste are still produced by school canteens [78]; food neophobia, which is the unwillingness to eat types of food that are new or unusual, is widespread among children [79,80] and the share of overweight or obese children keeps increasing: 20.4% of Italian children are overweight and 9.4% obese, with higher values among children from families in the most disadvantaged socio-economic conditions [81].

### 1.2. *The Italian school lunch*

75% of Italian schools provide a school canteen service [82]. Hence, the majority of Italian children have lunch at school, i.e., at the kindergarten (children under 3 years of age), in nursery school (3-5 years), primary school (6-10 years) and middle school (11-13 years). School canteens serve both a mid-morning snack (mostly fruit) and lunch from Monday to Friday, from mid-September to mid-June, for a total of roughly 200 days a year. Younger children are usually given a one-hour lunchbreak, while primary and middle school children are allowed half an hour. A typical Italian meal includes a first course of complex carbohydrates (pasta or rice), a second course containing protein (meat, fish, eggs, cheese or legumes) along with a side serving (salad or cooked vegetables) and, lastly, fruit or dessert. Each course of the meal contributes to its overall nutritional quality.

The children cannot choose what to eat, because there is only one option for everybody, except those who follow a special diet for ethical, religious or health reasons. In addition, the portion sizes are pre-determined according to the pupils’ age and skipping a course or having a second helping is not contemplated. Although the children can obviously leave what they do not like, the teachers—who sit and eat with them until primary school and are then replaced by educators, since the school lunch is a didactic moment—invite the pupils to eat their whole meal. Two menus are offered during the year depending on the season, i.e., a spring-summer menu and an autumn-winter menu. Differences in the recipes served also depend on the age of the students (kindergarten, nursery, primary and middle school). The menu changes every day of the week and the same weekly menu is served again after 3-4 weeks. This set of rules ensures great variety in the dishes prepared to meet the pupils’ diverse tastes and promote high-quality eating.

### 1.3. *The parents’ role*

The school canteen is a service on individual demand, provided by the municipalities. Families can decide whether to feed their children at school or bring them home for lunch and then take them back to school in the afternoon.

According to Pagliarino et al. [83] (p. 105), Italian families contribute to school PFP by paying for the cost of the meal (around € 5.00 on average) in whole or in part, on the basis of family income. For what concerns the poorest families, the municipalities cover the complete cost of the service.

Families can become involved in the school canteen committee, a representative body that enables them to monitor the service and have a say in PFP decisions (e.g., recipes, suppliers, etc.) [84].

In Italy, 81% of schools organize food education courses and 63% offer extra-curricular activities regarding food, but parents take part in such activities in just 34% of the cases [82].

In 2016, 58 parents from the city of Turin appealed against the Municipality, responsible for the canteen service, and the Ministry of Education, to affirm the right of their children to eat at school food prepared at home. In its sentence no. 1049 of 2016, the Court of Appeal of Turin ruled that those parents had the right to have their children eat a meal in the school environment, but being able to choose between the menu available from the canteen and a meal brought from home. The same court then extended this right to all parents, paving the way for a home-prepared packed lunch for any family that prefers it [85].

Due to the Covid-19 pandemic, Italian schools were closed from March to June 2020. After the summer holidays, they reopened in mid-September 2020 and then closed again from October 2020 to April 2021, with a certain degree of heterogeneity among regions and school levels. The lessons continued online, but the canteen service was suspended throughout the closures, unlike what happened in other countries, where several strategies were developed to bring school meals to children's homes during the pandemic [86–88]. Conversely, Italian parents had to take care of their children's lunch without any help from the government.

## 2. Materials and Methods

The study was performed in the municipality of Moncalieri (province of Turin, Italy), in the "Nasi" state-run school, which is attended by nursery, primary and middle school pupils. The investigation was made possible thanks to the collaboration of the school management, teachers and canteen staff.

