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Are children more paternalistic than their mothers when choosing snacks?

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Abstract

This paper focuses on an experiment in which mothers and their child separately chose between relatively healthy foods (flasks of stewed apples) and relatively unhealthy foods (candy bars). Each participant first filled up a bag for her/himself, and, second, one for the other person of the dyad. A simple nutritional message on vitamins and sugar contents of foods was then revealed, and subsequently, each participant filled up a third bag for her/himself and a fourth one for the other person of the dyad. Results show that, before the revelation of the nutritional message, mothers are, on average, *öindulgentö*, which means that they choose a lower number of relatively healthy foods for their child than the one they choose for themselves. Children tend to be rather *öpaternalisticö*, which means that they choose a higher number of relatively healthy foods for their mothers than the one they choose for themselves. The simple nutritional message leads many participants to significantly increase the number of relatively healthy foods selected for themselves and for the other person of the dyad. As children react more to the message when choosing snacks for themselves than for their mother, children become more indulgent after the message, even if they are still less indulgent than their mothers. The mothers' indulgence does not significantly change with information.

Keywords: Behavioral economics, food choice, nutritional message, paternalism, children.

JEL Classification: C92, D19

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Introduction

There are rising concerns about the low acceptance of healthy foods by children and their preferences for high-sugar and/or high-fat foods (see for instance Cooke and Wardle, 2005). As a response, parents may sway their children's habits both implicitly and explicitly. Parents' diet can implicitly influence their children through modeling (Tibbs, 2001) or covert control, like not buying sweets (Ogden, 2006). They can also explicitly impact their children's behavior through their parenting practices such as praising, negotiating, pressuring to eat healthy foods, or by overtly restricting access to less healthy foods (Vaughn et al., 2013).

Parents' decisions for their children can be driven either by their view about nutrition, including the long-term effects of eating habits, or by their desire to immediately satisfy their children's preferences. Nutrition education via a public policy is another explicit tool to modify eating habits. Understanding food choices during childhood is important, since these choices are quite persistent and could have long-term impact on weight and health status, and consequently on well-being (Nicklaus et al., 2005).

This paper aims at focusing on a decision-making environment in presence of family members, by examining parents' and children's preferences regarding relatively healthy and unhealthy snacks, and allowing the identification of factors affecting these choices.

This paper analyses the choices of snacks by using data from an experiment with family dyads, including one mother and her child recruited in Dijon area (France). The experiment was designed to determine preferences for relatively healthy versus relatively unhealthy (but tasty) foods, which is obviously important for nutrition. This trade-off between a current benefit (pleasure) and a future benefit (health) is crucial in research involving time inconsistent preferences, as underlined by O'Donoghue and Rabin (1999) and List and Samek (2014).

During our experiment, each mother and each child had to separately choose between relatively healthy foods (flasks of stewed apples) and relatively unhealthy foods (candy bars), and fill up take-home bags. For each bag to fill up, each participant had to select five products between healthy and unhealthy foods. First, each participant filled up a bag for her/himself; second, a bag for the other person of the dyad. A simple nutritional message on both types of food was then revealed to participants, and subsequently, each of them filled up a third bag for her/himself and a fourth one for the other person of the dyad. At the end of the experiment, each

participant received one bag randomly determined among the different bags filled up by each member of the dyad (mother or child), which corresponds to an incentives-based mechanism.

With this experimental design, participants' choices can be characterized as paternalistic or indulgent. When a participant chooses a higher number of relatively healthy foods for the other person of his/her family, as compared to his/her own choice, the behavior is characterized as paternalistic, since the participant is prescribing healthier options for others than (s)he personally prefers. By contrast, if an individual chooses a lower number of relatively healthy foods for the other person as compared to his/her own choice, the behavior is characterized as indulgent.

Results show, first, that before the revelation of the nutritional message, mothers are, on average, indulgent, choosing a lower number of relatively healthy foods for their child than for themselves. Second, children tend to be more paternalistic, choosing a higher number of relatively healthy foods for their mother than for themselves. Third, individual choices for themselves performed by mothers and children are significantly associated with liking of the foods and with individuals' expectations about other member of the dyad's choices for this individual, underlining an indirect influence of the other member of the dyad. Fourth, a simple nutritional message leads many participants to significantly increase the number of relatively healthy foods for themselves and for the other person of the dyad. As children react more to the message when choosing snacks for themselves than for their mother, children become more indulgent after the message, even if they are still less indulgent than their mothers. The mothers' indulgence does not significantly change with information. Eventually, the econometric estimations show that the paternalism elicited before the message is a significant predictor of the participants' reactions towards more healthy products for themselves, after the revelation of the nutritional message.

