# The effect of social norms on parents' beliefs and food choices Evidence from a Lab-in-the-Field Experiment

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# The Effect of Social Norms on Parents' Beliefs and Food Choices: Evidence from a Lab-in-the-Field Experiment

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**Abstract**

In a lab-in-the-field experiment, we investigate the influence of social norms on 300 parents' beliefs regarding the nutritional quality of food items and their subsequent food choices. We use a $3 \times 2$ between-subject experimental design where we vary two factors: 1-the social norm provided to parents: a *descriptive norm* (what other parents choose) vs. an *injunctive norm* (what other parents approve of), and 2-the recipient of the food decisions made by parents: their own child vs. an unknown child. Parents participate in a two-stage process. In the first stage, we elicit their beliefs regarding the nutritional quality of various food items and ask them to make a food basket without specific information. In the second stage, based on their assigned treatment, they receive specific information and repeat the belief elicitation and the food basket selection tasks. We find that only the *descriptive norm* significantly reduces parents' overestimation rate of items' nutritional quality. *Injunctive norm* significantly improves the nutritional quality of both, the parent's and child's baskets. *Descriptive norm* significantly improves the nutritional quality of child's baskets only when parents are choosing for unknown child.

**JEL classification: C93, D12, D91**

***Keywords***: *social norms, information provision, food choices, food beliefs, parent, child*

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# 1 Introduction

Dietary intake has a significant impact on individuals' future health. Unhealthy diets are considered the primary cause of the rise in obesity and overweight. Unhealthy consumption is associated with an increased risk of childhood obesity (Ludwig et al., 2001; Malik et al., 2006). Evidence on the links between diet and health indicates that dietary patterns play a key role in reducing the risk of many chronic diseases (Schulze and Hu, 2002; Shi et al., 2019). It has been shown that improvements in diet quality are associated with lower weight gain over several years (Fung et al., 2015). In addition to their adverse effects on health and quality of life, obesity has a substantial economic burden in both developed and developing countries (Tremmel et al., 2017). Okunogbe et al. (2022) estimate, on average, the direct and indirect costs of overweight and obesity in 2019, at 2.19% of the global Gross Domestic Product of 161 countries. d'Errico et al. (2022) find that the total costs attributable to obesity in Italy amounted to €13.34 billion in 2020. Both the health and economic consequences of obesity make it a public health challenge worldwide. With the escalating predominance of childhood obesity, policymakers are implementing initiatives to improve children's diets, particularly within the school environment. For example, France's 2004 public health law prohibits the installation of vending machines selling drinks or processed foods in schools. One more recent example is the promotion from the European Union School Fruit, Vegetables and Milk scheme in France's national food program 2019-2023.[1] The objectives of this program are, among others, to make lasting changes in dietary patterns, promote healthier eating habits from early childhood, and diversify diets by familiarizing children with less commonly consumed products.

Nevertheless, parents also play a crucial role in combating childhood obesity and overweight. They are primarily responsible for the family's food choices, and a large part of the food products consumed by children comes from the family environment. For instance, Feunekes et al. (1998) identify a notable similarity in habitual fat and food intake

[1] France's national food program - The regions in action report - 2019-2023. https://agriculture.gouv.fr/programme-national-pour-lalimentation-2019-2023-territoires-en-action.

between parents and their adolescent children. In a randomized field experiment involving two treatments aiming at changing the content or the frequency of food intakes, Belot et al. (2024) find evidence of significant, sustained changes in children's BMI (z-score). According to the authors, a plausible mechanism behind this change is that the treatments affected the purchasing behavior of parents, who were less likely to purchase unhealthy items and foods high in sugar, in particular, probably leading their children to eat less sugary foods. Hence, understanding the determinants of parents' food choices is essential for promoting healthier eating habits within families. This knowledge is pivotal in addressing childhood obesity and overweight issues. Parents' decisions regarding food are not strictly rational; instead, they are often shaped by prevailing social norms. The social context significantly influences parents' food choices, and their perceptions of others' choices play a crucial role in shaping their own preferences and assessments of the nutritional value of food items. Consequently, interventions to promote healthier eating habits should consider the influential role of information and social norms in parents' food decision-making.

The purpose of this paper is twofold. First, we aim to explore the impact of two types of information - a *descriptive norm* and an *injunctive norm* - on parents' beliefs regarding the nutritional quality of food. Second, we examine how these two types of information shape parents' food choices for themselves, their children, and an unknown child. To do so, we conduct a lab-in-the-field experiment at the "Cité des sciences et de l'industrie"[2], a science museum in Paris. Our experiment involves the participation of 300 parents, each having at least one child aged between 3 and 10 years old. Participants have to decide on two tasks twice: 1- assigning a food quality index, namely the "NUTRI-SCORE"[3], to different food items displayed on their screen and 2- selecting a basket of four items for both themselves and a child.

Our experiment consists of a 3x2 between-subject design where parents decide on the

[2] https://www.cite-sciences.fr/fr/accueil

[3] The "NUTRI-SCORE" is a five-level nutrition labeling system, ranging from A to E and from green to red, placed on the front of food packaging, based on the nutritional value of a food product (see Figure A1 ).

two aforementioned tasks and where we vary two factors. The first dimension of the treatments is based on the type of the provided information: The control group involves no information, and the first treatment group consists of the disclosure of a *descriptive norm* (what others do) to participants, and the second treatment group receives an *injunctive norm* (what others approve of). The second dimension of the design relies on the recipient of the food choice. Parents simultaneously make one set of food decisions for themselves and another for their own child or an unknown child, depending on their randomly assigned treatment group. By incorporating the dimension of choosing for an unknown child, we consider parents' food choices for children as a function of parental distance.

Our findings indicate that *descriptive norm* significantly reduce parents' tendency to overestimate the nutritional quality of food items, while *injunctive norm* information has no significant impact on their beliefs. Furthermore, we find that both *descriptive norm* and *injunctive norm* significantly improve the nutritional quality of parents' food baskets with the effect of *descriptive norm* being more pronounced. Interestingly, *injunctive norm* also has a significant and positive impact on the nutritional quality of the child's food baskets. In contrast, we do not find significant effects of *descriptive norm* on the nutritional quality of the child's food baskets. Moreover, our analysis reveals that parents tend to select food baskets with lower nutritional quality for their children than for themselves. However, there is no significant difference in the nutritional quality of baskets selected for their own children compared to those chosen for unknown children. Additionally, we find that parents generally underestimate the nutritional quality of food, i.e. they believe that food items have a lower nutritional quality than their actual quality.

The paper is structured as follows: Section 2 presents a literature review. The experimental design is described in section 3. Section 4 presents an overview of the analysis methods of the data. Section 5 provides the results, and Section 7 concludes.

# 2 Literature review

## 2.1 Information provision and social comparison

Information framed as social norms can have an impact on eating behaviors. According to Paluck et al. (2010), "a social norm is a perception of where a social group is or where the social group ought to be on some dimension of attitude or behavior". The social norms literature distinguishes two types of social norms: injunctive norm and descriptive norm (Cialdini et al., 1991; Paluck et al., 2010; Bonan et al., 2020). The injunctive norm refers to what most members of a group approve or disapprove while the descriptive norm refers to what most members of a group do or do not do. Parents' food choices may be influenced by the choices of other parents with whom they interact. The actions of others around you, as well as their opinions regarding appropriate actions, can influence people's decisions and actions. It is now well documented that there are conformity effects in eating behaviors. Hogreve et al. (2021) show that a social norm designed to set a new healthy norm increases parents' healthy choices. Gonçalves et al. (2021) find that a social norm nudge designed to increase the purchase of fruit and vegetables in a supermarket context positively affects those with less healthy purchasing habits. James (2004) explores the factors shaping food choices, dietary intake, and nutrition-related attitudes among African Americans. The study reveals a prevailing perception that adopting a 'healthy' diet involves relinquishing part of the cultural heritage to align with the dominant culture. Conformity in eating habits may depend on how similar an individual's eating habits are to the reference provided in the information they receive. Individuals are more likely to adopt a diet if it is similar to their current eating habits rather than requiring a radical change. Studies on information feedback with social comparisons in other areas suggest that the influence of social comparison on individuals' behavior depends on how close their own behavior is to the reference point. Callery et al. (2021) examine the degree to which an individual's proximity to the norm influences their electricity conservation behavior. They find that individuals whose initial behavior is closer to the norm are more

likely to adjust their behavior to match the norm than those whose initial behavior is further from the norm. Information provision can also have an impact on people's beliefs. People may use the provided information to update their beliefs. Vlasceanu and Coman (2022) find that providing a social norm has an impact on health-related belief updating.

Variations in the types of information provided can result in different effects on human behavior. The extent to which individuals respond to a particular message can depend on its presentation. Stok et al. (2014) find that a descriptive norm positively affects fruit intake among adolescents, although an injunctive norm does not and causes a decrease in fruit intake intentions. Mollen et al. (2013) find that the descriptive norm leads to more healthy food choices, but the injunctive norm does not have a significant effect on healthy food choices. Robinson et al. (2014) compare the effect of a message containing health-related information (information about the benefits of vegetables on health), a descriptive norm (information about what others are eating), and an injunctive norm (information about what others approve of) on fruit and vegetable selection and intake. They find that exposure to a descriptive norm message results in significantly more fruit and vegetable selection and consumption than exposure to health-related information, although there is no effect of the injunctive norm message.

Our paper contributes to the literature on the potentially different effects that different types of social norms can have on individuals' decisions (Bonan et al., 2020; Mollen et al., 2013; Stok et al., 2014). These previous studies suggest that the descriptive norm has more influence than the injunctive norm on people's own decisions. However, our study extends this research by examining how social norms affect both individuals' own decisions and the decisions they make for others. Our findings highlight that disclosing what others do (*descriptive norm*) has a more significant influence on one's own decisions, whereas disclosing what others approve (*injunctive norm*) has a greater influence on decisions made for others. Additionally, we examine its impact on beliefs about nutritional quality.

## 2.2 Choosing for themselves and for others

A growing body of research suggests that people make different decisions when acting on behalf of others compared to themselves (Zikmund-Fisher et al., 2006; Polman, 2012). Individuals tend to be more attentive to information when selecting for others than for personal decisions (Jonas et al., 2005; Polman, 2010). For instance, Liu et al. (2018) explore the connection between choice-making and information gathering, showing that individuals consider more alternatives and attributes when deciding for others.

Parents typically take the lead in making food decisions for the family, including choices on behalf of their children. Hence, the nutritional value of the selected foods for their children is influenced by the quantity and nature of the information they take into account during the decision-making process. Children's low acceptance of healthy food and their preferences for high-sugar and/or high-fat foods may lead parents to choose unhealthy products for their children in order to immediately satisfy their preferences (Cooke and Wardle, 2005). Marette et al. (2016) conduct an experiment in which mothers and their child separately choose, for themselves and the other person of the dyad, between relatively healthy foods (flasks of stewed apples) and relatively unhealthy foods (candy bars) to study the effect of a simple nutritional message on vitamins and sugar contents of foods on their food choices. Their results indicate that before disclosing the nutritional message, mothers choose, on average, a lower number of relatively healthy foods for their child than the one they choose for themselves, thus showing "indulgence". The level of parental "indulgence" may also depend on the parental distance from the child for whom the choice is made. Candelo et al. (2018) and Bechler et al. (2015) show that in ultimatum and dictator games, the share of proposals from the first player decreases as social distance increases.

We also contribute to the literature on food choices made by parents for children. In our experiment, we examine how parents' food choices for children vary as a function of parental distance. In other words, we investigate whether the nutritional quality of the food items chosen by parents differs depending on whether the choice is made for

their own child or for an unknown child. To the best of our knowledge, this is the first experiment that introduces the notion of parental distance into the study of parents' food choices for children.

# 3 The Experiment

The experiment consists of a 3 $\times$ 2 between-subjects experimental design, where participants decide on two main tasks. The first task is the Belief elicitation task, where participants are asked to assign a "NUTRI-SCORE" to a list of 15 food items (incentivized belief elicitation task). The second task is the Basket composition, in which participants choose a hypothetical basket of 4 items among the same list of 15 food items (see figure A2 in the Appendix). Each treatment has two stages, hence each task (task 1 and 2 explained below) is repeated twice (stage 1 and 2), meaning that the participants perform both tasks at each stage. We have a total of 6 treatments in which we vary: 1- the social norm provided in stage 2 (two types of social norm and a control group), and 2- the child who is the recipient of the basket composed by parents (see below for more details).

## 3.1 Experimental Tasks

**Task 1 - Belief elicitation task: assigning a "NUTRI-SCORE"**

Several belief elicitation methods exist in the literature, including proper scoring rules such as the Quadratic Scoring Rule (QSR) (Brier, 1950; Savage, 1971) and the Most Likely Interval rule (Schlag and van der Weele, 2015). While these methods are theoretically well-founded, they often involve abstract probability concepts or complex reasoning that can be difficult to implement in field settings, especially when working with a general population. In our setting, the benchmark was the objectively measured nutritional score of each food item ("NUTRI-SCORE"). Then, we elicit participants' beliefs about the nutritional quality of food items by adapting the Most Likely Interval elicitation rule. We opt for a simpler and more intuitive method tailored to the local context and partic-

ipants' familiarity with the subject matter. Participants were asked to state their beliefs about the nutritional quality of food items using the "NUTRI-SCORE", a labeling scheme already visible on many food packages and widely recognized by consumers. To incentivize accurate responses, we offer a reward only if their stated score exactly matches the actual "NUTRI-SCORE" of the food item. This method has several practical advantages: it is easy to explain, requires minimal training for both participants and field staff, and places a low cognitive burden on respondents. Its simplicity also reduces implementation errors and improves data quality. Even if the "NUTRI-SCORE" is not without criticism (Besancon et al., 2023), the aim of this paper is beyond analyzing the effectiveness of the "NUTRI-SCORE" on improving healthy consumption. We simply use the "NUTRI-SCORE" which is a popular score in France, as a tool to measure parents' beliefs on food nutritional quality, and to select a balanced list of the 15 items, by choosing 3 items of each "NUTRI-SCORE" level.

Parents have to assign a "NUTRI-SCORE" to each food item from the aforementioned list of 15 food items based on their beliefs about its nutritional quality (see Figure A4 in the Appendix)[4]. We intentionally concealed the "NUTRI-SCORE" labels and randomized the display order of food items both between and within subjects. The elicitation of beliefs through the attribution of the "NUTRI-SCORE" is incentive-compatible. Participants are explicitly informed that they earn €0.30 for each correct "NUTRI-SCORE" assignment to a product. This means that, by accurately assigning the "NUTRI-SCORE" to all 15 items in both stages, participants can earn up to €9.

[4]Prior to assigning a "NUTRI-SCORE" parents are asked if they know about the "NUTRI-SCORE" with the following question: "Do you know the "NUTRI-SCORE" (image below) or have you ever heard about it? Participants also receive this explanation about the "NUTRI-SCORE": "NUTRI-SCORE" is a five-level nutritional labeling system, ranging from A to E and from green to red, based on the nutritional value of a food item.

**Task 2 - Basket composition**

Parents make hypothetical baskets composed of four items selected from the fifteen-item list[5]. In total, participants are asked to make those choices twice for themselves and twice for either their child (henceforth "*mykid*") or an unknown child (henceforth, "*otherkid*"), depending on the treatment group to which they have been randomly allocated.

## 3.2 Selection of the 15 food items

All participants, across treatments, are presented with an identical list of 15 (nonperishable) food items, which includes 5 savory snacks, 5 sweet snacks, and 5 beverages[6]. The selection of items ensures an equal representation of each possible "NUTRI-SCORE" (from category A to E) with 3 food items for each category: Three items that have a "NUTRI-SCORE" A, three items with a "NUTRI-SCORE" B, and so on. For the sake of consistency, the food items share the same unit price at the time of the study[7]. Since the "NUTRI-SCORE" on food packaging is not mandatory, we were limited to selecting products that display it.

Moreover, we selected the food items to ensure that they could both meet adults' and children's preferences and align with the usual snack habits of French adults and children. Pastries, milk, fruit juices, sweets, fruit, ice cream, and non-alcoholic soft drinks are typical snacks for children and teenagers aged from 0 to 17 (Anses, 2017[8]).

[5]We were not able to provide any actual food item to the participants for logistic reasons. During each step of the basket composition task, participants were instructed to 'make choices as they would in a real shopping scenario'.

[6]Our initial plan for this project was to run a lab experiment and actually provide the selected food items to the participants. Therefore, the selected food items needed to be non-perishable so they could be stored in the lab. Unfortunately, we were unable to conduct these sessions due to the difficulty in attracting parents to come to the lab. Consequently, we decided to redesign our experiment to move the sessions to the field with the inconvenience of not being able to actually give the products to parents. Nevertheless, we kept the same food items list since data collection for designing the *injunctive norm* had already been conducted with this list.

[7]Even though our experiment does not deal with prices, since prices are not shown to participants, the quantities of the food items that are displayed have equivalent prices.

[8]https://www.anses.fr/sites/default/files/NUT2014SA0234Ra.pdf

## 3.3 Experimental Treatments

**Control groups:**

- Control group and decision for "*mykid*" (henceforth **Control_mykid**): In the current treatment, parents' beliefs are elicited, and they are asked to make a 4-item food basket for themselves and another for their own child in stage 1 (henceforth, Basket stage 1) and stage 2 (henceforth, Basket stage 2), hence repeating those two decisions twice. No information is provided between the two stages.

- Control group and decision for "*otherkid*" (henceforth **Control_otherkid**): In the current treatment, parents' beliefs are elicited, and they are asked to make a 4-item food basket for themselves and for an unknown child in stage 1 (Basket stage 1) and stage 2 (Basket stage 2), hence repeating those two decisions twice. No information is provided between the two stages.

The two aforementioned control groups have two objectives: first, as a baseline for comparing subsequent treatments, and second, to use the responses from parents to generate the information provided in the *descriptive norm* treatment groups.