To shed light on whether the parents were keen on participating in the decision-making process of the school PFP and on supporting innovative and sustainable choices, the teachers were asked to administer a structured questionnaire to the whole population of families of the school. Some initial questions were intended to gather information on the respondents in terms of: (i) gender; (ii) number of family members; (iii) number of children and their gender; (iv) parents' job and perception of their own economic conditions. Then, the parents were asked if they would be interested in joining the school canteen committee, which is the representative body of families in charge of monitoring the quality of the service and proposing changes, for example, to recipes and suppliers.

Next, the parents were made aware of the opportunity to introduce changes to the standard school menu in order to make it more sustainable, i.e., replacing frozen fish of heavily fished species with fresh fish from organic, local aquaculture farms, and they were asked if, in this case, they would accept to pay more for their children's school meal. Four potential price increase options (€ 0.03, € 0.06, € 0.09 and € 0.12) were presented, corresponding to a realistic estimate of the price increase for each meal if the school canteen served fresh fish costing respectively € 1.00, € 2.00, € 3.00 or € 4.00 more than the frozen fish normally served [83] (p. 110). An option corresponding to no price increase (€ 0) was also included. An open-ended question allowed the parents to explain the reasons for their choice.

We performed an experiment to evaluate the parents' ability to predict what food their children would choose to eat at school, what impact the personal tastes of both parents and children have on food habits at school, the importance of being familiar with numerous kinds of food and the degree of responsible consumption by both parents and children. The experiment saw the participation of 138 parent/child pairs from two nursery school classes, an elementary school class and a group of students from various middle school classes. First, the school menu of a specific week was considered; it included the



standard dishes normally served in the canteen, along with an innovative recipe, introduced because of its sustainability but unusual for the children and their parents, i.e., fillet of fresh trout, farmed in local and organic farms, instead of frozen fish fillets from heavily caught species, such as cod or flounder. The parents were invited to provide their opinions in relation to each dish (around 20 recipes in total for each child, with some menu variations owing to differences depending on the pupils' age), on a 4-point Likert scale (*not at all, not much, sufficiently, a lot*) regarding:

- whether their children would appreciate the dish;
- whether their children would eat the dish, when the recipe was served the week after;
- whether they themselves appreciated the recipe;
- how frequently the dish was cooked at home (level of familiarity).

To conclude, the parents had to state whether they wanted to keep the recipe in question or remove it from their children's school menu.

The questionnaire was given by the teachers to the parents and then filled out at home, without input from the children, in the week before the menu was actually served in the school canteen.

Immediately after lunch on each day of the week when the recipes were served, the pupils were invited to rate each of them using a similar questionnaire based on the same Likert scale (*not at all, not much, sufficiently, a lot*) concerning:

- whether they appreciated the recipe;
- whether they actually ate the dish.

To conclude, the children had to state whether they wanted to keep the recipe in question or remove it from the school menu. The questionnaire items were read out to the younger pupils, whereas middle-school children were considered more autonomous and were invited to complete the questionnaire by themselves.

In addition, the amount of food that each pupil ate was measured for each recipe and for each day of the week at the end of each meal. The leftovers on the plate were observed and consumption was estimated on the basis of the above Likert scale. The data provided by every child/parent pair were matched and kept as individual sets.

The data were processed by means of a descriptive statistical analysis, including pairwise correlation ( $r$ ), and by estimating multiple regression models.

### 3. Results

500 parents whose children stay at school for lunch answered the questionnaire, aimed at assessing the families' interest in becoming members of the school canteen committee and willingness to pay for sustainable innovation in the school menu. It was the mother who filled out the questionnaire in 83% of the cases and the father in 17% of the cases. 60% of the families have 2 children, 17% one child, and the remaining families have between 3 and 5 children. 72% of parents regard their economic condition as low or medium-low income.

Most parents (75%) state that they are not interested in joining the school canteen committee, 23% of the parents would like to join, whereas 2% are already members.

Table 1 shows that most families are not willing to pay extra to make the school menu more sustainable (the scenario presented to them entailed introducing fresh fish of local varieties from organic farms to replace frozen fish of heavily fished species), since they believe that any additional costs for sourcing high quality and sustainable foods should already be covered by the current price of the school lunch.