Our paper contributes to the behavioral literature focusing on food choices by children.¹ In particular, some recent field experiments by Belot and James (2011), List and Samek (2014) and Maimaran and Fishbach (2014) studied some regulatory interventions in schools or in daycares. In particular, Maimaran and Fishbach (2014) underlined a negative impact of several

¹ Our paper is also related to the few experimental studies involving children and parents together, even if these papers do not focus on food choices. For instance, Cipriani et al. (2013) focuses on the transmission of public values between parents and children. Our experiment focuses on real choices, which also differs from studies where parents were asked about their motivations for choosing foods for their children (as for instance Rigal et al., 2012).

specific persuasive health messages on carrot consumption by preschoolers. Moreover, List and Samek (2014) showed that the introduction of small incentives significantly increased take-up of healthy snacks, while educational messaging alone had little influence on food choices.

These field experiments organized in real contexts only focus on children's behaviors and fully abstract from parents' behaviors. Our paper is therefore a novel contribution, as it examines mothers and children choices for two specific products in the lab, allowing a precise control of both dyads strategies and revealed information. Our experiment offers a new design and precisely isolates participants' choices for themselves and for the other member of their family, which is particularly difficult to study in a natural field experiment.² Moreover, our paper leads to different results, since the revelation of the nutritional message leads to a significant increase in the healthy foods choice by children.³

Our experiment with mothers and children deciding for themselves and for the others also differs from previous experimental contributions on paternalism, evaluated in the lab with only adult participants.⁴ In particular, in a study by Jacobsson et al. (2007), adults made choices for other adults. Using dictator game-like experiments, they found that people were more apt to give nicotine patches to diabetic-smokers rather than an equivalent amount of cash, which suggests that altruism is predominantly paternalistic. Lusk et al. (2014) examined how choices between a relatively healthy food (apple) and a relatively unhealthy food (cookie) are influenced by participants' role, namely, either paternalists choosing for "anonymous others" or participants receiving the choice of paternalists. They found that most participants receiving the choice of paternalists prefer to make their own choices, even after learning that paternalists choosing for "others" were better informed about their choices than they were themselves.

² To the best of our knowledge, only Gram (2014) examined dyad food choices in the field with ethnographic perspective, based on the observation of food negotiation between parents and children. This paper does not use a field protocol with both control and treatment groups, and it does not use an econometric analysis.

³ In real situations, many parameters like the intensity in the diffusion of informative campaigns, the content of advertising campaigns dedicated to children highly matter and are not taken into account by lab experiments. Field experiments shows that imperfect recall, lack of time before purchasing or consuming, the great number of purchased products or/and confusion about complex information characterize the feelings of many consumers. Conversely, the lab context is useful for eliciting well-informed, thoughtful preferences.

⁴ On the theoretical side, our paper differs from models studying procrastination and paternalistic regulations (see particularly O'Donoghue and Rabin, 1999, 2001 and 2003). Moreover, various forms of paternalism have emerged for trying to combine long-term well-being with a relative freedom of citizens (see Camerer et al. 2003; Loewenstein et al. 2007; Thaler and Sunstein 2003). Theoretical studies cannot directly capture the difference between parents and children, while our experiment clearly identifies parents and children.

Our paper differs from these two previous papers on paternalism, as (1) we recruited children and mothers, and (2) successive choices of mothers and children were fully *ösymmetricö*, excluding dictator game-like experiments, but allowing children to express their real decision-makers role.⁵ In our paper, all participants successively chose for themselves and for the other member of their family, which leads to a complete characterization of paternalism and indulgence.

This paper is organized as follows. In the next section, we describe the experiment we designed to investigate this issue. The following sections present results related to choices and results characterizing paternalisms and indulgence among participants. The last section concludes.