**Descriptive Norm treatments:**

- Descriptive norm and decision for "*mykid*" (denoted by **Descriptive_mykid** treatment): In the current treatment, parents' beliefs are elicited, and they are asked to make a 4-item food basket for themselves and another 4-item food basket for their child (Basket stage 1). In stage 2, parents are provided with the information on a *descriptive norm* and have to repeat the tasks: belief elicitation and making the second choice of basket for themselves and for their child (Basket stage 2).

- Descriptive norm and decision for "*otherkid*" (denoted by **Descriptive_otherkid** treatment): this treatment replicates the features of treatment **Descriptive_mykid** with the difference that parents make in each stage a 4-item food basket for them-

selves and a 4-item food basket for an unknown child, as opposed to their own child.

To compute the *descriptive norm*, we use the data from the control groups' sessions. For each food item, we compute the proportion of parents selecting each of the 15 food items. Consequently, in the second stage, information is displayed next to each food item in the following way: "For a good nutritional quality diet, X% of adults chose this item for their own consumption" (see Figure A5 in the Appendix for a screenshot). When they are asked to make a 4-item food basket for their child the second time, the following information is displayed next to each food item: "For a good nutritional quality diet, X% of parents chose this item for children" (see Figure A6 in the Appendix for a screenshot).

**Injunctive norm treatments:**

- Injunctive norm and decision for "*mykid*" (denoted by treatment **Injunctive_mykid**): In stage 1, parents make a 4-item food basket for themselves and another 4-item food basket for their child (Basket stage 1). In stage 2, participants are provided with an *injunctive norm* and have to repeat the task by making their second choice of basket for themselves and for their child (Basket stage 2).

- Injunctive norm and decision for "*otherkid*" (denoted by **Injunctive_otherkid** treatment): this treatment replicates the features of treatment **Injunctive_mykid** with the difference that parents make in each stage a 4-item food basket for themselves and a 4-item food basket for an unknown child, as opposed to their own child.

Before running the experimental sessions, we conducted two surveys[9] (an online survey and a field survey) to generate the *injunctive norm* that would be displayed on the screens during the basket making. The first survey aimed at eliciting parents' opinions about a child's diet. More precisely, we sent an online questionnaire to 48 parents who

[9]Data from the two surveys were used solely to construct the injunctive norm (i.e., the food choices parents believe should be made for themselves or children). These survey responses were not analyzed independently nor compared directly with the choices of experimental participants.

have a child between 3 and 10 years old. For each of the 15 food items that we use in the experiment, parents had to answer yes or no to the following question: "In order to propose a good nutritional quality diet to their child(ren), do you think that parents should choose the product below?". The share of parents who answered yes for each item was used in the *injunctive norm* treatment when parents are asked to make a second basket for their or another child (basket stage 2). The second survey was aimed at eliciting adults' opinions about an adult's diet. We conducted a field survey (in a park and in the financial district close to a supermarket, near the university) before the experiment, to which 50 adults responded on tablets. For each of the 15 food items, adults had to answer yes or no to the following question "For a good nutritional quality diet, do you think that adults should choose the item below for themselves?" The share of adults who answered "yes" for each item is used as a piece of information displayed in the *injunctive norm* treatment sessions when parents are asked to make their own basket for the second stage (basket stage 2).

Hence, during the *injunctive norm* treatment sessions, the following information is displayed next to each food item when parents are asked to make their own basket choices in the second stage "X% of adults think that for a good nutritional quality diet, adults should choose this item for their own consumption" (see Figure A7). When they are asked to make a basket for children in the second stage, they see the following information next to each food item: "X% of parents think that for a good nutritional quality diet, parents should choose this item for children" (figure A8).

**Summary:**

Table 1 summarizes the 6 treatment groups of our experiment and the corresponding sample size. Participants are randomly assigned to one of the 6 groups.

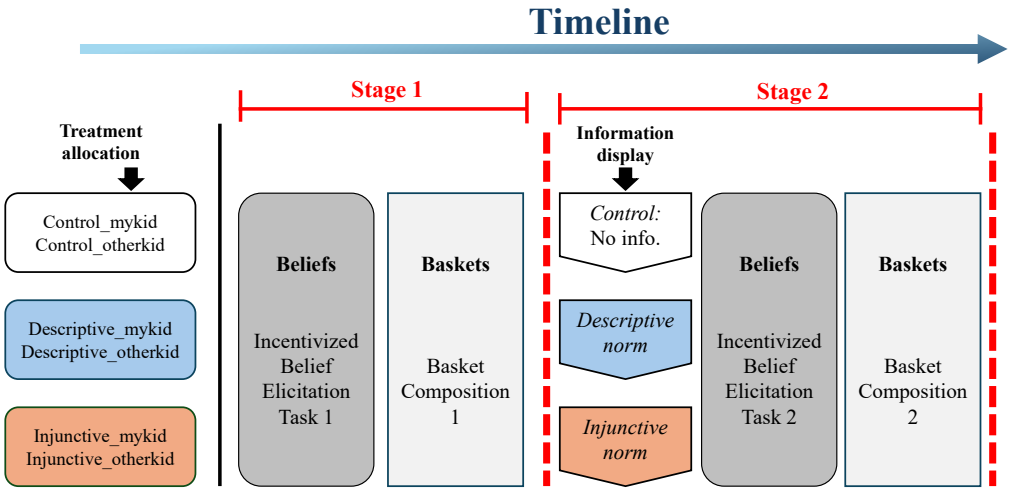
At the very end of the experiment, after completing the two main tasks, participants are asked to fill in a survey about their risk and time preferences (10-point Likert scales), socio-demographics, and eating habits (type of diet, snacking habits, grocery shopping

Table 1: Summary of treatments

| | **Control groups** | **Descriptive norm** | **Injunctive norm** |
|---|---|---|---|
| ***mykid*** | Control_mykid (N=51) | Descriptive_mykid (N=50) | Injunctive_mykid (N=50) |
| ***otherkid*** | Control_otherkid (N=48) | Descriptive_otherkid (N=50) | Injunctive_otherkid (N=51) |

habits etc...) (see Tables A2 and A3 in the Appendix for descriptives statistics on those variables). Figure 1 shows the overall timeline of the experiment.

Figure 1: Experiment timeline.




## 3.4 Hypotheses

The literature on food choices made by parents for themselves and their children highlights that parents often select items of lower nutritional quality for their children compared to what they choose for themselves (Marette et al., 2016). Based on this finding, we formulate our first hypothesis:

**Hypothesis 1.** *Parents will choose food items with lower nutritional quality for their child than for themselves.*

Hypothesis 2 can be framed in two opposing ways. On one hand, parents might make

healthier food choices for other children than for their own. This perspective assumes that parents are motivated by a desire to delight their own children by selecting less healthy food items that align with their preferences. In contrast, when choosing food for other children whose preferences are unknown, parents may prioritize the nutritional quality of the items over the potential to please.

On the other hand, evidence from research on sharing behavior suggests that people are more generous toward those who are socially closer to them (Candelo et al., 2018; Bechler et al., 2015). Applying this to the context of food choices, parents may opt for less nutritious items to satisfy their own children's preferences. For an unfamiliar child, however, the lack of information about their likes and dislikes might reduce the parents' inclination to prioritize preference-driven choices, potentially leading to healthier selections.

**Hypothesis 2.** *Parents will make healthier choices for other children compared to their children.*

Studies on promoting healthy eating through social norms suggest that descriptive norms have a more significant impact on people's eating behaviors than injunctive norms (Stok et al., 2014; Robinson et al., 2014; Mollen et al., 2013). Consequently, we anticipate that the descriptive norm will exert a stronger influence on parents' beliefs and food choices compared to the injunctive norm. In other words, the descriptive norm makes parents more accurate in their beliefs and has a positive effect on improving healthy choices, whereas the injunctive norm does not affect parents' beliefs and food choices.

**Hypothesis 3.** *Descriptive norm will have more impact on parents' beliefs on nutritional quality of food items and food choices than parents' opinion.*[10]

[10]By *parents' opinion*, we refer to the injunctive norm in the sense of Robinson et al. (2014) and Mollen et al. (2013). We had already pre-registered the experiment using the term *parents' opinion*, so we maintain the hypothesis as it is in the pre-registration.

## 3.5 Participants

Our sample consists of 300 parents with child(ren) aged from 3 to 10 years who came to visit the museum (see Appendix C for a description of power calculations and sample size determination). The decision to limit the maximum age of participants' children to 10 years is driven by our focus on investigating food choices within the family environment. By including children aged up to 10, a stage predating adolescence, we aim to capture a period in which parents predominantly influence their children's dietary habits. At this developmental stage, parents typically play a significant role in providing and controlling the food consumed by their children outside the school environment. Kasparian et al. (2017) study parenting practices and decision-making at restaurants versus at home. They find that a majority of mothers report preparing dinner at home three to five times each week and eating together with their children (5 to 8 years old). Additionally, they find that mothers who eat out with their children generally choose their child's food menu. Beyond this age, children enter adolescence and tend to experience more peer effects in their eating behaviors (Fortin and Yazbeck, 2011). During adolescence, parents have less control over their children's diets when they eat out. In fact, Fortin and Yazbeck (2011) find that parents are absent 38% of the stages during the consumption of evening meals of their teenagers (7th to 12th grade ) and that 83% of adolescents have the freedom to choose their meals.

## 3.6 Procedures

We run a lab-in-the-field experiment (Harrison and List, 2004) at the Parisian science museum "La Cité des Sciences et de l'Industrie" during the weekend of the science festival[11] and the 2 following weekends, in October 2022 (5 days in total). This museum appeared to be an efficient field to include parents with children aged 3 to 10 years old, compared to a regular experimental laboratory participants' database. We had a meeting with the coor-

[11]The science festival is an annual French scientific culture event that takes place over ten days in October in Metropolitan France.

dinator of the mediation program of the "Cité des Sciences et de l'Industrie," who agreed to host the project on their premises. Information about the experiment was published on the museum's website before the start of the experiment, and posters were displayed at various locations within the museum during the experiment. The experimental team stands at several areas in the museum with the information of the experiment to inform potential participants. Participation was fully voluntary.

During the science festival, admission is free, which is not typically the case. We chose to conduct our sessions during the festival for two reasons. First, it allows us to obtain a more heterogeneous sample in terms of socio-economic status, as free museum entry is likely to attract a broader range of visitors[12]. Usually, admission fees to the museum are €13 for the full price, €10 for under 25 years and over 65 years old, €3.50 for children aged 2 to 5 (only for the exhibition ticket), and free for under 2 years old.

The setting is the following: a mobile lab is set up in one of the museum's rooms with tablets on which the participants answer directly (see Figure A3 in the Appendix). Tables are arranged to minimize communication during the experiment between participants from different families.

Every day, time slots of two hours were scheduled and corresponded to one treatment group. Treatments were randomized within a day. Participants are assigned to the corresponding treatment according to the time slot they show up to (see Table A4 in the Appendix for the exact schedule). To guarantee anonymity, each participant is given a five-digit code as a personal identification number.

On average, participants earned €6, which includes a show-up fee of €3. The average time to complete the questionnaire was 16 minutes.

The experiment was developed with Limesurvey GMBH[13]. The experiment was pre-registered on AsPredicted #98336 (https://aspredicted.org/WSC_QDF). and

[12]Table A1 in the Appendix shows a comparative table of descriptive statistics showing that participants who came during the science festival have a significantly lower income than participants who came during the other sessions.

[13]Limesurvey GMBH. / LimeSurvey: An Open Source survey tool /LimeSurvey GmbH, Hamburg, Germany. http://www.limesurvey.org.

got ethical approval N° 2022-06-02 from the research ethics committee of the University of Paris Nanterre[14].

# 4 Analysis methods

## 4.1 Beliefs measures

We build 4 different measures to investigate how beliefs change between the first and second stages, based on the different treatments. Note that the "NUTRI-SCORE" is coded such that $A = 1$, $B = 2$, $C = 3$, $D = 4$ and $E = 5$.

1. *Absolute belief gap* (hereafter *Absolute_belief_gap* ) measures how close parents are to the actual "NUTRI-SCORE". It sums the absolute gaps between the "NUTRI-SCORE" of the item and the belief of the participant for the 15 food items. The values range from 0 to 48. The higher this score, the less accurate the participant's beliefs (0 means the participant is perfectly accurate).

$$Absolute\_belief\_gap_{it} = \sum_{f=1}^{15} |Nutri\_Score_f - Belief_{fit}|$$

   Where $f$, $i$, $t$ denote each food item $f$ for subject $i$ in stage $t = \{1; 2\}$, respectively.

2. *Overestimation rate* (hereafter *Overestimation_rate*) provides the rate of overestimation in the assignment of the "NUTRI-SCORE" among the 15 products. This rate (ranging from 0 to 100) is based on the dummy variable "$overestimate\_ns_f$" which takes the value 1 if the participant overestimates the nutritional quality of food item $f$, i.e. the participant estimates a better "NUTRI-SCORE" in terms of nutritional quality than the actual one, and 0 otherwise. The higher this rate, the

[14]Note that we removed hypothesis 1 in the final version of the manuscript since we realized that it overlaps with registered H2 (now H3).

more the participant thinks that the nutritional quality of the food items is better than their nutritional quality as reflected by their "NUTRI-SCORE".

$$Overestimation\_rate_{it} = \frac{\sum_{f=1}^{15} overestimate\_ns_{fit}}{15} \times 100$$

3. *Underestimation rate* (hereafter *Underestimation_rate*) measures the rate of underestimation in the assignment of the "NUTRI-SCORE" among the 15 products. This measure (ranging from 0 to 100) is based on the dummy variable "$underestimate\_ns_f$" which takes the value 1 if the participant underestimates the nutritional quality of the item, i.e. the participant estimates a worse "NUTRI-SCORE" in terms of nutritional quality than the actual one, and 0 otherwise. The higher this rate, the more the participant believes that the nutritional quality of the food items is lower than their nutritional quality as reflected by their "NUTRI-SCORE".

$$Underestimation\_rate_{it} = \frac{\sum_{f=1}^{15} underestimate\_ns_{fit}}{15} \times 100$$

4. *Accuracy rate* (hereafter *Accuracy_rate*) provides the rate of accurate estimation in the assignment of the "NUTRI-SCORE" among the 15 products. This rate (ranging from 0 to 100) is based on the dummy variable "accurate_ns" which takes the value 1 if the participant assigns the correct "NUTRI-SCORE", and 0 otherwise. The higher this rate, the more accurate the participant's guess of the nutritional quality of the food items compared to their nutritional quality as reflected by their "NUTRI-SCORE".

$$Accuracy\_rate_{it} = \frac{\sum_{f=1}^{15} accurate\_ns_{fit}}{15} \times 100$$

### 4.2 Nutritional quality score

As a measure of the nutritional quality of a food item, we use the Nutrient Profiling Model developed by the UK Food and Standard Agency (FSA score, see Rayner et al. (2009) for details of the score calculation). The model provides a single score for any given food product based on calculating the number of points for 'negative' nutrients (energy, saturated fat, sugar, and sodium) and the number of points for 'positive' nutrients (fiber, fruit, and vegetable content, and proteins). We calculate the aggregated nutritional quality score of each basket following the aggregation method of Crosetto et al. (2020), which adds the FSA score of each item and normalizes by 100 Kilocalories (Kcal). The lower the basket's FSA score, the better the nutritional quality of the basket.

$$FSA_{it} = \frac{\sum_{f=1}^{4} Kcal_{fit} \cdot FSA_{fit}}{\sum_{f=1}^{4} Kcal_{fit}}$$

for each food item $f$, participant $i$ at stage $t = \{1; 2\}$.

## 5 Results

### 5.1 Descriptive statistics

Our sample consists of 300 participants.[15] Table 2 describes the socioeconomic characteristics of the participants broken by treatment groups. We conduct randomization checks to confirm the proper allocation of participants across the different treatment groups using standardized differences (Deaton and Cartwright, 2018; Mutz et al., 2019). Note that the overweight and obesity rate is lower in our sample (39.67%) than in Metropolitan France (47.3% among adults)[16].

[15] 302 participants took part in the experiment, but 2 participants were excluded from the analysis; one deleted observation refers to a participant who had difficulties reading the instructions and understanding them and needed help from the experimenter. The second refers to a participant who let his teenager answer the questions.

[16] Enquête Obépi-Roche, 2020.