**Table 1.** Parents' willingness to pay extra for including an innovative and sustainable recipe in the school menu.

Extra price (€)	Percentage of families willing to pay the extra price
0.00	54
0.03	6
0.06	7
0.09	9
0.12	24

The analysis focusing on the child/parent relations involved 138 pairs, whose distribution is shown in Table 2.

**Table 2.** Parent/child distribution in terms of school, age and gender.

Children's school	Children's gender	Parents' gender
<i>Nursery school</i> (children aged 3-5 years)	47	80
<i>Primary school</i> (children aged 8-9 years)	23	58
<i>Middle school</i> (children aged 11-13 years)	68	No response
<b>Total</b>	<b>138</b>	<b>138</b>

The analysis of the different variables describing the food choices of each parent/child pair yielded a large set of results, but the discussion in this article is limited to the data that might affect the PFP system, i.e., (i) the criterion based on which the parents decide to keep a recipe or remove it from the school menu; (ii) the parents' ability to predict which recipes their children will like at school, exploring in particular the different patterns of behavior in the case of traditional dishes vs. the innovative and sustainable dish.

A multiple linear regression model makes it possible to study the direct relationship that links the variable *elimination\_choice*, referring to the parents' decision to maintain a recipe or remove it from their children's weekly school menu, to a set of potential explanatory variables, according to equation (1):

- children's age and gender;
- parents' assumptions about their children's preferences (liking) and choices (consumption);
- children's school food attitude (squeamishness or adaptivity);
- parents' attitude toward the recipes in the school menu (familiarity and liking).

$$\text{elimination\_choice} = \alpha \text{age} + \beta \text{gender} + \delta \text{liking} + \eta \text{consumption} + \pi \text{adaptivity} + \varphi \text{familiarity} + \Omega \text{parent\_liking} + \varepsilon \quad (1)$$

Squeamishness describes the children's propensity to refuse food if it is not to their liking. Conversely, adaptivity is the propensity of children to eat food even when they do not particularly appreciate it. In our database, this variable quantifies the children's actual propensity and not the parents' assumptions about their children's behavior. It is measured as the distance between the preferences expressed verbally by the children and the consumption actually measured in the canteen.

Regression Model 1a. (Table 3) indicates that the most important explanatory variable for the parents' decision to remove a recipe from the weekly school menu is their assumption about their children's food consumption at school. Parents are more likely to

recommend recipes that they believe their children will eat more keenly at school. Regression Model 1a. also reveals a moderately significant relationship between the food choices that the parents make for themselves and their children at home (familiarity) and the options that they recommend for their children at school. The parents' familiarity with the dishes on the school menu, measured according to their cooking frequency at home, is moderately significant and negatively correlated with the likelihood that the parents will remove them from the lunch menu.

As the age of the children goes up, the frequency with which the parents remove recipes from the school menu increases sharply. Indeed, a positive and significant correlation exists between the variable measuring the age of the children and the frequency with which the parents decide to remove undesirable recipes from the weekly school menu.

**Table 3.** Model 1a. Parents' recommended choice for the weekly school menu recipes.  
N = 115; R-squared = 0.3292; Adj. R-squared = 0.2853.

Variable	Coefficient	Std. Err.	T	P>t	[95% Conf. Interval]	
Children's age	0.014	0.005	2.760	0.007	0.0039416	0.0241542
Children's gender	-0.007	0.032	-0.230	0.817	-0.0700555	0.0553955
Parents' prediction of children's liking	0.010	0.064	0.150	0.879	-0.1170261	0.01365264
Parents' prediction of children's consumption	-0.156	0.055	-2.860	0.005	-0.2644378	-0.0479962
Squeamishness	-0.047	0.048	-0.970	0.332	-0.1422331	0.0484499
Familiarity	-0.061	0.037	-1.660	0.100	-0.1332872	0.0118253
Parents' liking	-0.021	0.044	-0.480	0.632	-0.1074623	0.0655225
Constant	0.699	0.152	4.600	0.000	0.3973622	1.000251