1. Methods and Procedures

1.1. Participants

Participants were recruited from a population registered in the *Chemosens Platform's PanelSens* database⁶, accounting for around 10,000 households in Dijon. We sent series of mails to an *a priori* targeted population. We were searching for dyads composed of a mother and a child with some specific criteria related to primary school. We only recruited mothers because a vast majority of women spending more time on food shopping and meal preparation than men in households (Ricroch, 2012). We targeted children in primary grades CE1, CM1 and CM2 (the last years of primary schools in France). Thus, targeted children were mainly between 9 and 11 years old, guaranteeing an *a priori* good level of reading and an absence of teenagers older than 12 years. We also imposed some additional criteria linked to a simplified quota method ensuring for socio-economic representativeness of households in Dijon area. In the mail of recruitment, we mentioned that we will offer a 20 show-up fee to the mother for a 45 minutes session hosted at INRA laboratory. Interested mothers with available children to constitute a dyad contacted the INRA for registering to a session compatible with their time schedule.⁷

⁵ With the assumption of *ösymmetricö* participants, we also abstract from an evaluation of the authority that could be measured with an authority-delegation game (Fehr et al., 2013).

⁶ This database has been declared to the relevant authority (Commission Nationale Informatique et Libertés - CNIL - n° d'autorisation 1148039).

⁷ The experiment was conducted according to the guidelines established in the Declaration of Helsinki. The study protocol was approved by the local ethics committee, namely the *Comité de Protection de Personnes Est I*

A total of 111 dyads attended the experiment and sessions were run with a maximum of five dyads per session. Table 1 shows the socio-demographic characteristics of the sample. On average children were 10.05 years old, with 55 girls and 57 boys (one mother came with her twins explaining the total of 112 children).

[Insert Table 1]

1.2. Products

During the session, each member of the dyad (mother and child) were separately choosing between respectively relatively healthy foods (flasks of stewed apples) and relatively unhealthy foods (candy bars). For the rest of the paper and for simplicity, we give up the term "relatively", even if the reader should keep in mind that the characterization of healthy versus unhealthy is relative and comes from the products comparison. Popular brands in France were offered to participants, namely flasks of stewed apples were *Pom'Potes*, and the candy bar was a *Kinder Bueno bar*. The bottom of table 1 shows that average score of liking for each food, with mothers giving a higher score for the healthy foods than for the unhealthy foods. Surprisingly, for children, the average score of liking is almost the same for both foods, which means that the liking is also observed for the healthy food.

Each participant had to successively fill up four transparent bags, each with five products chosen between healthy and unhealthy foods (see bottom of Figure 1). We chose bags to fill up with five products for sake of simplicity, and also for reinforcing concreteness of choices, which is very important for children. In order to fill the bags, 15 products of each food were initially presented in two baskets on each individual table (see the top of picture 2 of Figure 1). New baskets of 15 products were given to each participant before choosing the third bag at mid-session, as to avoid a scarcity effect (participants could have been influenced in their last choices by a relatively empty basket).

[Insert Figure 1]

Bag choices were real and consequential, since each participant received at the end of the experiment one randomly selected bag out of the four previously chosen bags.

Bourgogne, no. 2014-A00024-43. Written and informed consent was obtained from both parents, and from the children. The information and consent form was adapted for children, but it contained the same information than for the parents.

1.3. Sessions

The experiment was conducted in multiple sessions in a tasting room of the *Chemosens* platform located in Dijon, Burgundy, France, in April 2014. The team in charge of running the experiment consisted of one speaker and one speaker assistant. A female and a male experimenters were alternated across sessions as to read the experimental instructions.

Each session lasted 45 minutes as to *a priori* take into account the possibility of limited attention by the children. The mothers were located on one side of the room, and their children were located on the other side of the room (see pictures 1 and 2 of Figure 1). Members of the dyads were identified with a same number as to guarantee anonymity of replies, and with specific indications entitled "Mother" or "Child". In the experimental room, the location of the members of the same dyad was symmetric relatively to the wood panel separating children and mothers. Communication between participants was not allowed during the session.

The successive steps of a session can be summarized as following.