Table 2: descriptive statistics

| **Variable** | All | Control mykid (1) | Control otherkid (2) | Descriptive mykid (3) | Descriptive otherkid (4) | Injunctive mykid (5) | Injunctive otherkid (6) |
|---|---|---|---|---|---|---|---|
| Participant's age (mean) | 39.44 | 38.06 | 39.13 | 37.94 | 40.80* | 40.36* | 40.37 |
| Number of children (mean) | 1.58 | 1.59 | 1.73 | 1.56 | 1.46* | 1.58 | 1.57 |
| Age of the oldest child (mean) | 7.72 | 7.00 | 7.85 | 7.58 | 7.50 | 8.16* | 8.26 |
| Number of household member (mean) | 3.90 | 3.78 | 4.15 | 3.72 | 3.80* | 3.84 | 1.19 |
| Nutri-Score reference (%) | 62.00 | 58.82 | 56.25 | 60.00 | 64.00 | 68.00 | 64.71 |
| | | | | | | | |
| Education level | | | | | | | |
| No diploma (%) | 2.00 | 1.96 | 2.08 | 2.00 | 4.00 | 0.00 | 1.96 |
| CAP-BEP (%) | 6.67 | 3.92 | 6.25 | 2.00 | 4.00 | 8.00 | 15.69* |
| High school degree (%) | 15.00 | 17.65 | 14.58 | 18.00 | 6.00* | 18.00 | 15.69 |
| Bachelor's degree (%) | 20.00 | 19.61 | 20. 83 | 24.00 | 16.00 | 14.00 | 25.49 |
| Master's degree (%) | 43.67 | 39.22 | 43.75 | 42.00 | 54.00 | 52.00* | 31.37* |
| PhD (%) | 4.67 | 5.88 | 2.08 | 10.00 | 6.00 | 0.00* | 3.92 |
| Others (%) | 8.00 | 11.76 | 10.42 | 2.00* | 10.00 | 8.00 | 5.88 |
| | | | | | | | |
| Income | | | | | | | |
| Less than 20000 (%) | 11.33 | 11.76 | 16.67 | 6.00 | 8.00* | 10.00 | 15.69 |
| Between 20000 and 25000 (%) | 9.67 | 13.73 | 4.17 | 10.00 | 6.00 | 10.00 | 13.73* |
| Between 25000 and 30000 (%) | 9.67 | 3.92 | 12.50 | 4.00 | 16.00 | 12.00* | 9.80 |
| Between 30000 and 35000 (%) | 4.33 | 5.88 | 8.33 | 2.00 | 8.00 | 0.00* | 1.96* |
| Between 35000 and 42000 (%) | 9.33 | 9.80 | 6.25 | 4.00 | 4.00 | 12.00 | 19.61* |
| Between 42000 and 50000 (%) | 10.33 | 13.73 | 12.50 | 16.00 | 10.00 | 2.00* | 7.84 |
| Between 50000 and 55000 (%) | 5.67 | 1.96 | 4.17 | 6.00 | 6.00 | 10.00* | 5.88 |
| Between 55000 and 65000 (%) | 7.00 | 7.84 | 8.33 | 6.00 | 8.00 | 6.00 | 5.88 |
| Between 65000 and 85000 (%) | 11.67 | 7.84 | 6.25 | 22.00* | 20.00 | 8.00 | 5.88 |
| More than 85000 (%) | 11.00 | 11.76 | 4.17 | 18.00 | 8.00 | 16.00 | 7.84 |
| No answer (%) | 10.00 | 11.76 | 16.67 | 6.00 | 6.00* | 14.00 | 5.88* |
| | | | | | | | |
| Gender | | | | | | | |
| Female (%) | 66.33 | 78.43 | 64.58 | 46.00* | 66.00 | 74.00 | 68.63 |
| Male (%) | 32.33 | 19.61 | 29.17 | 54.00* | 34.00 | 26.00 | 31.37 |
| No answer (%) | 1.33 | 1.96 | 6.25 | 0.00 | 0.00* | 0.00 | 0.00* |
| | | | | | | | |
| Body Mass Index | | | | | | | |
| Underweight (%) | 1.67 | 3.92 | 0.00 | 2.00 | 0.00 | 4.00 | 0.00 |
| Normal weight (%) | 55.67 | 56.86 | 58.33 | 60.00 | 50.00 | 60.00 | 49.02 |
| Overweight and obese (%) | 39.67 | 35.29 | 35.42 | 38.00 | 48.00* | 34.00 | 47.06 |
| No answer (%) | 3.00 | 3.92 | 6.25 | 0.00* | 2.00 | 2.00 | 3.92 |
| N | 300 | 51 | 48 | 50 | 50 | 50 | 51 |

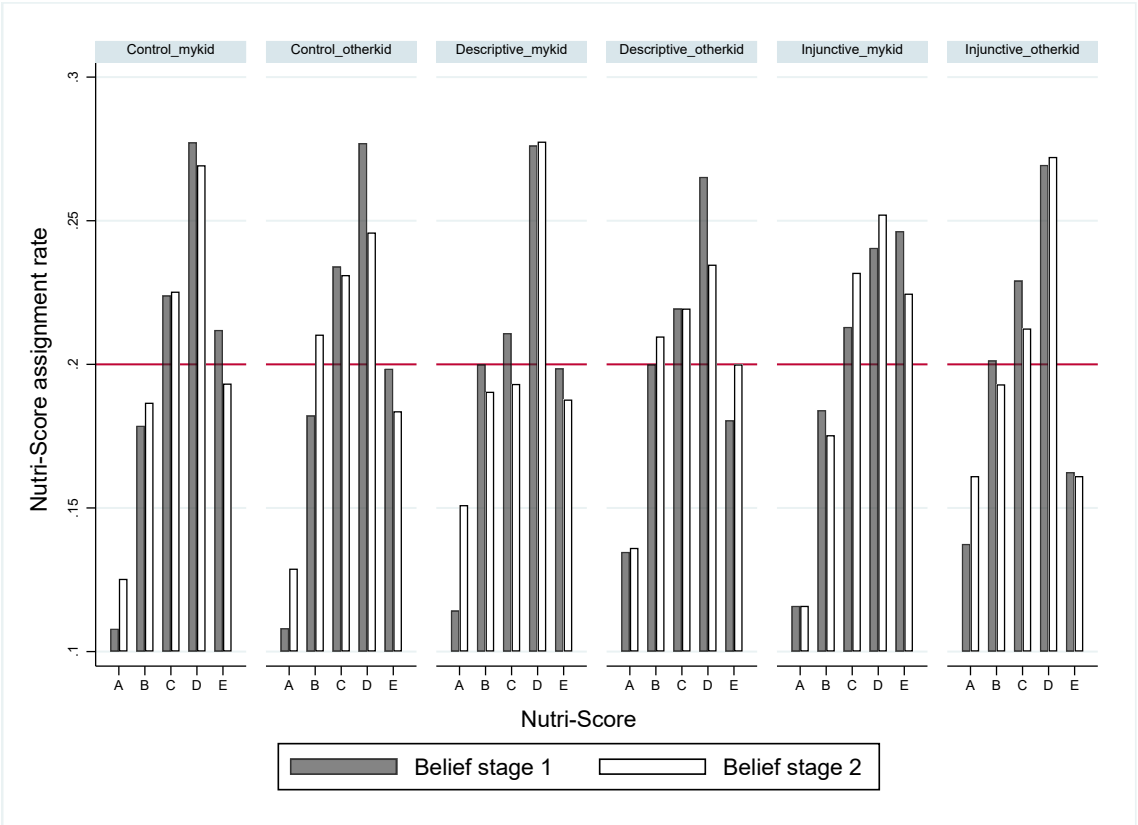
*Notes*: The "CAP" and "BEP" are professional diplomas in the French education system, awarded after secondary school. Body Mass Index (BMI) is calculated using participants' self-reported weight and height.
A star (*) indicates that the standardized difference (Deaton and Cartwright, 2018; Mutz et al., 2019) between the treatment group and the corresponding control group exceeds the significance threshold of 0.25.

## 5.2 Treatment comparisons

*Belief elicitation: "NUTRI-SCORE" assigned by the participants*

Figure 2 displays the distribution of the "NUTRI-SCORE" assigned by the participants for the 15 food items across treatments and at stages 1 (gray bars) and 2 (white bars). As described in Section 3.2, the 15-food items list includes three items for each "NUTRI-SCORE", meaning that perfect accurate beliefs are represented by a rate of 0.2 for each "NUTRI-SCORE" level (represented by the horizontal red line in Figure 2). Nevertheless, we observe that in each treatment group, the distribution is slightly right-skewed with a peak at "NUTRI-SCORE" D, suggesting that participants tend to underestimate the nutritional quality of the food items. A more detailed analysis of belief accuracy is provided in sub-section 5.3.1.

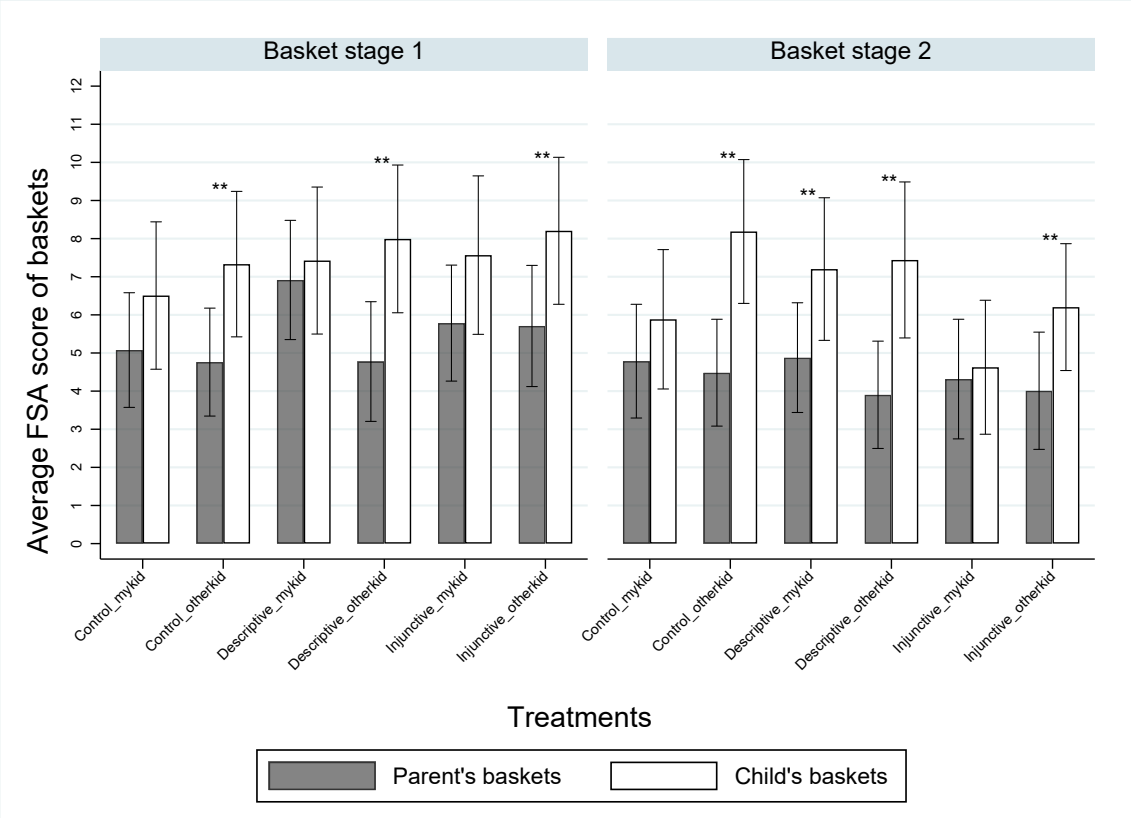
Figure 2: Rate of each "NUTRI-SCORE" assigned to the 15 items by treatment.




*FSA scores*

Figure 3 shows the average FSA score across treatments for basket 1 (on the left-hand side) and basket 2 (on the right-hand side), comparing parents' and children's baskets. Notably, parents' baskets consistently exhibit a lower FSA score than children's baskets. This difference is statistically significant for baskets at stage 1 in treatments Control_otherkid ( p-value = 0.03), Descriptive_otherkid (p-value = 0.01), and Injunctive_otherkid (p-value = 0.05). We observe similar significant differences for baskets at stage 2, including treatment Descriptive_mykid (p-value = 0.05). Overall, parents consistently opt for products with lower nutritional quality for children compared to themselves, aligning with the findings from Marette et al. (2016).

Figure 3: Average FSA score of parent's and child's basket by treatments and control groups.




*Notes*: 95% confidence intervals. The tests of differences in average FSA score between parent's baskets and child's baskets are done with a t-test and the stars above the bars of the histograms indicate if this difference is significant: ** p-value $< 0.05$.

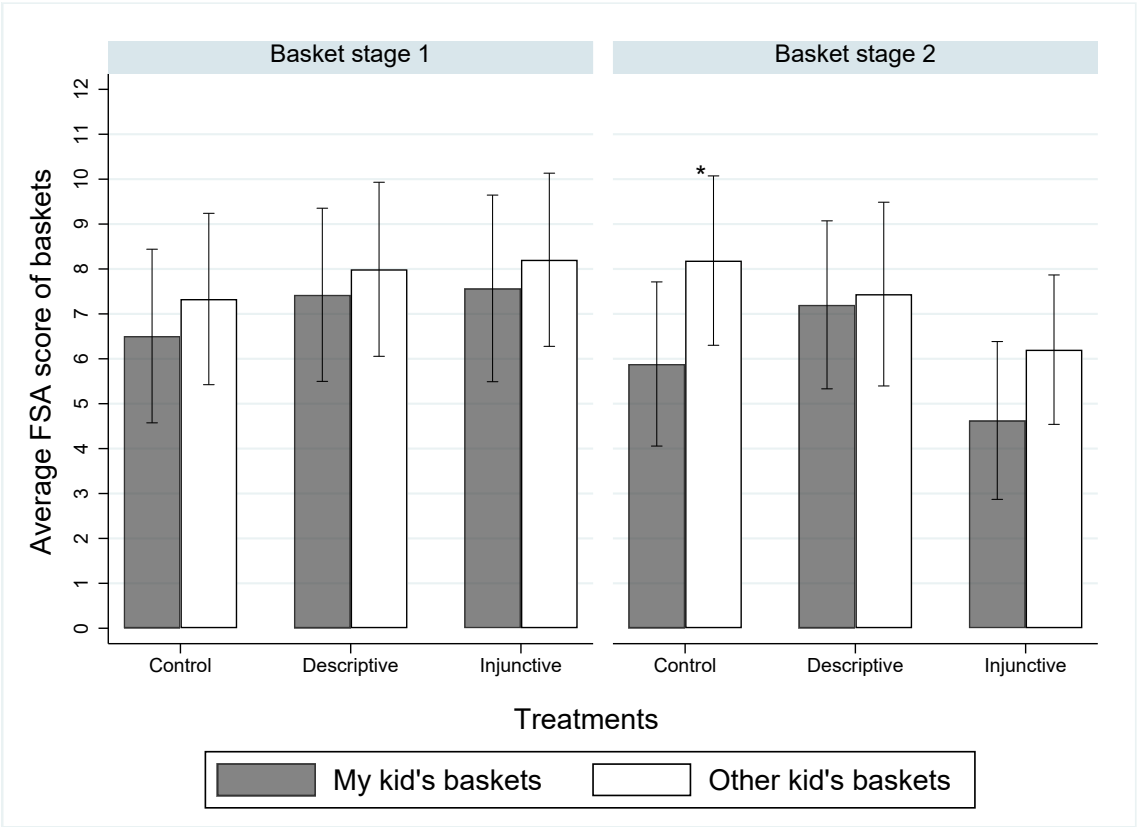
We investigate in Figure 4 whether parents make food choices differently according to the "parental" distance (own child vs. unknown child). We show the average FSA score

across treatments for baskets at stage 1 (on the left-hand side) and for baskets at stage 2 (on the right-hand side), comparing *mykid*'s basket to the *otherkid*'s basket. Overall, we observe that baskets for *mykid* tend to have a lower FSA score than baskets for *otherkid*, although the differences are significant only in the control group (p-value = 0.08) for baskets at stage 2. Therefore, we confirm hypothesis 1 and we reject hypothesis 2:

**Result 1.** *Parents tend to select food baskets with lower nutritional quality for children compared to themselves.*

**Result 2.** *There is no significant difference in the nutritional quality between baskets for their own children and those for other children.*

Figure 4: Average FSA score of child's baskets, my kid vs. other kid



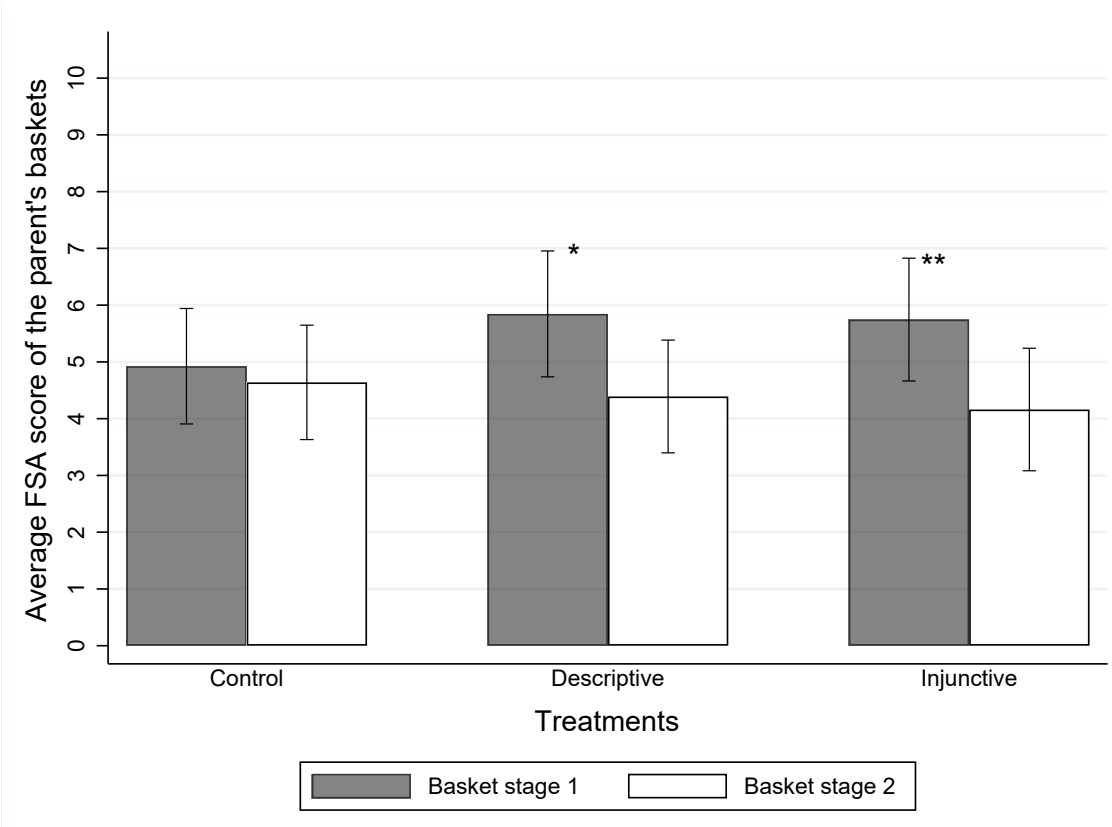

*Notes*: The tests of differences in average FSA between parent's baskets and child's baskets are done with a t-test, and the stars above the bars of the histograms indicate if this difference is significant:
* p-value $< 0.10$.