When considering the innovative and sustainable recipe (Model 1b. in Table 4), the parents' choice to keep it or eliminate it from their children's school menu is mostly determined by their assumptions about whether their children will enjoy the dish. In our experiment, the recipe featured fresh trout fillet from organic and local aquaculture, a product rarely used in collective catering services, where the most widely cooked fish belongs to varieties that can be readily transformed into already portioned and boned frozen slices or fillets, such as cod, plaice, etc. The parents are more likely to favor the new recipe if they think that their children will be eager to eat it at school. As expected, the familiarity variable has a smaller effect on this decision, while the variable accounting for the parents' appreciation of the recipe plays a bigger role. As shown in Table 4, the parents tend to endorse the inclusion of the innovative recipe if they themselves appreciate it. Lastly, their tendency to be more selective as their children grow older remains unchanged.

**Table 4.** Model 1b. Parents' recommended choice for the innovative and sustainable recipe.  
N = 65; R-squared = 0.3857; Adj. R-squared = 0.3336

Variable	Coefficient	Std. Err.	T	P>t	[95% Conf. Interval]	
Children's age	0.050115	0.019805	2.53	0.014	0.0104852	0.089745
Children's gender	0.07602	0.09652	0.79	0.434	-0.1171173	0.269156
Parents' prediction of children's consumption	-0.10181	0.048713	-2.09	0.041	-0.1992817	-0.00433
Familiarity	-0.07912	0.057715	-1.37	0.176	-0.1946047	0.036369
Parents' liking	-0.15007	0.049697	-3.02	0.004	-0.2495105	-0.05062
Constant	0.690619	0.236175	2.92	0.005	0.2180333	1.163205



The significant impact of consumption predictions on the parents' decision to retain or remove a recipe from the weekly school menu means that it is vital to understand whether the parents are good at guessing their children's food choices at school.

To begin with, the parents' ability to make correct assumptions about their children's food consumption was analyzed by means of pairwise correlation ( $r$ ) between the variables regarding the parents' predictions and the actual food consumed by the children at school. After lunch on each day of the experiment, the actual amount consumed by each child was measured for each recipe by observing what was left on the plate and by estimating consumption using a 4-point Likert scale (not at all, not much, sufficiently, a lot). The data for each child were then matched to the data provided by the parents (assumptions about their children's consumption), and these were kept as individual sets.

As shown in Table 5, the parents' ability to predict what their children actually choose decreases in the case of an innovative recipe.

**Table 5.** Correlation between children's actual consumption and their parents' predictions about consumption.

Type of recipe	Pairwise correlation
Weekly school menu recipes	$r = 0.52$
Innovative and sustainable recipe	$r = 0.36$

Next, a multiple linear regression model was estimated to identify the factors that have a stronger effect on the parents' ability to make predictions about their children's food consumption choices at school. In detail, we analyzed the relationship between the mistaken predictions made by the parents and a set of explanatory variables, which might be able to account for the children's and parents' personal traits and the parents' attitudes. The model measures the variable `consumption_prediction` in terms of distance, in absolute value, between the food consumption stated by the children and the related consumption predictions made by their parents, according to the following equation (2).

$$\text{consumption\_prediction} = \alpha \text{age} + \beta \text{gender} + \delta \text{parent\_age} + \Omega \text{parent\_liking} + \varphi \text{familiarity} + \eta \text{liking\_prediction} + \varepsilon \quad (2)$$

As Model 2a. (Table 6) clearly indicates, mistakes in the parents' predictions about their children's food consumption are most ascribed to the parents' inaccuracy in predicting the level of appreciation. The less the parents are able to predict whether their children will like a dish, the more inaccurate they are in predicting consumption. If the parents know their children's food preferences well, then they are much better at guessing their children's choices in advance. Another element that can be gleaned from Model 2a. is that the parents more accurately predict consumption at school in relation to types of food that are more regularly prepared at home. In fact, the mistakes made by the parents with regard to their children's lunch choices decrease as the parents' familiarity with the foods increases. Furthermore, prediction mistakes occur less frequently when the parents themselves enjoy the recipes in question. In brief, the parents are more often correct in predicting consumption for what concerns the types of food that they themselves like and frequently cook at home.