Experiment Step 1. Instructions

Once everybody entered the room and seated in silence, oral instructions were provided. The speaker explained that each participant will have to fill up several bags with foods. We clearly explained how to fill up a bag with five products (see bottom of Figure 1). With five products per bag, six combinations were possible, namely $\{(0 H, 5 U), (1 H, 4 U), (2 H, 3 U), (3 H, 2 U), (4 H, 1 U), (5 H, 0 U)\}$ with H denoting the healthy food and U denoting the unhealthy food. The six possible combinations of products were clearly explained by using a concrete example with two other foods (namely, a cheese snack, Kiri® Goûter versus a yogurt snack, Pøtit Yop), for avoiding any organizers' influence on subsequent choices of foods of the experiment. Indeed, the assistant of the speaker was successively filling up a bag for each combination. The random selection was also clearly explained with a demonstration. To avoid confusion about the bags allocation, we only explained in this step that the bags will be filled up for themselves, by omitting the choice for others only introduced in step 3.

We also explicitly mentioned to the participants that they were free to make their choices according to their preferences. We emphasized the absence of good or bad choices, because only individual choices mattered. We also mentioned that successive choices could differ or be identical to previous choices. Eventually, we asked if participants need clarifications related to

the instructions. Indeed, very few participants asked questions. After these explanations, the experiment started.

Experiment Step 2. Decision for Oneself

Each participant started by filling up the first bag (#1) for her/himself with five products. Each mother and each child separately chose between healthy foods (flasks of stewed apples) and unhealthy foods (candy bars). Once filled up by a participant, the bag #1 was picked up by the experimenters. The bag #1 was laid down on an adjacent table dedicated to each participant. This was done by one experimenter for all participants before turning to step 3 for checking that all participants selected five products in their bag. All participants were waiting in silence for the end of step 2. This step belongs to the round #1 gathering choices before the message revelation.

Experiment Step 3. Decision for Other

For this step 3 related to the bag #2, participants were placed in the role of the chooser for the other member of their dyad, namely a choice for her child by the mother, and a choice for her/his mother by the child. We clearly and carefully explained that this second bag with five chosen products was for the other person in the dyad. Participants were informed that this decision made for the other person could be given to the other person of their family, if token #2 was randomly selected at the end of the session.

After this new instruction, each participant filled up the bag #2 with five products. Once filled up by a participant, the bag #2 was picked up by the experimenters and laid down on the adjacent table dedicated to this participant. This last procedure was realized for all participants, guaranteeing that all participants selected five products in their bag #2. After this choice, we asked every participant to make a guess about the content of the bag filled up by the other person of the dyad (i.e. we elicited their expectations regarding the choice made by the other member of the family for themselves), and to write their answer on a paper sheet. We picked up all paper sheets. This step also belongs to the round #1 gathering choices before the message revelation. Eventually, new baskets with 15 flasks of stewed apple and 15 candy bars were given to each participant.

Experiment Step 4. Information

To facilitate the understanding of the message by children, a short message was selected. According to Wansink (2004), a short message is likely to be very efficient. Our message compared both foods offered to participants, and explicitly mentioned vitamins and sugar,

concepts that may be *a priori* understood by the recruited children (Contento, 1986; Contento et al. 2002). Information about the nutritional content of products was read aloud in French as following: «Please listen to the following information:

The *Pom'Potes* have more vitamins and less sugar than the *Kinder Bueno*.

The *Pom'Potes* are better for health than the *Kinder Bueno*»

The speaker repeated aloud this message another time.

Experiment Step 5. Repeat Decision for Self

After the nutritional message was read aloud by the speaker, participants filled up a new bag (#3) with five products for themselves. We insisted on the fact that this bag was dedicated to themselves if the random selection was to lead to bag #3. Once filled up by a participant, the bag was picked up by the experimenters and laid down on the adjacent table dedicated to this participant. This last procedure was realized for all participants. This step belongs to the round #2 gathering choices after the message revelation.

Experiment Step 6. Repeat Decision for Other

Participants filled up a new bag (#4) with five products for the other person of their family (round #4 of choices). We insisted on the fact that this bag was dedicated to other member of the family if the random selection was to lead to bag #4. Once filled up by a participant, the bag was picked up by the experimenters and laid down on an adjoining table dedicated to this participant. This last procedure was realized for all participants. This step also belongs to the round #2 gathering choices after the message revelation.