We perform additional analyses comparing the FSA scores between baskets at stages 1 and 2 for parents and children in Appendix A to look at the treatment effect on baskets'

nutritional qualities. Figure 5 represents the average FSA scores of parents' baskets at stages 1 and 2. In the Control group, we find no significant differences, with an average FSA score of 4.92 and 4.64 for baskets at stages 1 and 2, respectively (p-value = 0.69). However, we find significant differences in the *descriptive norm* treatment, with FSA scores of 5.85 and 4.39 (p-value = 0.05), and in the *injunctive norm* treatments, with FSA scores of 5.75 and 4.16 (p-value = 0.04) for baskets at stages 1 and 2, respectively. We thus observe that providing parents with information on *descriptive norm* and *injunctive norm* significantly improves the nutritional quality of their food baskets.

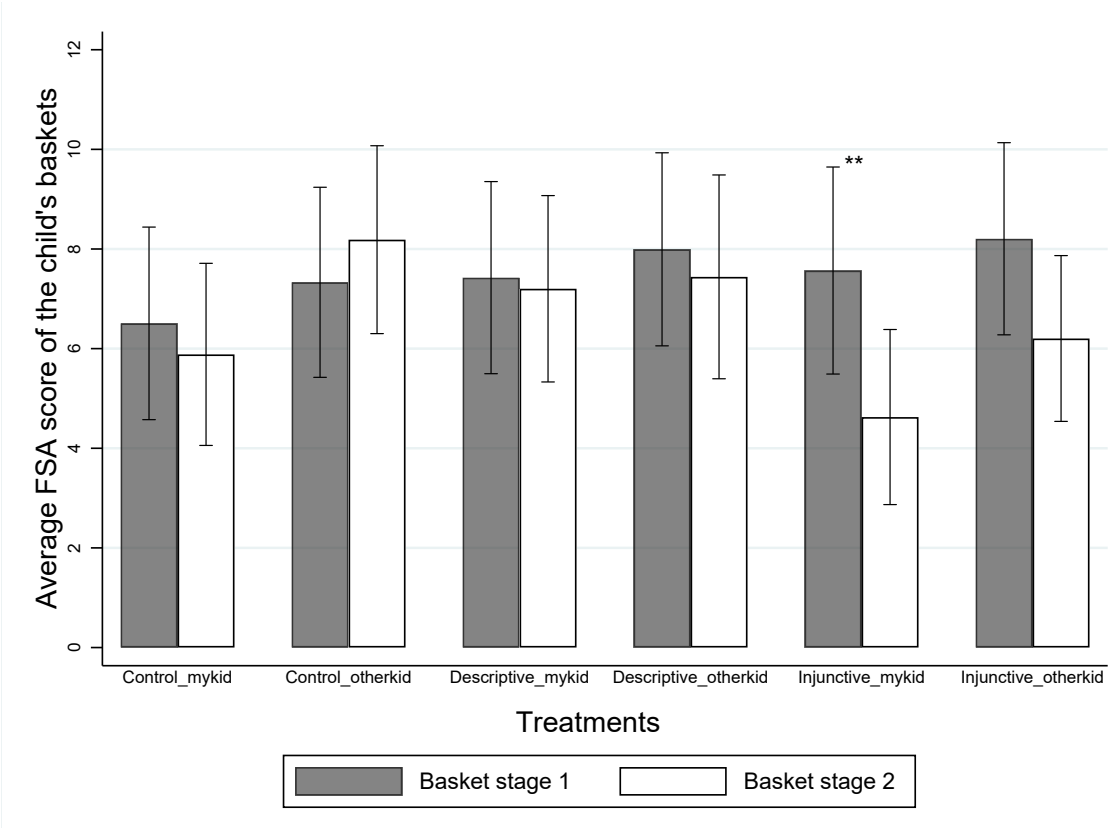
Figure 6 illustrates the average FSA scores of the first and second baskets made by parents for children overall, across treatments. We find no significant differences between treatments, except for Injunctive_mykid, where we observe a significant reduction in the FSA score (p-value = 0.03). This finding suggests that parents' choices for their own children are influenced by other parents' opinions.

Figure 5: Parents' average FSA score by treatment, basket stage 1 vs. basket stage 2.




*Notes*:Two sided t-tests of differences in average FSA score between basket 1 and basket 2.:
* p-value $< 0.10$, ** p-value $< 0.05$.

Figure 6: Children's average FSA score by treatment, basket stage 1 Vs. basket stage 2.




*Notes*: Two sided t-tests of differences in average FSA score between basket 1 and basket 2.
** p-value $< 0.05$.

## 5.3 Econometric analysis

We run difference-in-difference estimations to evaluate the average treatment effect of our treatments on beliefs (see subsection 5.3.1) and the nutritional quality of food baskets (see subsection 5.3.2). The explanatory variables used in the models are the following: *Stage 2* takes value 1 for the second stage, 0 otherwise. We include the interaction terms *Stage 2* $\times$ *Descriptive* for treatments with *descriptive norm* and *Stage 2* $\times$ *Injunctive* for treatments with *injunctive norm*. *Free day* is a dummy variable that takes value 1 if for days for which the museum admission was free, 0 otherwise.[17] *"Nutri-Score" reference* is a dummy variable that takes the value 1 if the parent declared referring to the "Nutri-Score" (when available) when doing food shopping, 0 otherwise. *Female* is a dummy variable

[17] We include this variable to control for possible selection biases.

that takes value 1 for female, and 0 otherwise. For *parent meeting PNNS' recommendations* and *child meeting PNNS' recommendations*, participants complete a questionnaire about their eating habits and those of their child. We use these responses to construct a score indicating whether the participants and their children follow the recommendations of the "Programme National Nutrition santé" (PNNS)[18] for parents and for children. We then subdivide the sample into quartiles based on the score obtained by each individual (parent and child). Individuals in the first quartile have the least PNNS-compliant eating habits, and those in the fourth quartile have the most PNNS-compliant eating habits (See Appendix D for the method used to construct the score of following the recommendations of the PNNS). *Food risk lover* measures participants' willingness to take risks when it comes to food risks. We use an 11-point Likert scale from 0 to 10 (0 = "not willing to take any risks" and 10 = "quite willing to take risks"). *Future food effects* captures participants' consideration of the potential future health effects of their food choices (0 = "I do not consider the possible future effects of food on my health" and 10 = "I take fully consider the possible future effects of food on my health"). We have also a list of socio-demographic variables such as *Number of children*, *Age*, *Income*, *Education level*, *Child age*[19], and *Body Mass Index*[20].

### 5.3.1 Average treatment effect on beliefs

Table 3 provides the results of the difference-in-difference estimation (OLS model with fixed effects) of the belief elicitation on the "NUTRI-SCORE"[21]. Our dependent variables are the *Absolute belief gap* (columns (1) and (2)), *Overestimation rate* (columns (3) and (4)), *Underestimation rate* (columns (5) and (6)), and *Accuracy rate* (columns (7)

[18]The "Programme National Nutrition santé" (PNNS) has overall the aim to improve the state of health of the entire population by acting on one of its major determinants: nutrition.

[19]In case the participant has more than one child, this variable is defined as the age of the oldest child. We assume that parents put more effort into the education of the first child (Kim, 2020; Hotz and Pantano, 2015) .

[20]We use the Body Mass Index classification of the WHO. Our three categories are underweight (BMI $< 18.5$), normal weight ($18.5 \leq$ BMI $< 25$), and overweight and obese (BMI $\geq 25$). Note that it is not mandatory to respond to questions on weight and height.

[21]Given the number of treatments and outcomes, we apply Holm-Bonferroni (Holm, 1979) to correct the p-values associated with our key treatment effects across the belief measures.

and (8)). We find a negative and significant effect of the *descriptive norm* on the overestimation rate (see column (3)), suggesting that *descriptive norm* significantly reduces the overestimation of the nutritional quality of food items compared to the control group, which implies more accurate "NUTRI-SCORE" guesses. Exposure to the descriptive norm reduces the overestimation of the nutritional quality of food items by 2.29 points more in the treatment group compared to the control group. This effect is robust even when controlling for socio-demographic variables (see column (4)). In contrast, we find a positive and significant effect of *injunctive norm* treatment on the absolute belief gap only if we introduce socio-demographic variables (column 2). Table B1 in the appendix shows the results with all control variables.

Our hypothesis 3 is partially confirmed:

**Result 3a.** *The descriptive norm significantly reduces parents' overestimation rate of the nutritional quality of food items, although injunctive norm has no significant effect on parents' beliefs.*

Table 3: Difference-in-difference on belief accuracy with all participants.

| | Absolute belief gap (1) | Absolute belief gap (2) | Overestimation rate (3) | Overestimation rate (4) | Underestimation rate (5) | Underestimation rate (6) | Accuracy rate (7) | Accuracy rate (8) |
|---|---|---|---|---|---|---|---|---|
| Stage 2 | -0.31 | -0.35** | 2.15*** | 2.20*** | -3.16** | -3.22*** | 1.01 | 1.03 |
| | (0.20) | (0.16) | (0.36) | (0.33) | (0.92) | (0.92) | (1.10) | (1.21) |
| Descriptive | 0.00 | 0.49 | 0.00 | 2.54 | 0.00 | -2.46 | 0.00 | -0.07 |
| | (0.00) | (0.37) | (0.00) | (2.67) | (0.00) | (1.77) | (0.00) | (1.97) |
| Injunctive | 0.00 | -0.24 | 0.00 | -0.25 | 0.00 | -1.08 | 0.00 | 1.34* |
| | (0.00) | (0.43) | (0.00) | (0.42) | (0.00) | (1.21) | (0.00) | (0.81) |
| Stage 2 × Descriptive | -0.05 | -0.02 | -2.29** | -2.27*** | 0.90 | 0.93 | 1.39 | 1.33 |
| | (0.16) | (0.18) | (0.52) | (0.57) | (0.90) | (0.97) | (1.23) | (1.18) |
| Stage 2 × Injunctive | 0.25 | 0.26* | -0.97 | -0.77 | 1.71 | 1.66 | -0.75 | -0.89 |
| | (0.13) | (0.13) | (0.59) | (0.64) | (2.21) | (2.21) | (2.40) | (2.69) |
| Constant | 14.50*** | 16.97*** | 26.89*** | 41.51*** | 40.40*** | 27.79*** | 32.71*** | 30.70*** |
| | (0.08) | (0.50) | (0.08) | (8.92) | (0.30) | (4.37) | (0.29) | (4.94) |
| N | 300 | 288 | 300 | 288 | 300 | 288 | 300 | 288 |
| Observations | 600 | 576 | 600 | 576 | 600 | 576 | 600 | 576 |
| Socio-demographic variables | No | Yes | No | Yes | No | Yes | No | Yes |
| Food-related variables | No | Yes | No | Yes | No | Yes | No | Yes |
| Free day | No | Yes | No | Yes | No | Yes | No | Yes |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1), (3), (5) and (7) show the results of an OLS model with fixed effects and columns (2), (4), (6) and (8) the results with random effects.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Socio-demographic variables include gender, age, child age, number of children, Body Mass Index, and education level. Food-related variables include "Nutri-Score" reference, parent meeting PNNS' recommendations, food risk lover, and future food effects. We lose 10 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 6 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height. See Table B1 in the appendix for the whole table. We correct the p-values associated with our key treatment effects on beliefs using the Holm-Bonferroni (Holm, 1979) correction in Table B2 in the appendix.

### 5.3.2 Average treatment effect on baskets' nutritional quality

Table 4 shows the results of an OLS model with fixed effects (column 1) exploring the effect of social norms on the baskets' nutritional quality. We run a difference-in-difference estimation analysis of the FSA score of the parents' baskets. Our dependent variable is the FSA score of the parent's basket. We find negative and significant effects of the *injunctive norm* on the nutritional quality of the parents' basket, confirming our descriptive results: the information provided in the treatments significantly improves the nutritional quality of the parents' basket compared to the control group. Exposure to the injunctive norm increases the nutritional quality of the second food basket for parents by 1.3 points more in the treatment group compared to the control group. This effect is robust even when controlling for socio-demographic variables (columns 2 and 3). The effect of the *descriptive norm* becomes negative and statistically significant when we include control variables such as socio-demographic characteristics and food-related factors. This indicates that the impact of the *descriptive norm* on the nutritional quality of parents' baskets becomes more apparent when accounting for observable participant characteristics. Table B3 in the appendix shows the results with all control variables.

Table 5 shows the results of the difference-in-difference estimation of the FSA score of the child's baskets (mykid and otherkid). We find negative and significant effects of the *injunctive norm* on the nutritional quality of the child's baskets, suggesting that the *injunctive norm* significantly improves the nutritional quality of the child's baskets. Exposure to the injunctive norm leads to an improvement in the nutritional quality of the second food basket by 2.32 points when parents choose for their own child (column 1), compared to the control group. When making choices for another child, the effect is even stronger: the injunctive norm increases the nutritional quality of the second basket by 2.86 points (column 4) relative to the control group. We find a significant effect of the *descriptive norm* on the nutritional quality of children's baskets only in treatments where parents choose for another child. These effects remain significant when controlling for socio-demographic variables. Table B4 in the appendix shows the results with all control

variables.

We reject the second part of our hypothesis 3:

**Result 3b.** *Injunctive norm significantly improves the nutritional quality of parent's baskets.*

**Result 3c.** *Only the injunctive norm significantly improves the nutritional quality of all child's baskets. Descriptive norm significantly improves the nutritional quality of baskets for other children.*

To examine whether the effect of social norm treatments differs depending on whether the food basket is intended for the parent's own child or for another child, we estimated an interacted model including the interaction between the recipient of the food basket (own vs. other child) and the treatment condition (control, descriptive norm, injunctive norm). The results of this regression are presented in Table B5. We find no statistically significant differences in the nutritional quality of food baskets based on whether the parent was preparing the basket for their own child or for another child, across any of the treatment groups. In other words, exposure to descriptive or injunctive norms does not have a differential effect depending on the identity of the recipient. This finding aligns with our descriptive results shown in Figure 4, which also indicate that changes in nutritional quality between the two stages are similar regardless of whether the basket was made for one's own child or another child.

Table 4: Difference-in-difference on the FSA score of parents' baskets

| | FSA score of parent's baskets | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Stage 2 | -0.28 | -0.21 | -0.21 |
| | (0.14) | (0.14) | (0.15) |
| Descriptive | 0.00 | 0.72 | 0.78 |
| | (0.00) | (0.98) | (0.99) |
| Injunctive | 0.00 | 1.14* | 1.07* |
| | (0.00) | (0.58) | (0.62) |
| Stage 2 × Descriptive | -1.17 | -1.26** | -1.26** |
| | (0.50) | (0.54) | (0.54) |
| Stage 2 × Injunctive | -1.30*** | -1.33*** | -1.33*** |
| | (0.20) | (0.22) | (0.22) |
| Constant | 5.51*** | 17.95*** | 18.24*** |
| | (0.13) | (3.81) | (3.17) |
| N | 300 | 288 | 288 |
| Observations | 600 | 576 | 576 |
| Socio-demographic variables | No | Yes | Yes |
| Food-related variables | No | Yes | Yes |
| Free day | No | Yes | Yes |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1) shows the results of an OLS model with fixed effects and columns (2) and (3) the results with random effects.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Socio-demographic variables include gender, age, child age, number of children, Body Mass Index, and education level. Food-related variables include "Nutri-Score" reference, parent meeting PNNS' recommendations, food risk lover, and future food effects. We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height. See Table B3 in the appendix for the whole table.

Table 5: Difference-in-difference on the FSA score child's baskets.

| | FSA score of children's baskets | | | | | |
|---|---|---|---|---|---|---|
| | Mykid | Mykid | Mykid | Otherkid | Otherkid | Otherkid |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Stage 2 | -0.62 | -0.70** | -0.70** | 0.86 | 0.31 | 0.31 |
| | (0.32) | (0.34) | (0.34) | (0.59) | (0.44) | (0.44) |
| Descriptive | 0.00 | 1.41 | 1.48 | 0.00 | -0.47 | -1.05 |
| | (0.00) | (1.12) | (1.37) | (0.00) | (2.14) | (2.20) |
| Injunctive | 0.00 | 1.95 | 1.98 | 0.00 | -0.05 | -0.48 |
| | (0.00) | (1.37) | (1.42) | (0.00) | (0.47) | (0.47) |
| Stage 2 × Descriptive | 0.40 | 0.48 | 0.48 | -1.41* | -0.84** | -0.84** |
| | (0.87) | (0.91) | (0.91) | (0.46) | (0.38) | (0.39) |
| Stage 2 × Injunctive | -2.32* | -1.90*** | -1.90*** | -2.86** | -2.25*** | -2.25*** |
| | (0.74) | (0.56) | (0.56) | (0.64) | (0.51) | (0.51) |
| Constant | 7.16*** | 27.61*** | 29.94*** | 7.85*** | 15.17*** | 16.72*** |
| | (0.18) | (2.66) | (3.89) | (0.13) | (3.40) | (2.31) |
| N | 151 | 148 | 148 | 149 | 140 | 140 |
| Observations | 302 | 296 | 296 | 298 | 280 | 280 |
| Socio-demographic variables | No | Yes | Yes | No | Yes | Yes |
| Food-related variables | No | Yes | Yes | No | Yes | Yes |
| Free day | No | Yes | Yes | No | Yes | Yes |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1) and (4) show the results of an OLS model with fixed effects and columns (2), (3), (5) and (6) the results with random effects.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Socio-demographic variables include gender, age, child age, number of children, Body Mass Index, and education level. Food-related variables include "Nutri-Score" reference, child meeting PNNS' recommendations, food risk lover, and future food effects. We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height. See Table B4 in the appendix for the whole table.

# 6 Robustness test

## 6.1 Baskets' nutritional quality measure

As a robustness check, we construct an alternative indicator of nutritional quality to the aggregate nutritional quality of food baskets (FSA score), based on the composition of the food basket. Specifically, we calculate the ratio of healthy food items to the total number of items in each basket. We re-estimate our main specifications using this ratio as the dependent variable.