**Table 6.** Model 2a. Parents' predictions about their children's consumption of school menu recipes.  
N = 112; R-squared = 0.5269; Adj. R-squared = 0.4999.

Variable	Coefficient	Std. Err.	T	P>t	[95% Conf. Interval]	
Children's age	-0.0088716	0.0094813	-0.94	0.352	-0.0276712	0.009928
Children's gender	0.0005896	0.0545964	0.01	0.991	-0.1076649	0.108844
Parents' age	0.0072212	0.0047207	1.53	0.129	-0.0021391	0.016582
Parents' liking	-0.12134	0.0693446	-1.75	0.083	-0.2588375	0.016157
Parents' familiarity	-0.2052011	0.0625126	-3.28	0.001	-0.3291519	-0.08125
Parents' prediction of children's liking	0.7083512	0.0780897	9.07	0	0.5535137	0.863189
Constant	1.040563	0.3097389	3.36	0.001	0.4264077	1.654718

The addition of an innovative recipe seems to follow the same patterns detected in the case of traditional recipes (Table 7): the better the parents are at guessing in advance whether their children will appreciate a certain type of food, the more they are able to make accurate predictions about actual food consumption at school. Unsurprisingly, the familiarity variable is less significant in this situation, and the same is true for the variable referring to the parents' personal appreciation.

**Table 7.** Model 2b. Parent's predictions about their children's consumption of an innovative and sustainable recipe.  
N = 52; R-squared = 0.6373; Adj. R-squared = 0.5890.

Variable	Coefficient	Std. Err.	T	P>t	[95% Conf. Interval]	
Age	-0.0190192	0.0457199	-0.42	0.679	-0.1111039	0.073066
Gender	0.2699757	0.1566207	1.72	0.092	-0.0454745	0.585426
Parents' age	0.0067821	0.0141406	0.48	0.634	-0.0216986	0.035263
Parents' liking	-0.0738171	0.0820699	-0.9	0.373	-0.2391144	0.09148
Parents' familiarity	0.1578939	0.0954028	1.66	0.105	-0.0342572	0.350045
Prediction of liking	0.6984663	0.0875601	7.98	0	0.5221111	0.874821
Constant	0.0514797	0.6100236	0.08	0.933	-1.177171	1.28013

To interpret Table 8, it is worth keeping in mind that the level of consumption and the level of appreciation of a given recipe—based on a range of 4 equidistant values on a Likert scale, i.e., not at all, not much, sufficiently, a lot—are translated into numeric values between 1 and 4. Also, the decision to keep a recipe or remove it from the school menu is expressed by a dummy variable, which is 0 when the recipe is kept and 1 when it is discarded. Our evidence reveals that the pupils choose innovative recipes more often (3.67 vs. 3.49) and appreciate them more (3.03 vs. 2.83) than other recipes featured on the weekly school menu. Nonetheless, they are more likely to eliminate the innovative recipe than a more traditional one (0.41 vs. 0.39). As for the parents, they believe that their children will eat and enjoy traditional dishes more than the innovative recipe. When compared to the children's actual food behaviour at school, the parents' predictions about appreciation and consumption are pessimistic, as confirmed by prediction values that are consistently lower than the actual values describing how children behave when they have lunch at school. Although the parents are much less willing to remove recipes from the school menu than their children, they too eliminate the innovative recipe more often than traditional recipes (0.28 vs. 0.15).

**Table 8.** Comparison between children's actual food consumption and parents' predictions.

Variable	Children's behavior		Parents' prediction on children's behavior	
	N	Average	N	Average
Total recipes consumption	135	3.49	119	2.87
Total recipes liking	135	2.83	118	2.88
Total recipes elimination choice	135	0.39	119	0.15
Innovative recipe consumption	60	3.67	75	2.53
Innovative recipe liking	80	3.03	72	2.57
Innovative recipe elimination choice	80	0.41	75	0.28

#### 4. Discussion

The results of the study show that the parents' greatest concern is that their children eat enough food during the school day. This conclusion is in line with those of other authors [89–91], who have highlighted that the priority for working-class mothers is to keep the children fed on a day to day basis. This is the principle that helps them decide whether or not to keep a recipe on the school menu. They do not remove a recipe if they think that their children will eat it. This attitude matches their behavior at home, where they more regularly cook the same recipes that they are inclined to keep on the school menu. The parents tend to recommend recipes that they cook at home and they are sure their children will like. These findings are consistent with Wardle et al. [92], according to which parents prefer to give their children the foods that they are most willing to accept.

When an innovative recipe is presented, the parents' main concern, i.e. consumption by their children at school, remains unchanged but, since they cannot rely on their familiarity with the food, they use their personal taste to guide their decisions. Also Skinner et al. [93] find that mothers tend not to introduce their children to foods that they themselves dislike. Parents seem to be unaware of the very tenuous correlation between adults' food preferences and those of their children, a phenomenon known as the "family paradox" [94–97].

In general, it appears that the parents indulge their children's food preferences, choosing recipes according to predictions about appreciation and consumption. As the children grow older, the parents become more selective, probably because they are aware that their children have become more selective too, although there is no consensus in the literature around this point. Several investigations have concluded that children's eating habits are relatively stable over time [93,98,99], while others have found that children are more selective as they get older, reporting an age-related deterioration in the quality of their diets [100,101].

The parents are not particularly good at making assumptions about their children's food choices at school. Their level of accuracy ( $r=0.52$  for traditional recipes and  $r=0.36$  for the new recipe) is no higher than the levels suggested in the literature for what concerns the ability to predict attitudes, interests and buying behavior of peers ( $r=0.53$ ) and spouses ( $r=0.51$ ) [102] or the accuracy of spouses in predicting each other's appreciation of new product concepts ( $r=0.27$ ) [103]. When compared with the values reported in research on how accurately parents predict their children's meal preferences and school lunch choices [104, 105], the results of our study point to low reliability with regard to the parents' capacity to predict their children's actual consumption. The parents are more able to guess the choices of their children in relation to the foods that they cook most often at home and they know their children like. This evidence corroborates the conclusions of Mata et al. [104], pointing to the fact that parents do better when predicting what foods their children will enjoy than when guessing what they will not like.

As a rule, the parents do not seem eager to eliminate recipes from the school menu, which proves that they trust the decisions made by the public administration and might also explain their lack of interest in joining the participatory decision-making body, i.e.

the school canteen committee. This result is in line with Lareau [89], which reveals that working-class parents tend not to intervene in school-related matters because they value the expertise of educators and school officials.

Furthermore, the evidence illustrated here points to a negative attitude of the parents toward the innovative and sustainable recipe, since they expect their children to eat and appreciate it less than other recipes and, as a consequence, tend to remove it more often. They do not show a great sense of responsibility toward more sustainable food choices and, at the same time, their predictions about the innovative dish are pessimistic. The children display the opposite behavior because, on average, they eat and enjoy the innovative recipe more than the more traditional ones, but they state that they want to eliminate the innovative recipe more often than the others.

The results of our study confirm that children's eating habits change between home and school, where they are influenced by the behavior of schoolmates and teachers [106–108]. Yet, as is widely held, children's food acceptance and choice are mostly driven by taste preferences and liking [109–116]. At the same time, several studies underline the powerful relationship between familiarity and preferences [92,101,117]. Parents can have a direct impact on their children's diets by increasing exposure to certain foods, preparing them more frequently at home and supporting the choices made in school canteens [118–122].