Table 6 reports the results from a difference-in-differences estimation examining how exposure to social norms affects the ratio of healthy items in parents' food baskets. The effect of the *descriptive norm* on the ratio of healthy food items is not statistically signif-

icant when estimating the model with fixed effects (Column 1). However, once control variables such as socio-demographic characteristics and food-related factors are introduced in Columns (2) and (3), the effect of the *descriptive norm* becomes positive and statistically significant. This indicates that the impact of the *descriptive norm* on healthier food choices becomes more apparent when accounting for observable participant characteristics. The effect of the *injunctive norm* is positive and statistically significant across all specifications. This suggests that exposure to the *injunctive norm* increases the share of healthy foods in the second basket compared to the control group by 0.8 points (column 1). The results obtained using the ratio of healthy food items in parents' food baskets are in line with those based on the aggregate nutritional quality (FSA score) of parents' food baskets. This consistency across both measures reinforces the robustness of our findings. In both cases, the *injunctive norm* has a positive and significant effect on the nutritional quality of parents' food choices, while the *descriptive norm* becomes significant only when controlling for socio-demographic and food-related characteristics. These results suggest that the impact of social norms on improving the healthiness of parents' food choices remains robust, regardless of the specific measure used to assess basket quality.

Table 7 reports the results from a difference-in-differences estimation examining how exposure of parents to social norms affects the ratio of healthy items in food baskets they make for children. The effect of the descriptive norm on the ratio of healthy items in a child's food baskets is positive and statistically significant in treatment where parents make food choices for another child (coefficients from 0.05 to 0.07). The effect of the injunctive norm on the ratio of healthy items in a child's food baskets is positive and significant in all specifications regardless of the child's identity (coefficients from 0.09 to 0.11 in own child's food basket and from 0.07 to 0.09 in another child's food basket ). The results from the difference-in-differences regression on the ratio of healthy food items in children's baskets confirm previous findings based on the aggregate nutritional quality score (FSA score). Overall, we observe that the injunctive norm consistently leads to a significant increase in the healthiness of a child's food baskets, regardless of

whether parents choose for their own child or for another child, while the descriptive norm improves the healthiness of a child's food baskets only when parents make food choices for another child . The similarity of results across two different measures of nutritional outcomes reinforces the conclusion that the effectiveness of social norms in shaping healthier parental food choices is robust to the way nutritional quality is assessed.

Table 6: Difference-in-difference on the ratio of healthy food items in parent's baskets.

| | Ratio of healthy food items | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Stage 2 | -0.00 | -0.01 | -0.01 |
| | (0.02) | (0.02) | (0.02) |
| Descriptive | 0.00 | 0.01 | 0.00 |
| | (0.00) | (0.05) | (0.06) |
| Injunctive | 0.00 | -0.05* | -0.04* |
| | (0.00) | (0.02) | (0.03) |
| Stage 2 × Descriptive | 0.05 | 0.06** | 0.06** |
| | (0.03) | (0.03) | (0.03) |
| Stage 2 × Injunctive | 0.08*** | 0.08*** | 0.08*** |
| | (0.01) | (0.01) | (0.01) |
| Constant | 0.58*** | -0.14 | -0.11 |
| | (0.01) | (0.18) | (0.17) |
| N | 300 | 288 | 288 |
| Observations | 600 | 576 | 576 |
| Socio-demographic variables | No | Yes | Yes |
| Food-related variables | No | Yes | Yes |
| Free day | No | Yes | Yes |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1) shows the results of an OLS model with fixed effects and columns (2) and (3) the results with random effects.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Socio-demographic variables include gender, age, child age, number of children, Body Mass Index, and education level. Food-related variables include "Nutri-Score" reference, parent meeting PNNS' recommendations, food risk lover, and future food effects. We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height. See Table B6 in the appendix for the whole table.

Table 7: Difference-in-difference on the ratio of healthy food items in child's baskets.

| | Ratio of healthy food items in child's baskets | | | | | |
|---|---|---|---|---|---|---|
| | Mykid | Mykid | Mykid | Otherkid | Otherkid | Otherkid |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Stage 2 | 0.03 | 0.03 | 0.03 | -0.02 | -0.01 | -0.01 |
| | (0.02) | (0.02) | (0.02) | (0.01) | (0.01) | (0.01) |
| Descriptive | 0.00 | -0.11 | -0.13 | 0.00 | 0.04 | 0.06 |
| | (0.00) | (0.09) | (0.10) | (0.00) | (0.08) | (0.08) |
| Injunctive | 0.00 | -0.09 | -0.09 | 0.00 | 0.01 | 0.02* |
| | (0.00) | (0.06) | (0.06) | (0.00) | (0.01) | (0.01) |
| Stage 2 × Descriptive | 0.00 | 0.00 | 0.00 | 0.07* | 0.05* | 0.05* |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| Stage 2 × Injunctive | 0.11* | 0.09*** | 0.09*** | 0.09** | 0.07*** | 0.07*** |
| | (0.03) | (0.03) | (0.04) | (0.02) | (0.03) | (0.03) |
| Constant | 0.47*** | -0.34 | -0.37 | 0.41*** | -0.01 | -0.06 |
| | (0.00) | (0.24) | (0.27) | (0.00) | (0.12) | (0.09) |
| N | 151 | 148 | 148 | 149 | 140 | 140 |
| Observations | 302 | 296 | 296 | 298 | 280 | 280 |
| Socio-demographic variables | No | Yes | Yes | No | Yes | Yes |
| Food-related variables | No | Yes | Yes | No | Yes | Yes |
| Free day | No | Yes | Yes | No | Yes | Yes |

Notes: Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1) and (4) show the results of an OLS model with fixed effects and columns (2), (3), (5) and (6) the results with random effects.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Socio-demographic variables include gender, age, child age, number of children, Body Mass Index, and education level. Food-related variables include "Nutri-Score" reference, child meeting PNNS' recommendations, food risk lover, and future food effects. We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height. See Table B7 in the appendix for the whole table.

# 7 Conclusion and discussion

This study has two objectives. First, we aim to identify the effects of social norms (a *descriptive norm* and an *injunctive norm*) on parents' beliefs about the nutritional quality of 15 food items. Second, we examine how these two types of information shape parents' food choices for themselves, their children, and an unknown child. We conduct a lab-in-the-field experiment at the museum "Cité des sciences et de l'industrie" in which we elicit parents' beliefs about the nutritional quality of the food items by asking them to assign a "NUTRI-SCORE" to each food item. Parents are also asked to select 4 items to make hypothetical food baskets for themselves and for their own child or an unknown child.

Our study reveals important insights into how information provision, specifically *descriptive norm* and *injunctive norm*, affects parents' beliefs and food choices. The findings suggest that *descriptive norm* significantly improves the accuracy of parents' beliefs about the nutritional quality of food items, while *injunctive norm* does not have the same effect. Furthermore, *injunctive norm* improves the nutritional quality of both the parent's and child's baskets. Interestingly, *descriptive norm* significantly enhances the nutritional quality of child's baskets only when parents are choosing for unknown child.

These findings hold several implications. First, they support existing literature that highlights the role of social norms in shaping dietary behaviors (Stok et al., 2014; Mollen et al., 2013). Our results suggest that informing parents about what other parents choose for their own consumption (descriptive norm) can lead to more accurate perceptions of food nutritional quality and healthier food choices. This confirms the idea that descriptive norms are more effective in influencing personal decisions compared to opinion-based information, as they provide concrete behavioral examples.

Second, the fact that parents consistently choose lower-quality food for their children compared to themselves, regardless of the child's identity (own child or unknown child), suggests that parental indulgence plays a key role in food decisions for children. Previous research (Marette et al., 2016) has shown that parents often indulge their children's preferences for less healthy foods, which may explain this pattern. However, the lack of

significant differences between choices for their own child versus an unknown child implies that this indulgence is not necessarily motivated by personal attachment or knowledge of the child's preferences, but perhaps by broader assumptions about children's food preferences.

From a policy perspective, these findings underscore the potential of social norm-based interventions to promote healthier eating behaviors, particularly among parents. Campaigns that highlight the healthy eating habits of other parents could be an effective strategy for improving the quality of family diets. In particular, descriptive norms could be leveraged in public health initiatives to correct misperceptions about food nutritional quality and encourage healthier food choices. Moreover, providing parents with information about what other parents believe to be appropriate for their children may help improve children's diets, especially in contexts where parents feel uncertain or uninformed about healthy choices. In addition, policymakers might adopt and tailor norm-based messages to support policies promoting front-of-pack labeling schemes like the "NUTRI-SCORE" that aim to promote healthier eating behaviors. For instance, descriptive norm messages such as "Most people choose snacks with "NUTRI-SCORE" A or B for themselves or their children" can be used in public spaces or retail settings to guide healthier choices. Similarly, injunctive norm messages like "Health experts recommend choosing foods with "NUTRI-SCORE" A or B can be implemented in public spaces or retail settings.

Finally, our results point to an ongoing challenge: parents' systematic underestimation of the nutritional quality of food items. This suggests that, beyond social norm interventions, educational programs aimed at improving parents' knowledge of nutrition are needed. Such programs could help bridge the gap between perceived and actual nutritional quality, ultimately leading to better food choices for both parents and children.

While our study provides valuable insights, it has some limitations. First, the experimental setting may not fully capture the complexity of real-world food choices, where factors like budget constraints, time pressures, and environmental cues play a significant role. Future research could explore the long-term effects of social norm interventions in

more naturalistic settings, such as grocery stores or schools.

Second, while our sample was diverse, it was drawn from a specific cultural context (Paris), and the findings may not generalize to other populations with different social norms and food practices. Indeed, our study takes place in a science museum, where visitors are likely to represent a sub-population with specific characteristics such as high socio-economics status, implying greater health consciousness, better nutrition knowledge, healthier eating habits, and greater openness to behavioral change (Wardle et al., 2000; Beydoun and Wang, 2008) compared to the general population. In fact, individuals with healthier eating habits may be less responsive to social norm cues when making food choices, as their baseline preferences already align with health-oriented behaviors. If we assume that visitors have better nutritional knowledge and healthier eating habits, then the observed effects of the social norm intervention in our study may actually underestimate its potential impact in more diverse or less health-aware populations. In other words, the selection bias, if present, would likely attenuate rather than inflate the intervention's effectiveness. To partially mitigate this issue, data collection also took place during free-entry days associated with the Science Festival, with the goal of attracting a broader and more heterogeneous audience. The descriptive statistics (Table 2) actually show a rather balanced distribution in terms of income and education. Nonetheless, we acknowledge that our findings should be interpreted with this limitation in mind, particularly when considering their generalizability to the wider population. Future studies could investigate the role of social norms in food choices across different cultural contexts.

Third, our study involves a hypothetical food choice task in which participants are asked to select food items, but their choice is not implemented (i.e., they do not receive or consume the chosen item as part of the study). The hypothetical feature of the task might raise questions regarding the validity of stated preferences in the absence of real consequences and could imply a hypothetical bias [22]. In the context of food choices, hypo-

[22]This bias refers to the tendency for individuals to report preferences or intentions that differ from what they would reveal in real choice situations involving actual costs or consequences (List and Gallet, 2001; Loomis, 2011) .

thetical bias could lead to overreporting of health-oriented behaviors, as participants may express intentions that are consistent with social desirability or personal aspirations rather than their true consumption preferences. Burchardi et al. (2005) find that consumers perceive fresh milk from local farmers as a trustful, high-quality product; however, they tend to report higher willingness to pay for such products in hypothetical settings compared to settings with real payoffs. This hypothetical bias may occur in our study. Without real incentives, participants may feel less constrained by trade-offs (e.g., taste vs. health, habit vs. norms), resulting in choices that are more reflective of perceived social expectations than true preferences. Despite these concerns, hypothetical food choice tasks can offer a practical solution, particularly in field settings where real-choice implementation may not be feasible due to logistical constraints. Furthermore, our design includes control groups, and the same hypothetical conditions apply uniformly across all experimental groups; any potential bias should be systematically similar across groups. This allows us to interpret observed differences in food choices as the effect of the treatments rather than as artifacts of the hypothetical nature of the task. In our study, while we did not provide real food items, we took several steps to enhance the credibility and salience of the task, including: (a) presenting realistic food choices that reflect actual market availability, (b) asking participants to make their choice of items as they would in a real-life food shopping situation., and (c) avoiding leading language or framing that could prime socially desirable responses.

Fourth, during the experiment, some parents completed the tasks while accompanied by their child, whereas others did not. This may introduce a potential source of heterogeneity in decision-making (Papoutsi et al., 2015). Unfortunately, we did not systematically collect data on whether the child was physically present next to the parent during the experiment tasks. As a result, we are unable to include this factor as a control variable in the analysis or provide treatment-specific frequencies. However, we did implement a procedure during data collection to help minimize potential interference: when children were present, they were offered a sheet of paper and crayons and invited to draw quietly

while their parent completed the experiment. This arrangement aimed to limit interaction and reduce the influence of the child on the parent's decision-making process during the task.

Fifth, the framing of the descriptive norm implies that the choices of the control groups reflect health-conscious behavior. However, control groups were simply asked to select four food items they would like to consume, without being explicitly instructed to base their choices on nutritional quality. We intentionally framed the descriptive norm as: "For a good nutritional quality diet, X% of parents chose this item" in order to align it conceptually with the injunctive norm, which explicitly promotes healthy food choices. Our aim was to present both norms as health-oriented behavioral cues, allowing for a more meaningful comparison between informational strategies that promote nutritional quality. We acknowledge that this framing may go beyond a purely observational description of others' behavior and could be interpreted by participants as an implicit recommendation, thereby combining normative influence with a health message. As such, it may confound the effect of social influence with a health cue. This wording could have amplified participants' responsiveness by simultaneously appealing to descriptive norms and health motivations. Future studies could instruct control groups to base their food choices on nutritional quality to avoid this limitation in the framing of the descriptive norm.

Finally, the phrasing of the messages of social norms may suggest a normative health recommendation, which could have led participants to interpret it as both social and nutritional guidance. The messages are based on actual behavioral data and aimed to reflect what others in a similar context had chosen or suggested. This framing potentially introduces a confound between social norms and nutritional priming. Then, the observed effects could partly reflect responses to perceived health cues in addition to social influence. While this limits the ability to isolate the effect of pure social norms, it does not invalidate the treatment. Furthermore, the way social norms were elicited involved presenting different statistics, which may prevent us from fully disentangling the effect of the social norm from the effect of the presented statistics. Future work could more cleanly

disentangle these channels.

In conclusion, our study highlights the importance of social norms in shaping parents' beliefs and choices about food. By understanding how these factors influence decision-making, public health interventions can be better designed to promote healthier eating habits within families, ultimately helping to address the growing problem of childhood obesity.

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## CRediT

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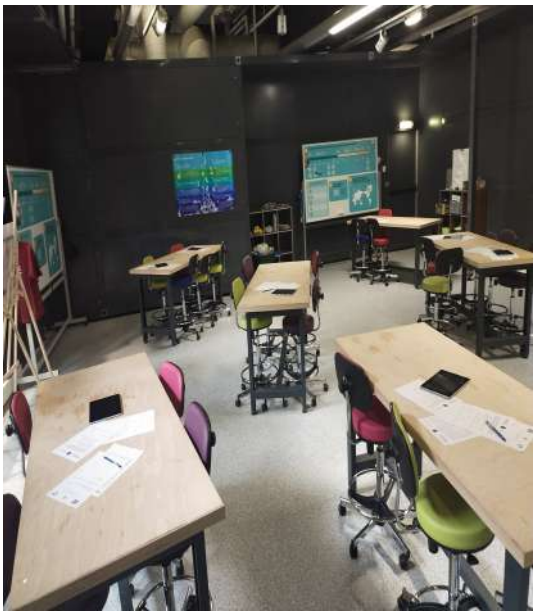
## Appendix A. Descriptive statistics and screenshots.

Figure A1: “NUTRI-SCORE” image.


Figure A2: List of 15 items used.

Figure A3: Experiment pictures.





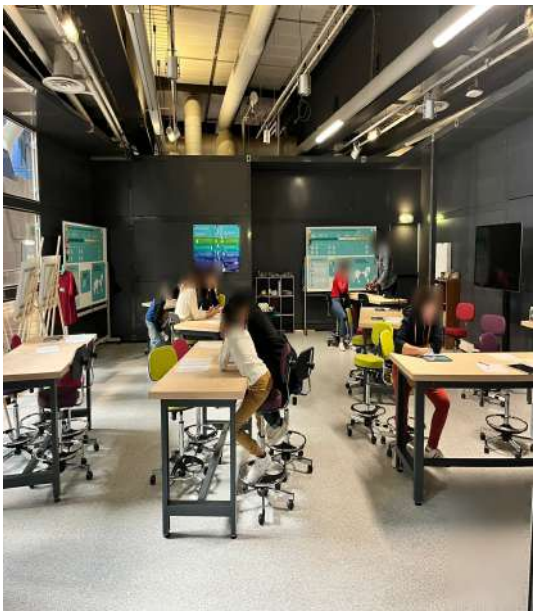


Table A1: descriptive statistics by free entry or not

| **Variables** | Free entry (1) | No free entry (2) | (1) vs. (2) |
|---|---|---|---|
| Age (mean) | 39.29 | 39.65 | 0.63 |
| Number of children (mean) | 1.61 | 1.54 | 0.43 |
| | | | |
| Education level | | | 0.77 |
| No diploma (%) | 1.73 | 2.36 | |
| Cap-bep (%) | 6.94 | 6.30 | |
| High school degree (%) | 17.92 | 11.02 | |
| Bachelor's degree (%) | 20.23 | 19.69 | |
| Master's degree (%) | 40.46 | 48.03 | |
| PhD (%) | 3.47 | 6.30 | |
| Others (%) | 9.25 | 6.30 | |
| | | | |
| Income | | | 0.05 |
| Less than 20000 (%) | 13.87 | 7.87 | |
| Between 20000 and 25000 (%) | 11.56 | 7.09 | |
| Between 25000 and 30000 (%) | 10.40 | 8.66 | |
| Between 30000 and 35000 (%) | 4.62 | 3.94 | |
| Between 35000 and 42000 (%) | 10.40 | 7.87 | |
| Between 42000 and 50000 (%) | 9.83 | 11.02 | |
| Between 50000 and 55000 (%) | 4.62 | 7.09 | |
| Between 55000 and 65000 (%) | 6.94 | 7.09 | |
| Between 65000 and 85000 (%) | 5.78 | 19.69 | |
| More than 85000 (%) | 9.83 | 12.60 | |
| No answer (%) | 12.14 | 7.09 | |
| | | | |
| Gender | | | 0.33 |
| Female (%) | 69.94 | 61.42 | |
| Male (%) | 27.75 | 38.58 | |
| No answer (%) | 2.31 | 0.00 | |
| | | | |
| N | 173 | 127 | |

*Notes*: The values reported in the last column for quantitative variables are the p-values obtained from a ttest. For education level, income and gender, the p-values of the Kolmogorov–Smirnov test are reported in the last column.

Table A2: descriptive statistics of parents' eating habits

| Variables | All | Control mykid | Control otherkid | Descriptive mykid | Descriptive otherkid | Injunctive mykid | Injunctive otherkid | Control mykid vs Descriptive mykid | Control mykid vs Injunctive mykid | Control otherkid vs Descriptive otherkid | Control otherkid vs Injunctive otherkid |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fruits and vegetables | | | | | | | | 0.75 | 1.00 | 0.90 | 0.95 |
| Never (%) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| Once a week or less (%) | 3.00 | 5.88 | 2.08 | 6.00 | 0.00 | 0.00 | 3.92 | | | | |
| Two to three times a week (%) | 12.67 | 7.84 | 18.75 | 14.00 | 10.00 | 10.00 | 15.69 | | | | |
| Four to six times a week (%) | 24.00 | 17.65 | 16.67 | 24.00 | 36.00 | 22.00 | 27.45 | | | | |
| Every day (%) | 60.33 | 68.63 | 62.50 | 56.00 | 54.00 | 68.00 | 52.94 | | | | |
| Dairy products | | | | | | | | 0.77 | 1.00 | 1.00 | 1.00 |
| Never (%) | 0.67 | 1.96 | 2.08 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| Once a week or less (%) | 6.33 | 7.84 | 6.25 | 6.00 | 8.00 | 6.00 | 3.92 | | | | |
| Two to three times a week (%) | 19.33 | 13.73 | 1.42 | 30.00 | 16.00 | 24.00 | 21.57 | | | | |
| Four to six times a week (%) | 19.33 | 19.61 | 29.17 | 8.00 | 24.00 | 20.00 | 17.65 | | | | |
| Every day (%) | 54 | 56.86 | 52.08 | 56.00 | 52.00 | 50.00 | 56.86 | | | | |
| Starchy food | | | | | | | | 0.73 | 1.00 | 0.35 | 1.00 |
| Never (%) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| Once a week or less (%) | 2.00 | 1.96 | 0.00 | 2.00 | 2.00 | 6.00 | 0.00 | | | | |
| Two to three times a week (%) | 13.33 | 11.76 | 4.17 | 20.00 | 20.00 | 12.00 | 11.76 | | | | |
| Four to six times a week (%) | 28.00 | 27.45 | 29.17 | 32.00 | 22.00 | 30.00 | 27.45 | | | | |
| Every day (%) | 56.00 | 58.82 | 66.67 | 46.00 | 56.00 | 52.00 | 60.78 | | | | |
| Fish and seafood | | | | | | | | 0.96 | 0.99 | 0.04 | 1.00 |
| Never (%) | 5.00 | 7.84 | 8.33 | 6.00 | 4.00 | 0.00 | 3.92 | | | | |
| Once a week or less (%) | 55.33 | 47.06 | 45.83 | 58.00 | 78.00 | 56.00 | 47.06 | | | | |
| Two to three times a week (%) | 33.33 | 41.18 | 33.33 | 32.00 | 12.00 | 42.00 | 39.22 | | | | |
| Four to six times a week (%) | 5.33 | 3.92 | 8.33 | 4.00 | 6.00 | 2.00 | 7.84 | | | | |
| Every day (%) | 1.00 | 0.00 | 4.17 | 0.00 | 0.00 | 0.00 | 1.96 | | | | |
| Unprocessed meat | | | | | | | | 1.00 | 1.00 | 1.00 | 1.00 |
| Never (%) | 2.33 | 1.96 | 4.17 | 4.00 | 0.00 | 4.00 | 0.00 | | | | |
| Once a week or less (%) | 13.67 | 13.73 | 14.58 | 18.00 | 14.00 | 10.00 | 11.76 | | | | |
| Two to three times a week (%) | 49.33 | 52.94 | 45.83 | 48.00 | 46.00 | 52.00 | 50.98 | | | | |
| Four to six times a week (%) | 28.00 | 25.49 | 29.17 | 28.00 | 30.00 | 28.00 | 27.45 | | | | |
| Every day (%) | 6.67 | 5.88 | 6.25 | 2.00 | 10.00 | 6.00 | 9.80 | | | | |
| Sweetened beverages | | | | | | | | 0.92 | 0.92 | 0.99 | 0.67 |
| Never (%) | 25.00 | 13.73 | 25.00 | 24.00 | 32.00 | 24.00 | 31.37 | | | | |
| Once a week or less (%) | 47.00 | 54.90 | 41.67 | 42.00 | 42.00 | 54.00 | 49.02 | | | | |
| Two to three times a week (%) | 18.00 | 19.61 | 20.83 | 24.00 | 22.00 | 12.00 | 11.76 | | | | |
| Four to six times a week (%) | 4.33 | 3.92 | 8.33 | 4.00 | 2.00 | 4.00 | 3.92 | | | | |
| Every day (%) | 5.00 | 7.84 | 4.17 | 6.00 | 2.00 | 6.00 | 3.92 | | | | |
| Processed food | | | | | | | | 1.00 | 0.84 | 0.89 | 0.96 |
| Never (%) | 13.33 | 15.69 | 12.50 | 14.00 | 16.00 | 10.00 | 11.76 | | | | |
| Once a week or less (%) | 64.00 | 54.90 | 62.50 | 52.00 | 70.00 | 72.00 | 72.55 | | | | |
| Two to three times a week (%) | 19.00 | 25.49 | 25.00 | 28.00 | 10.00 | 14.00 | 11.76 | | | | |
| Four to six times a week (%) | 3.00 | 1.96 | 0.00 | 4.00 | 4.00 | 4.00 | 3.92 | | | | |
| Every day (%) | 0.67 | 1.96 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | | | | |
| Snacking | | | | | | | | 1.00 | 1.00 | 1.00 | 0.43 |
| Never (%) | 16.67 | 15.69 | 14.58 | 16.00 | 18.00 | 22.00 | 13.73 | | | | |
| Very rarely (%) | 30.00 | 33.33 | 37.50 | 32.00 | 30.00 | 26.00 | 21.57 | | | | |
| Once or twice a week on average (%) | 29.67 | 29.41 | 27.08 | 36.00 | 32.00 | 26.00 | 27.45 | | | | |
| Once a day every day (%) | 17.67 | 15.69 | 16.67 | 12.00 | 12.00 | 22.00 | 27.45 | | | | |
| Several times a day every day (%) | 6.00 | 5.88 | 4.17 | 4.00 | 8.00 | 4.00 | 9.80 | | | | |
| N | 300 | 51.00 | 48.00 | 50.00 | 50.00 | 50.00 | 51.00 | - | - | - | - |

*Notes*: The p-values of the Kolmogorov–Smirnov test are reported in the last four columns. Questions were asked about parent's daily eating habits. For snacking, the question asked how often the parent snacked in the past month.

Table A3: descriptive statistics of children's eating habits

| **Variables** | All | Control mykid | Control otherkid | Descriptive mykid | Descriptive otherkid | Injunctive mykid | Injunctive otherkid | Control mykid vs Descriptive mykid | Control mykid vs Injunctive mykid | Control otherkid vs Descriptive otherkid | Control otherkid vs Injunctive otherkid |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fruits and vegetables | | | | | | | | 0.44 | 0.31 | 0.99 | 1.00 |
| Never (%) | 0.67 | 0.00 | 4.17 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| Once a week or less (%) | 2.67 | 1.96 | 2.08 | 4.00 | 2.00 | 2.00 | 3.92 | | | | |
| Two to three times a week (%) | 12.33 | 13.73 | 8.33 | 10.00 | 16.00 | 18.00 | 7.84 | | | | |
| Four to six times a week (%) | 25.67 | 11.76 | 25.00 | 30.00 | 30.00 | 26.00 | 31.37 | | | | |
| Every day (%) | 58.67 | 72.55 | 60.42 | 56.00 | 52.00 | 54.00 | 56.86 | | | | |
| Dairy products | | | | | | | | 1.00 | 0.99 | 1.00 | 1.00 |
| Never (%) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| Once a week or less (%) | 1.67 | 3.92 | 0.00 | 0.00 | 2.00 | 0.00 | 3.92 | | | | |
| Two to three times a week (%) | 8.33 | 7.84 | 4.17 | 6.00 | 4.00 | 20.00 | 7.84 | | | | |
| Four to six times a week (%) | 17.67 | 13.73 | 22.92 | 20.00 | 22.00 | 10.00 | 17.65 | | | | |
| Every day (%) | 72.33 | 74.51 | 72.92 | 74.00 | 72.00 | 70.00 | 70.59 | | | | |
| Starchy food | | | | | | | | 0.42 | 1.00 | 0.76 | 0.93 |
| Never (%) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| Once a week or less (%) | 1.00 | 1.96 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | | | | |
| Two to three times a week (%) | 9.00 | 5.88 | 4.17 | 14.00 | 12.00 | 8.00 | 9.80 | | | | |
| Four to six times a week (%) | 29.00 | 27.45 | 25.00 | 36.00 | 30.00 | 26.00 | 29.41 | | | | |
| Every day (%) | 61.00 | 64.71 | 70.83 | 48.00 | 58.00 | 64.00 | 60.78 | | | | |
| Fish and seafood | | | | | | | | 0.87 | 0.72 | 0.65 | 0.92 |
| Never (%) | 4.00 | 3.92 | 10.42 | 4.00 | 4.00 | 2.00 | 0.00 | | | | |
| Once a week or less (%) | 54.000 | 45.10 | 41.67 | 56.00 | 62.00 | 60.00 | 58.82 | | | | |
| Two to three times a week (%) | 34.67 | 45.10 | 37.50 | 36.00 | 28.00 | 31.00 | 21.45 | | | | |
| Four to six times a week (%) | 6.33 | 5.88 | 6.25 | 4.00 | 6.00 | 4.00 | 11.76 | | | | |
| Every day (%) | 1.00 | 0.00 | 4.17 | 0.00 | 0.00 | 0.00 | 1.96 | | | | |
| Unprocessed meat | | | | | | | | 1.00 | 1.00 | 0.95 | 0.98 |
| Never (%) | 0.67 | 1.96 | 2.08 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| Once a week or less (%) | 9.00 | 5.88 | 12.50 | 10.00 | 12.00 | 8.00 | 5.88 | | | | |
| Two to three times a week (%) | 50.00 | 56.86 | 43.75 | 52.00 | 46.00 | 50.00 | 50.98 | | | | |
| Four to six times a week (%) | 32.33 | 31.37 | 35.42 | 34.00 | 26.00 | 36.00 | 31.37 | | | | |
| Every day (%) | 8.00 | 3.92 | 6.25 | 4.00 | 16.00 | 6.00 | 11.76 | | | | |
| Sweetened beverages | | | | | | | | 0.78 | 1.00 | 0.58 | 1.00 |
| Never (%) | 20.00 | 15.69 | 20.00 | 28.00 | 22.00 | 20.00 | 13.73 | | | | |
| Once a week or less (%) | 51.00 | 56.86 | 54.17 | 46.00 | 38.00 | 50.00 | 60.78 | | | | |
| Two to three times a week (%) | 19.33 | 17.65 | 10.42 | 18.00 | 34.00 | 18.00 | 17.65 | | | | |
| Four to six times a week (%) | 7.00 | 5.88 | 8.33 | 8.00 | 6.00 | 8.00 | 5.88 | | | | |
| Every day (%) | 2.67 | 3.92 | 6.25 | 0.00 | 0.00 | 4.00 | 1.96 | | | | |
| Processed food | | | | | | | | 0.82 | 0.82 | 0.40 | 0.52 |
| Never (%) | 14.33 | 21.57 | 14.58 | 10.00 | 18.00 | 10.00 | 11.76 | | | | |
| Once a week or less (%) | 65.33 | 54.90 | 54.17 | 70.00 | 68.00 | 72.00 | 72.55 | | | | |
| Two to three times a week (%) | 17.00 | 19.61 | 29.17 | 14.00 | 10.00 | 16.00 | 13.73 | | | | |
| Four to six times a week (%) | 2.67 | 1.96 | 2.08 | 4.00 | 4.00 | 2.00 | 1.96 | | | | |
| Every day (%) | 0.67 | 1.96 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | | | | |
| Snacking | | | | | | | | 0.55 | 1.00 | 1.00 | 1.00 |
| Never (%) | 20.00 | 21.57 | 20.83 | 30.00 | 18.00 | 16.00 | 13.73 | | | | |
| Very rarely (%) | 35.33 | 27.45 | 31.25 | 34.00 | 38.00 | 40.00 | 41.18 | | | | |
| Once or twice a week on average (%) | 23.00 | 25.49 | 27.08 | 20.00 | 18.00 | 24.00 | 23.53 | | | | |
| Once a day every day (%) | 18.33 | 23.53 | 18.75 | 12.00 | 20.00 | 18.00 | 17.65 | | | | |
| Several times a day every day (%) | 3.33 | 1.96 | 2.08 | 4.00 | 6.00 | 2.00 | 3.92 | | | | |
| N | 300 | 51.00 | 48.00 | 50.00 | 50.00 | 50.00 | 51.00 | - | - | - | - |

*Notes*: The p-values of the Kolmogorov–Smirnov test are reported in the last four columns. Questions were asked about child's daily eating habits. For snacking, the question asked how often the child snacked in the past month.

Table A4: Treatment schedule.

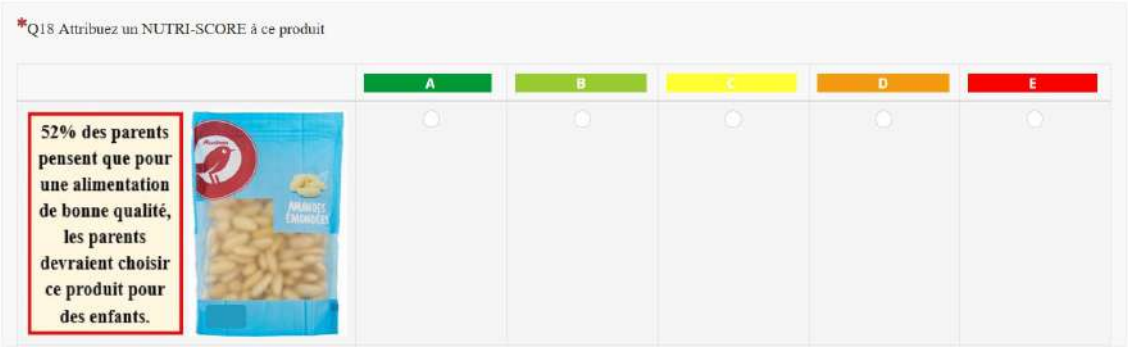
| Slots | Day 1 (free entry) | Day 2 (free entry) | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| 10:30 am- 12:00 pm | Control_mykid | Control_otherkid | - | - | - |
| 11:00 am - 12pm | - | - | Injuctive_otherkid | Descriptive_otherkid | Injuctive_mykid |
| 12:00 - 14:00 pm | Control_otherkid | Control_mykid | Injuctive_otherkid | Descriptive_mykid | Descriptive_mykid |
| 14:00 - 15:30 pm | Injuctive_mykid | Injuctive_mykid | Descriptive_mykid | Injuctive_mykid | Descriptive_otherkid |
| 15:30 - 17:00 pm | - | - | Descriptive_otherkid | Descriptive_mykid | Injuctive_otehrkid and Descriptive_mykid |
| 15:30 - 17:40 pm | Injuctive_otherkid | Injuctive_otherkid and Control_mykid | - | - | - |

Figure A4: “NUTRI-SCORE” assignment.

Without social norms


With *descriptive norm*


With *injunctive norm*

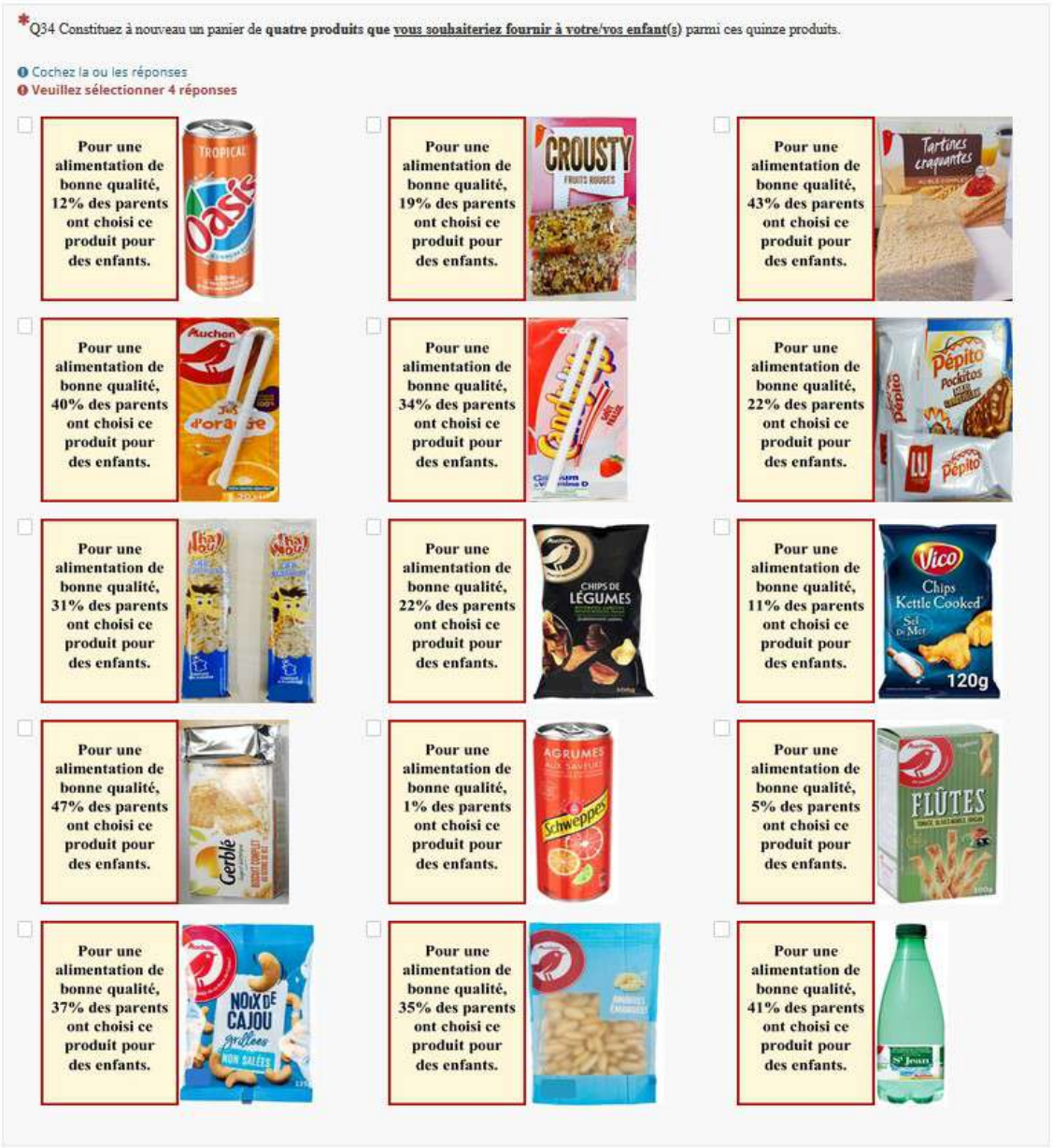



*Notes*: The instruction was: assign a “NUTRI-SCORE” to this product.