It is worth noting that in Italy the educational values attached to the food eaten at school are expected to be conveyed not only to the children but also to their families [35] (p. 4). Hence, greater parental involvement in the education and decision-making processes would be extremely beneficial. For example, parents of pupils attending schools where interventions are carried out make overall healthier food choices when shopping than parents of students in control schools [120,123,124]. According to Morgan and Sonnino [35], parents should be empowered and knowledgeable actors who have the ability to make informed choices. Many scholars [63–65,67] argue that the role of all social actors, including parents, is essential for the success of food policies.

At present, in the Italian school system the parents can become involved, through the representative body of the canteen committee, in the definition of lunch menus, making proposals and asking for the elimination of recipes that they consider unwanted by the children. Our study suggests that, in this type of collaboration, parents are not reliable because they are not good at predicting their children's choices and tend to eliminate recipes that they believe their children will not like, even though they are sustainable. For the same reason, the choice made by the Court of Appeal of Turin in 2016, which first gave children the right to eat a meal prepared at home during school time, also appears inappropriate. School meals significantly contribute to the daily food intake of students and are generally more nutritious than meals from other sources, including those brought from home [125], and more suitable for combating obesity [42,126]. This is especially true for students from underprivileged families, in which obesity and food insecurity are both higher since they are related to each other [81].

What might be beneficial, instead is for the parents of schoolchildren to take an active role in food education actions, so far almost completely neglected [82]. This would enable them to become precious allies in the innovation process pursued by the public administration aimed at achieving social and environmental goals.

In Italy, the Covid-19 pandemic heavily influenced the pursuit of these objectives. With the closure of schools, the canteen service was suspended without offering families any help, unlike what happened in other countries [86–88]; meanwhile, poverty was increasing [127]. The strategies adopted in many countries, but not in Italy, involved a great financial, organizational and logistic PFP effort, so that school meals could continue to reach the children and the staff employed in the sector could remain in service. These experiences will certainly need to be investigated further but, as of now, they represent a model of intervention in future crises.

The Italian school catering system made its voice heard only when Italian schools reopened, defining the measures that had to be adopted to counter the spread of the virus.

From the examination of some guidelines available online [128–130], it emerges that the changes proposed revolve around the following aspects:

- to facilitate distancing during the meal, children can eat in the classroom, on other convenient school premises or in the refectory, but in shifts;
- to facilitate the distribution and consumption of meals, it is possible to use individual portions of food packed separately, single-dose packs of dressing, bread, water and fruit, disposable crockery, cutlery, tablecloths and napkins.
- to facilitate the service, it is possible to simplify the menus;
- to avoid unnecessary interpersonal contact, checks on the quality of the service by the parents (through the school canteen committee) are suspended.

These changes have a negative impact on the health and well-being of children and on the educational value of the school meal. One of the consequences is the production of more waste from disposable tableware and packaging of single portions. Also, the quality of the meals worsens due to simplification of the menus to contain costs and facilitate preparation, distribution and consumption (for example, soups are difficult to serve to classes on the upper floors of schools). The solution adopted in some canteens of serving the first course, second course and side serving on the same plate makes it easier for the children to eat only what they like best, with harmful consequences in terms of correct intake of nutrients, food waste, educational value, etc.

The need to maintain the correct temperature of the food until it is served and the fact that single portions tend to cool down quickly leads to a deterioration of the organoleptic characteristics of foods in heat-sealed single portions (for example, overcooked or very dry pasta).

The consumption of the meal in the classroom, on the other hand, involves positive changes at lunchtime, e.g., reduction in the noise typical of refectories, greater sharing between children and teachers, the opportunity for the children to be involved in the preparatory and post-meal activities (setting and clearing the table).

It is too early to draw any conclusions on the Italian measures and only in the future will it be possible to understand the consequences of these changes on the 2 million daily meals consumed in Italian schools [130]. Yet, the complex set of functions that the school canteen has been tasked to perform by Italy's public policies seems to clash with the absolute carelessness with which this system was suspended for months, after schools were closed due to the pandemic, while in the rest of the world solutions were found to continue bringing school meals to children and young people.

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