Figure A5: Second basket for parent in *descriptive norm* treatments.


*Notes*: The instruction was: once again, put together a basket of four of the fifteen products you would like to consume. For the first basket, the instruction was: put together a basket of four of the fifteen products you would like to consume. The image was the same as in the first basket and in control groups, except that the descriptive norm was not displayed.
The information provided in the boxes was: *for a good nutritional quality diet, X% of adults have chosen this item for their own consumption*.

Figure A6: Second basket for child in *descriptive norm* treatments.




*Notes*: The instruction in "*mykid*" treatments was: Once again, put together a basket of four products that you would like to provide to your child(ren) from these fifteen products. In "*otherkid*" treatments was: once again, put together a basket of four of the fifteen products you would like to provide to another participant's child. The image was the same as in the first basket and in control groups, except that the descriptive norm was not displayed.
The information provided in the boxes was: *for good nutritional quality diet, X% of parents have chosen this item for children*.

Figure A7: Second basket for parent in *injunctive norm* treatments.


*Notes*: The instruction was: once again, put together a basket of four of the fifteen products you would like to consume. For the first basket, the instruction was: put together a basket of four of the fifteen products you would like to consume. The image was the same as in the first basket and in control groups, except that the injunctive norm was not displayed.
The information provided in the boxes was: *X% of adults think that for a good nutritional quality diet, adults should choose this item for their own consumption*.

Figure A8: Second basket for child in *injunctive norm* treatments.


*Notes*: The instruction in "*mykid*" treatments was: Once again, put together a basket of four products that you would like to provide to your child(ren) from these fifteen products. In "*otherkid*" treatments was: once again, put together a basket of four of the fifteen products you would like to provide to another participant's child. The image was the same as in the first basket and in control groups, except that the injunctive norm was not displayed.
The information provided in the boxes was: *X% of parents think that for a good nutritional quality diet, parents should choose this item for children*.

## Appendix B. Difference-in-difference estimations showing all control variables.

Table B1 provides the results of the difference-in-difference estimation of the belief elicitation with all participants and all control variables. The coefficient for *Female* is negative and significant for the overestimation rate which suggests that women (compared to men) underestimate rather than overestimate the nutritional quality of food items. Parents with healthy eating habits are more likely to underestimate the nutritional quality of food items (*Fourth quartile*). The coefficient for *Number of children* is negative and significant for the overestimation rate which suggests that the higher the number of children, the lower the parents' overestimation of the nutritional quality of food.

Table B2 presents the results of the multiple hypothesis testing, where p-values are adjusted using the Holm-Bonferroni correction method to account for the risk of false positives due to multiple comparisons. This adjustment ensures a more robust interpretation of the statistical significance of treatment effects across the different belief measures. The results of this correction provide a conservative test of our findings. Notably, the key treatment effect of the descriptive norm on the overestimation rate remains statistically significant after Holm-Bonferroni correction. These findings give us more confidence in the robustness of our main conclusions regarding the descriptive norm treatment.

Table B3 shows the results of the difference-in-difference estimation of of the FSA score of the parents' baskets with all control variables. Parents who declare referring to the "NUTRI-SCORE" when shopping select food baskets with significantly better nutritional quality (*"Nutri-Score" reference*). Women make food baskets with significantly better nutritional quality for themselves than men. Parents with healthy eating habits select food baskets with better nutritional quality for themselves (*Third quartile* and *Fourth quartile* in column 2). We find a positive and significant effect for the variable *Food risk lover*. This means that parents who are more willing to take risks when it comes to food risks make baskets with lower nutritional quality. We also find a negative and significant coefficient for the variable *Future food effects*. This suggests that parents who consider the potential future health effects of their food choices make baskets with better nutritional quality.

Table B4 provides the results of the difference-in-difference estimation of the FSA score of the child's baskets with all control variables. Parents who refer to the "NUTRI-SCORE" select food baskets with significantly better nutritional quality only when they make the choice for their own child (column 2). The effect becomes insignificant in column (3). Women select food baskets for their own child with significantly better nutritional quality than men. Parents who have children with healthy eating habits select food baskets with the better nutritional quality only when they make the choice for an unknown random child (otherkid). We find a significant and negative for *Future food effects* in columns 3 and 6. This suggests that parents who consider the potential future health effects of their food choices make baskets with better nutritional quality for children.

Table B1: Difference-in-difference on belief accuracy with all participants showing all control variables.

| | Absolute belief gap | Absolute belief gap | Overestimation rate | Overestimation rate | Underestimation rate | Underestimation rate | Accuracy rate | Accuracy rate |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Stage 2 | -0.31 | -0.35** | 2.15*** | 2.20*** | -3.16** | -3.22*** | 1.01 | 1.03 |
| | (0.20) | (0.16) | (0.36) | (0.33) | (0.92) | (0.92) | (1.10) | (1.21) |
| Descriptive | 0.00 | 0.49 | 0.00 | 2.54 | 0.00 | -2.46 | 0.00 | -0.07 |
| | (0.00) | (0.37) | (0.00) | (2.67) | (0.00) | (1.77) | (0.00) | (1.97) |
| Injunctive | 0.00 | -0.24 | 0.00 | -0.25 | 0.00 | -1.08 | 0.00 | 1.34* |
| | (0.00) | (0.43) | (0.00) | (0.42) | (0.00) | (1.21) | (0.00) | (0.81) |
| Stage 2 × Descriptive | -0.05 | -0.02 | -2.29** | -2.27*** | 0.90 | 0.93 | 1.39 | 1.33 |
| | (0.16) | (0.18) | (0.52) | (0.57) | (0.90) | (0.97) | (1.23) | (1.18) |
| Stage 2 × Injunctive | 0.25 | 0.26* | -0.97 | -0.77 | 1.71 | 1.66 | -0.75 | -0.89 |
| | (0.13) | (0.13) | (0.59) | (0.64) | (2.21) | (2.21) | (2.40) | (2.69) |
| Free day | | 0.30 | | 0.58 | | -1.63 | | 1.04 |
| | | (0.48) | | (2.13) | | (3.30) | | (1.72) |
| Nutri-Score reference | | -0.36 | | -1.50* | | 2.54** | | -1.04** |
| | | (0.34) | | (0.86) | | (1.27) | | (0.44) |
| Female | | 0.18 | | -4.77** | | 4.10*** | | 0.67 |
| | | (0.16) | | (2.05) | | (0.83) | | (1.60) |
| Participant's age | | 0.02 | | 0.09 | | -0.02 | | -0.08 |
| | | (0.03) | | (0.18) | | (0.07) | | (0.12) |
| Child age | | -0.02 | | 0.27 | | -0.33 | | 0.07 |
| | | (0.09) | | (0.66) | | (0.38) | | (0.31) |
| Number of child | | 0.26** | | -3.00*** | | 3.27* | | -0.27 |
| | | (0.11) | | (0.84) | | (1.81) | | (1.22) |
| Body Mass Index | | | | | | | | |
| Normal weight | | Ref | | Ref | | Ref | | Ref |
| Underweight | | 0.99 | | 6.42 | | -2.62 | | -3.80 |
| | | (1.70) | | (4.35) | | (4.19) | | (2.96) |
| Overweight | | -0.56* | | -3.34*** | | 1.82 | | 1.52 |
| | | (0.30) | | (1.24) | | (1.91) | | (1.71) |
| Education level | | | | | | | | |
| No diploma | | Ref | | Ref | | Ref | | Ref |
| Cap-bep | | 0.07 | | 0.90 | | 2.06 | | -2.96 |
| | | (1.12) | | (7.39) | | (3.73) | | (4.13) |
| High school degree | | -1.30 | | -3.00 | | 5.13 | | -2.13 |
| | | (1.81) | | (7.65) | | (4.19) | | (4.35) |
| Bachelor's degree | | -1.98 | | -5.01 | | 5.65* | | -0.64 |
| | | (1.45) | | (6.53) | | (3.14) | | (3.75) |
| Master's degree | | -2.05 | | -5.83 | | 5.58** | | 0.25 |
| | | (1.47) | | (5.99) | | (2.22) | | (4.22) |
| PhD | | -1.42 | | -11.00* | | 10.88** | | 0.11 |
| | | (1.07) | | (6.00) | | (5.32) | | (2.15) |
| Others | | -0.50 | | -4.78 | | 7.50 | | -2.72 |
| | | (1.69) | | (8.58) | | (4.94) | | (3.87) |
| Parent meeting PNNS' recommendations | | | | | | | | |
| First quartile | | Ref | | Ref | | Ref | | Ref |
| Second quartile | | -0.64* | | -1.41 | | -0.19 | | 1.60 |
| | | (0.34) | | (1.64) | | (1.31) | | (1.64) |
| Third quartile | | 0.30*** | | 1.66 | | 0.65 | | -2.31** |
| | | (0.11) | | (1.43) | | (1.25) | | (1.07) |
| Fourth quartile | | 0.22 | | -4.88** | | 6.43 | | -1.56 |
| | | (0.37) | | (1.97) | | (4.03) | | (2.48) |
| Food risk lover | | -0.04 | | -0.37*** | | 0.52** | | -0.15 |
| | | (0.10) | | (0.07) | | (0.22) | | (0.21) |
| Future food effects | | -0.21 | | -0.56** | | -0.18 | | 0.74* |
| | | (0.14) | | (0.27) | | (0.45) | | (0.43) |
| Constant | 14.50*** | 16.97*** | 26.89*** | 41.51*** | 40.40*** | 27.79*** | 32.71*** | 30.70*** |
| | (0.08) | (0.50) | (0.08) | (8.92) | (0.30) | (4.37) | (0.29) | (4.94) |
| N | 300 | 288 | 300 | 288 | 300 | 288 | 300 | 288 |
| Observations | 600 | 576 | 600 | 576 | 600 | 576 | 600 | 576 |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1), (3), (5) and (7) show the results of an OLS model with fixed effects an
(8) the results with random effects.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

We lose 10 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 6 who did not give either their weight or t
not give his gender nor his weight and height.

Table B2: P-values and Holm-Bonferroni Adjusted Q-values by Treatment

| Outcome | Treatment | P-value | Q-value (Holm-Bonferroni) |
|---|---|---|---|
| Overestimation rate | Descriptive | 0.022 | 0.088 |
| | Injunctive | 0.203 | 0.609 |
| Accuracy rate | Descriptive | 0.340 | 0.780 |
| | Injunctive | 0.776 | 0.776 |
| Underestimation rate | Descriptive | 0.390 | 0.780 |
| | Injunctive | 0.495 | 0.776 |
| Absolute belief gap | Descriptive | 0.792 | 0.792 |
| | Injunctive | 0.141 | 0.564 |

Table B3: Difference-in-difference on the FSA score of parent's baskets showing all control variables.

| | FSA score of parent's baskets | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Stage 2 | -0.28 | -0.21 | -0.21 |
| | (0.14) | (0.14) | (0.15) |
| Descriptive | 0.00 | 0.72 | 0.78 |
| | (0.00) | (0.98) | (0.99) |
| Injunctive | 0.00 | 1.14* | 1.07* |
| | (0.00) | (0.58) | (0.62) |
| Stage 2 × Descriptive | -1.17 | -1.26** | -1.26** |
| | (0.50) | (0.54) | (0.54) |
| Stage 2 × Injunctive | -1.30*** | -1.33*** | -1.33*** |
| | (0.20) | (0.22) | (0.22) |
| Free day | | 0.17 | 0.29 |
| | | (0.46) | (0.53) |
| Nutri-Score reference | | -1.19 | -1.16* |
| | | (0.86) | (0.70) |
| Female | | -2.44*** | -2.27*** |
| | | (0.17) | (0.21) |
| Participant's age | | -0.09*** | -0.08*** |
| | | (0.02) | (0.02) |
| Child age | | -0.16 | -0.15 |
| | | (0.11) | (0.13) |
| Number of child | | -0.49 | -0.42 |
| | | (0.56) | (0.42) |
| Body Mass Index | | | |
| Normal weight | | Ref | Ref |
| Underweight | | -0.67 | -0.59 |
| | | (2.42) | (2.10) |
| Overweight | | -0.08 | -0.32 |
| | | (0.57) | (0.49) |
| Education level | | | |
| No diploma | | Ref | Ref |
| Cap-bep | | -3.61 | -3.45 |
| | | (2.83) | (2.49) |
| High school degree | | -3.59 | -3.63 |
| | | (2.46) | (2.27) |
| Bachelor's degree | | -5.07* | -4.32* |
| | | (2.68) | (2.36) |
| Master's degree | | -3.65 | -2.99 |
| | | (2.37) | (2.09) |
| PhD | | -4.89 | -4.43* |
| | | (3.07) | (2.61) |
| Others | | -3.74 | -3.29 |
| | | (2.70) | (2.63) |
| Parent meeting PNNS' recommendations | | | |
| First quartile | | Ref | Ref |
| Second quartile | | -1.04 | -0.67 |
| | | (0.87) | (0.94) |
| Third quartile | | -1.59*** | -1.19*** |
| | | (0.35) | (0.42) |
| Fourth quartile | | -1.99*** | -1.34*** |
| | | (0.54) | (0.46) |
| Food risk lover | | | 0.22*** |
| | | | (0.07) |
| Future food effects | | | -0.36*** |
| | | | (0.11) |
| Constant | 5.51*** | 17.95*** | 18.24*** |
| | (0.13) | (3.81) | (3.17) |
| N | 300 | 288 | 288 |
| Observations | 600 | 576 | 576 |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1) shows the results of an OLS model with fixed effects and columns (2) and (3) the results with random effects.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height.

Table B4: Difference-in-difference on the FSA score child's baskets showing all control variables.

| | FSA score of children's baskets | | | | | |
|---|---|---|---|---|---|---|
| | Mykid | Mykid | Mykid | Otherkid | Otherkid | Otherkid |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Stage 2 | -0.62 | -0.70** | -0.70** | 0.86 | 0.31 | 0.31 |
| | (0.32) | (0.34) | (0.34) | (0.59) | (0.44) | (0.44) |
| Descriptive | 0.00 | 1.41 | 1.48 | 0.00 | -0.47 | -1.05 |
| | (0.00) | (1.12) | (1.37) | (0.00) | (2.14) | (2.20) |
| Injunctive | 0.00 | 1.95 | 1.98 | 0.00 | -0.05 | -0.48 |
| | (0.00) | (1.37) | (1.42) | (0.00) | (0.47) | (0.47) |
| Stage 2 × Descriptive | 0.40 | 0.48 | 0.48 | -1.41* | -0.84** | -0.84** |
| | (0.87) | (0.91) | (0.91) | (0.46) | (0.38) | (0.39) |
| Stage 2 × Injunctive | -2.32* | -1.90*** | -1.90*** | -2.86** | -2.25*** | -2.25*** |
| | (0.74) | (0.56) | (0.56) | (0.64) | (0.51) | (0.51) |
| Free day | | 1.34 | 1.69 | | -0.71 | -1.37 |
| | | (1.41) | (1.80) | | (1.35) | (1.34) |
| Nutri-Score reference | | -1.73** | -1.12 | | -0.81 | -1.17*** |
| | | (0.76) | (0.96) | | (0.66) | (0.38) |
| Female | | -2.82** | -2.19*** | | -1.10 | -0.91 |
| | | (1.17) | (0.68) | | (1.57) | (1.33) |
| Participant's age | | -0.26** | -0.23* | | -0.10** | -0.10 |
| | | (0.12) | (0.14) | | (0.04) | (0.06) |
| Child age | | 0.18 | 0.24 | | 0.43*** | 0.43*** |
| | | (0.20) | (0.19) | | (0.09) | (0.09) |
| Number of child | | -1.76*** | -1.63*** | | -1.47*** | -0.95 |
| | | (0.27) | (0.26) | | (0.53) | (0.97) |
| Body Mass Index | | | | | | |
| Normal weight | | Ref | Ref | | Ref | Ref |
| Underweight | | 0.18 | 0.40 | | 0.00 | 0.00 |
| | | (0.92) | (0.49) | | (.) | (.) |
| Overweight | | 0.46 | 0.07 | | 0.77 | 0.56 |
| | | (1.65) | (1.99) | | (0.75) | (0.83) |
| Education level | | | | | | |
| No diploma | | Ref | Ref | | Ref | Ref |
| Cap-bep | | -10.07*** | -8.18*** | | 1.23 | 1.31 |
| | | (0.50) | (1.19) | | (2.06) | (0.98) |
| High school degree | | -6.17** | -5.98** | | -0.19 | -0.19 |
| | | (2.68) | (2.85) | | (2.90) | (1.89) |
| Bachelor's degree | | -8.61*** | -7.43*** | | -0.02 | 1.62 |
| | | (2.53) | (2.59) | | (3.88) | (4.33) |
| Master's degree | | -7.68*** | -6.61*** | | 0.76 | 2.65 |
| | | (1.88) | (2.01) | | (3.25) | (3.00) |
| PhD | | -5.30*** | -4.75*** | | -0.98 | 2.02 |
| | | (1.58) | (1.14) | | (3.73) | (3.14) |
| Others | | -2.42 | -1.64 | | -0.07 | 0.88 |
| | | (1.93) | (1.76) | | (3.71) | (2.38) |
| Child meeting PNNS' recommendations | | | | | | |
| First quartile | | Ref | Ref | | Ref | Ref |
| Second quartile | | -1.52 | -1.40 | | -3.42** | -2.51 |
| | | (1.50) | (1.41) | | (1.64) | (2.08) |
| Third quartile | | -0.61 | -0.24 | | -4.49* | -3.62* |
| | | (1.89) | (1.46) | | (2.34) | (2.11) |
| Fourth quartile | | -1.20 | -0.80 | | -4.99*** | -4.79** |
| | | (1.34) | (1.20) | | (1.90) | (1.89) |
| Food risk lover | | | -0.09 | | | 0.50 |
| | | | (0.21) | | | (0.40) |
| Future food effects | | | -0.80** | | | -0.66 |
| | | | (0.32) | | | (0.45) |
| Constant | 7.16*** | 27.61*** | 29.94*** | 7.85*** | 15.17*** | 16.72*** |
| | (0.18) | (2.66) | (3.89) | (0.13) | (3.40) | (2.31) |
| N | 151 | 148 | 148 | 149 | 140 | 140 |
| Observations | 302 | 296 | 296 | 298 | 280 | 280 |

Notes: Robust standard errors clustered at the time slot level in parentheses.Columns (1) and (4) show the results of an OLS model with fixed effects and columns (2), (3), (5) and (6) the results with random effects.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height.

Table B5: Effect of treatments on nutritional quality of child's food baskets by recipient identity (Own vs. Other Child).

| | FSA score of children's baskets | |
|---|---|---|
| | (1) | (2) |
| Mykid | -1.56 | -1.75 |
| | (2.14) | (1.67) |
| Descriptive | -0.04 | 0.29 |
| | (1.47) | (2.07) |
| Injunctive | -0.55 | -0.32 |
| | (0.80) | (1.37) |
| Mykid × Descriptive | 1.16 | 0.80 |
| | (1.71) | (1.41) |
| Mykid × Injunctive | 0.46 | 0.64 |
| | (2.51) | (2.34) |
| Free day | | 0.47 |
| | | (1.84) |
| Nutri-Score reference | | -0.99*** |
| | | (0.33) |
| Female | | -2.07*** |
| | | (0.34) |
| Participant's age | | -0.17** |
| | | (0.08) |
| Child age | | 0.13 |
| | | (0.14) |
| Number of child | | -1.35*** |
| | | (0.24) |
| Body Mass Index | | |
| Normal weight | | Ref |
| Underweight | | 1.33 |
| | | (0.99) |
| Overweight | | 0.58 |
| | | (0.37) |
| Education level | | |
| No diploma | | Ref |
| Cap-bep | | -3.26 |
| | | (2.04) |
| High school degree | | -2.39 |
| | | (2.82) |
| Bachelor's degree | | -3.79 |
| | | (2.89) |
| Master's degree | | -2.84 |
| | | (2.54) |
| PhD | | -2.46 |
| | | (3.05) |
| Others | | -0.61 |
| | | (2.99) |
| Parent meeting PNNS' recommendations | | |
| First quartile | | Ref |
| Second quartile | | -2.37 |
| | | (1.65) |
| Third quartile | | -2.82 |
| | | (2.17) |
| Fourth quartile | | -2.85** |
| | | (1.42) |
| Constant | 7.76*** | 21.84*** |
| | (0.46) | (2.58) |
| Observations | 600 | 576 |

Notes: Robust standard errors clustered at the time slot level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height.

Table B6: Difference-in-difference on the ratio of healthy food items of parent's baskets showing all control variables.

| | Ratio of healthy food items | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Stage 2 | -0.00 | -0.01 | -0.01 |
| | (0.02) | (0.02) | (0.02) |
| Descriptive | 0.00 | 0.01 | 0.00 |
| | (0.00) | (0.05) | (0.06) |
| Injunctive | 0.00 | -0.05* | -0.04* |
| | (0.00) | (0.02) | (0.03) |
| Stage 2 × Descriptive | 0.05 | 0.06** | 0.06** |
| | (0.03) | (0.03) | (0.03) |
| Stage 2 × Injunctive | 0.08*** | 0.08*** | 0.08*** |
| | (0.01) | (0.01) | (0.01) |
| Free day | | 0.04 | 0.04 |
| | | (0.05) | (0.05) |
| Nutri-Score reference | | 0.09*** | 0.09*** |
| | | (0.02) | (0.01) |
| Female | | 0.10*** | 0.10*** |
| | | (0.01) | (0.01) |
| Participant's age | | 0.00** | 0.00* |
| | | (0.00) | (0.00) |
| Child age | | 0.00 | 0.00 |
| | | (0.01) | (0.01) |
| Number of child | | 0.03 | 0.03 |
| | | (0.03) | (0.02) |
| Body Mass Index | | | |
| Normal weight | | Ref | Ref |
| Underweight | | 0.09 | 0.09 |
| | | (0.11) | (0.10) |
| Overweight | | 0.01 | 0.03 |
| | | (0.03) | (0.03) |
| Education level | | | |
| No diploma | | Ref | Ref |
| Cap-bep | | 0.21** | 0.22** |
| | | (0.11) | (0.09) |
| High school degree | | 0.24* | 0.25** |
| | | (0.13) | (0.12) |
| Bachelor's degree | | 0.30** | 0.28** |
| | | (0.14) | (0.11) |
| Master's degree | | 0.24* | 0.23** |
| | | (0.13) | (0.10) |
| PhD | | 0.31** | 0.30** |
| | | (0.16) | (0.14) |
| Others | | 0.18 | 0.17 |
| | | (0.16) | (0.15) |
| Parent meeting PNNS' recommendations | | | |
| First quartile | | Ref | Ref |
| Second quartile | | 0.06** | 0.05* |
| | | (0.03) | (0.03) |
| Third quartile | | 0.09*** | 0.08*** |
| | | (0.01) | (0.02) |
| Fourth quartile | | 0.13*** | 0.11*** |
| | | (0.02) | (0.03) |
| Food risk lover | | | -0.02*** |
| | | | (0.00) |
| Future food effects | | | 0.01 |
| | | | (0.01) |
| Constant | 0.58*** | -0.14 | -0.11 |
| | (0.01) | (0.18) | (0.17) |
| N | 300 | 288 | 288 |
| Observations | 600 | 576 | 576 |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1) shows the results of an OLS model with fixed effects and columns (2) and (3) the results with random effects.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height.

Table B7: Difference-in-difference on the ratio of healthy food items of child's baskets showing all control variables.

| | Ratio of healthy food items in child's baskets | | | | | |
|---|---|---|---|---|---|---|
| | Mykid | Mykid | Mykid | Otherkid | Otherkid | Otherkid |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Stage 2 | 0.03 | 0.03 | 0.03 | -0.02 | -0.01 | -0.01 |
| | (0.02) | (0.02) | (0.02) | (0.01) | (0.01) | (0.01) |
| Descriptive | 0.00 | -0.11 | -0.13 | 0.00 | 0.04 | 0.06 |
| | (0.00) | (0.09) | (0.10) | (0.00) | (0.08) | (0.08) |
| Injunctive | 0.00 | -0.09 | -0.09 | 0.00 | 0.01 | 0.02* |
| | (0.00) | (0.06) | (0.06) | (0.00) | (0.01) | (0.01) |
| Stage 2 × Descriptive | 0.00 | 0.00 | 0.00 | 0.07* | 0.05* | 0.05* |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| Stage 2 × Injunctive | 0.11* | 0.09*** | 0.09*** | 0.09** | 0.07*** | 0.07*** |
| | (0.03) | (0.03) | (0.04) | (0.02) | (0.03) | (0.03) |
| Free day | | -0.09 | -0.11 | | 0.08 | 0.10 |
| | | (0.09) | (0.11) | | (0.08) | (0.08) |
| Nutri-Score reference | | 0.09*** | 0.06** | | 0.06** | 0.08* |
| | | (0.02) | (0.02) | | (0.03) | (0.04) |
| Female | | 0.10** | 0.07** | | 0.04 | 0.03 |
| | | (0.04) | (0.03) | | (0.10) | (0.10) |
| Participant's age | | 0.01 | 0.01 | | 0.01*** | 0.01*** |
| | | (0.01) | (0.01) | | (0.00) | (0.00) |
| Child age | | -0.01*** | -0.02*** | | -0.02*** | -0.02*** |
| | | (0.00) | (0.00) | | (0.00) | (0.00) |
| Number of child | | 0.07*** | 0.07*** | | 0.06*** | 0.04* |
| | | (0.02) | (0.02) | | (0.02) | (0.03) |
| Body Mass Index | | | | | | |
| Normal weight | | Ref | Ref | | Ref | Ref |
| Underweight | | 0.05 | 0.04 | | 0.00 | 0.00 |
| | | (0.15) | (0.13) | | (.) | (.) |
| Overweight | | -0.03 | -0.00 | | -0.02 | -0.02 |
| | | (0.07) | (0.08) | | (0.02) | (0.03) |
| Education level | | | | | | |
| No diploma | | Ref | Ref | | Ref | Ref |
| Cap-bep | | 0.51*** | 0.45*** | | -0.07 | -0.07 |
| | | (0.09) | (0.06) | | (0.09) | (0.06) |
| High school degree | | 0.40*** | 0.41*** | | -0.01 | -0.01 |
| | | (0.04) | (0.05) | | (0.09) | (0.06) |
| Bachelor's degree | | 0.41*** | 0.36*** | | -0.05 | -0.10 |
| | | (0.10) | (0.10) | | (0.11) | (0.13) |
| Master's degree | | 0.45*** | 0.41*** | | -0.06 | -0.12 |
| | | (0.09) | (0.07) | | (0.10) | (0.09) |
| PhD | | 0.41*** | 0.40*** | | 0.10 | 0.00 |
| | | (0.13) | (0.10) | | (0.12) | (0.11) |
| Others | | 0.25*** | 0.22*** | | -0.12 | -0.16*** |
| | | (0.04) | (0.03) | | (0.09) | (0.05) |
| Child meeting PNNS' recommendations | | | | | | |
| First quartile | | Ref | Ref | | Ref | Ref |
| Second quartile | | 0.06 | 0.05 | | 0.12** | 0.09 |
| | | (0.07) | (0.06) | | (0.06) | (0.07) |
| Third quartile | | -0.03 | -0.05 | | 0.22*** | 0.20*** |
| | | (0.07) | (0.06) | | (0.07) | (0.06) |
| Fourth quartile | | 0.11* | 0.10 | | 0.20*** | 0.19*** |
| | | (0.07) | (0.07) | | (0.08) | (0.07) |
| Food risk lover | | | -0.01 | | | -0.02 |
| | | | (0.01) | | | (0.02) |
| Future food effects | | | 0.03*** | | | 0.02 |
| | | | (0.01) | | | (0.02) |
| Constant | 0.47*** | -0.34 | -0.37 | 0.41*** | -0.01 | -0.06 |
| | (0.00) | (0.24) | (0.27) | (0.00) | (0.12) | (0.09) |
| N | 151 | 148 | 148 | 149 | 140 | 140 |
| Observations | 302 | 296 | 296 | 298 | 280 | 280 |

Notes: Robust standard errors clustered at the time slot level in parentheses. Columns (1) and (4) show the results of an OLS model with fixed effects and columns (2), (3), (5) and (6) the results with random effects.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
We lose 12 observations when we introduce Socio-demographic variables, including 3 who did not give their gender, 8 who did not give either their weight or their height, and 1 who did not give his gender nor his weight and height.

## Appendix C. Sample size.

We conduct a power analysis to determine the appropriate sample size, drawing on available evidence from the literature. Performing power calculations from the literature requires prior information about features of the data (i.e., mean, proportion, variance, and distribution) of the main outcome. However, as noted by Vasilaky and Brock (2020), studies often do not report all data features consistently, and some parameters may be missing for certain sub-samples of interest. To perform the power calculation, we rely on two papers that, to the best of our knowledge, are the most comparable to ours in terms of measures of outcomes or analytical methods. Crosetto et al. (2020) conducted a randomized controlled trial to study the effect of five front-of-pack nutrition labels on the nutritional quality of food purchases. They measure the nutritional quality of food baskets using the FSA score, as we do in our study. Their findings show an improvement in the average nutritional quality of food baskets ranging from 1.513 to 2.766 points (reductions in FSA score between 1.513 and 2.766) across label treatments. Marette et al. (2016) examine how a simple nutritional message about vitamin and sugar content influences mothers' and their children's choices between relatively healthy foods (flasks of stewed apples) and relatively unhealthy foods (candy bars). Dyads are asked to fill a bag with five products for which six combinations were possible (e.g., one flask and four candy bars, or three flasks and two candy bars, etc.). They find that, after receiving the nutritional information, the average increase in choosing healthy food items for themselves is 1.330 for children compared to 0.803 for mothers. We base our power calculation on the data reported in Crosetto et al. (2020) and Marette et al. (2016). For Crosetto et al. (2020), who test the impact of five front-of-pack labels, we rely on the label (NutriCouleur) that showed a statistically significant effect with the smallest impact on the outcome (FSA score). Using those two benchmarks, we calculate that detecting such effects with 80% power at the 5% significance level would require approximately 7 to 25 participants per treatment. Since we do not identify other studies that are directly comparable to ours in terms of both the measures of outcome used and the analytical methods applied, we cannot rely on closer

benchmarks for determining the sample size. To account for this limitation and the uncertainty in the existing evidence, while also ensuring sufficient statistical power to detect meaningful effects, we include an average of 50 participants per treatment. This choice reflects a prudent approach in determining the sample size, as it places our sample well above the range suggested by the power calculations from the literature (7 to 25 participants). By doing so, we reduce the risk of underpowered tests, increase the robustness of our estimates, and allow for potential heterogeneity across sub-groups that may otherwise be difficult to capture.

The computation of the sample is done with a two-sample means test with 80% power at the 5% significance level. In our case, the two studies we use to compute the sample size do not report the standard deviations. Vasilaky and Brock (2020) explain that "in this case, Stata uses an estimate of 1 for the unknown standard deviation. The user can override the default by adding the option knownsds to the command line. This default changes to a z-distribution if the study design will lead to clustered error terms, which is common in field experiments." Here, we add the option knownsds in the Stata command. The results are summarized in Table C1.

Table C1: Estimated sample size from the literature.

| Papers | Outcomes | Values of the outcome | Estimated sample size |
|---|---|---|---|
| Marette et al., (2016) | Average Number of Healthy Items (ANHI) in the food basket | Before information: ANHI = 2.617 After information: ANHI = 3.420 | 27 participants per treatment |
| Crossetto et al., (2020) | FSA score of the food basket | Control group: FSA = 0.12 Treatment NutriCouleur: FSA = -1.40 | 8 participants per treatment |

## Appendix D. Treatment of eating habits and score of following the recommendations of the PNNS.

The question asked for all food categories except snacking is: on average, how often do you (does your child) eat this category?

◯ every day

◯ 4 to 6 times a week

◯ 2 to 3 times a week

◯ 1 time a week or less

◯ never

All answers are expressed in weekly frequency (number of days per week) as follows (except snacking):

every day = 7 ; 4 to 6 times a week =5 ; 2 to 3 times a week = 2.5 ; 1 time a week or less = 1 ; never =0.

For **snacking** question asked is: on average, over the past month, have you (has your child) been snacking?

◯ several times a day every day

◯ Once a day, every day

◯ Once or twice a week on average

◯ very rarely

◯ never

All answers are expressed in weekly frequency (number of days per week) as follows: several times a day every day = 10.5[23] ; Once a day, every day = 7 ; Once or twice a week on average = 2 ; Very rarely = 0.5 ; never = 0.

Let's denote by $X$ the weekly quantity consumed by an individual for a given food category, the method used to construct the score of following the recommendations of the PNNS is summarized in the table below.

[23] 10.5 = 7 * 1.5, we have multiplied the 7 times a week by 1.5 and not by 2 or more to avoid the weighted score (overall eating habits score) of the participants being biased by snacking.

Table D1: Summary of score construction

| Food categories | PNNS recommendations | Score of food categories |
|---|---|---|
| Fruits and vegetable | 5 fruits and vegetables a day | $score_{f\&v} = \frac{X}{7}$ |
| Dairy products | 2 dairy foods a day | $score_{milk} = \frac{X}{7}$ |
| Starchy food | at least one starchy food a day | $score_{starchy} = \frac{X}{7}$ |
| Fish and seafood | twice a week | $score_{f\&s} = \begin{cases} \frac{X}{2} & if \quad X \leq 2 \\ \frac{2-X}{2} & if \quad X > 2 \end{cases}$ |
| Unprocessed meat | around 3 or 4 steaks a week | $score_{meat} = \begin{cases} \frac{X}{4} & if \ X \leq 4 \\ \frac{4-X}{4} & if \ X > 4 \end{cases}$ |
| Sweetened beverages | no more than one glass a day | $score_{sweet} = \frac{1-X}{7}$ |
| Processed food | avoid eating processed foods | $score_{processed} = \frac{-X}{7}$ |
| Snacking | avoid snacking | $score_{snack} = \frac{-X}{7}$ |

Score of meeting the recommendations of the PNNS = $score_{f\&v} + score_{milk} + score_{starchy} + score_{f\&s} + score_{meat} + score_{sweet} + score_{processed} + score_{snack}$