Experiment Step 7. End of the Experiment

At the end of the experiment, participants completed an exit questionnaire on related issues and socio-demographic characteristics. The exit questionnaire for mothers was focusing on preferences related to the two products of the experiment (as shown at the bottom of table 1) and socio-demographic characteristics of households. Mothers were also asked to answer to questions about their motivations when buying snacks for their children.⁸ The children's exit

⁸ These last questions related to characteristics are the following: « When I purchase a snack for my child I pay attention to the following characteristic: » with a scale from 1: completely false to 5: completely true. For the characteristics, the questions come from the «Child Food Motivation Questionnaire» (see Rigal et al., 2012), except the question «Easy to cook» which was replaced by «Easy to eat» in order to better fit with the type of foods used in the present experiment, e.g. snacks. Four other questions were added: «Source of pleasure», «Rich in energy», «from a known brand», «nourishing feeling»

questionnaire was focusing on preferences related to the two offered foods (as shown at the bottom of table 1), and to the maternal feeding practices regarding restrictions and pressure-to-eat (Monnery-Patris et al, 2011).⁹ The different questionnaires were filled out on paper sheet rather than on computers, as to facilitate children's responses.

The experiment ended by randomly selecting one bag for each participant, namely one for every child and one for every mother.¹⁰ The \$20 show-up fee was given to the mother. Once all participants left the experimental room, the content of all four bags were reported on paper sheets by the speaker and double-checked by the speaker assistant.

2. Results

This section successively presents the participants' choices and the characterization of the indulgence and paternalism among participants.

3.1. Result 1: mothers' and children's choices before the nutrition message

In this paper, we choose to focus on results concerning the choices of healthy products (namely, flasks of stewed apples) by participants. Let us remind that the choice of unhealthy products (namely, candy bars) is the complement of chosen healthy products relatively to five, since five products were selected in each bag.

We first present choices of healthy products made by mothers and children. Figure 2 shows average choices by mothers on the left chart and by children on the right chart. For each chart, the rounds are represented on the X-axis, with round #1 gathering choices related to bags #1 and #2 before the revealed information and round #2 gathering choices related to bags #3 and #4 after the revealed information. The average numbers of chosen healthy products are represented on the Y-axis. Moreover, in figure 2, the indicators point out the significant differences (1) between choices for different rounds and (2) between choices for oneself and choices for the other person of my family for a same round. We test for significant differences of choices by using the Wilcoxon test for paired samples and indicate the significant differences at the 1%, 5%, and 10% levels.

⁹ In this experiment children were only asked to answer about maternal practices as only mothers participated to the study.

¹⁰ The randomly selected bag remained on the table and the new equivalent bag was filled up by the organizer as to be given to the participant and allow the experimenters to keep track of the choices.

[Insert Figure 2]

Figure 2 shows the average choices of participants for themselves, reported by the plain curve, and the average choices made by participants for the other member of their family, reported as the dashed curve.

Our *first* result shows that across the two information conditions, mothers significantly choose a higher number of healthy foods for themselves than the one they selected to be given to their children (left chart). On the contrary, our *second* result shows that before the revelation of information, children significantly choose a lower number of healthy foods for themselves than for their mothers (right chart). After the revelation of the nutritional information, children's choices for themselves and for their mother are on average almost equivalent. . This question of different choices for self and for the other will be detailed in the next section.

Before turning to the evaluation of the impact of the nutritional information, it is important to focus on the left part of the plain curves of both charts. Our *third* result shows that, before the nutritional message, the mothers' choices of healthy foods for themselves (with an average of 2.62 on the left chart) are significantly higher than the children's choices of healthy foods for themselves (with an average of 1.98 on the right chart) with the Wilcoxon paired sample test characterized by $Z = 3.93$ and $P = 0.0001$.

3.2. Result 2: the impact of the nutritional message on choices

First, as shown in Figure 2, the nutritional message on the vitamins and sugar contents of foods significantly leads mothers and children to choose a higher number of healthy foods for themselves and for the other person of the dyad. This information has the strongest influence on the selection of children for themselves.¹¹ The average increase in the choice of the healthy food for themselves is equal to 1.330 for children versus 0.803 for mothers. In other words, when choosing products for themselves children react more to the information than their mother (a result confirmed by econometric estimations in tables 2 and 3). When focusing on points on the

¹¹ Maimaran and Fishbach (2014) show a negative impact of certain persuasive health messages on carrot consumption by preschoolers (between 3 and 5.5 years old) in YMCA daycares. Our paper leads to a different result, since our nutritional message leads to a significant increase of the healthy food choice by children after the revelation of information. One possible explanation regarding the difference of results consists in the age of the children. Maimaran and Fishbach (2014) consider preschoolers, while we consider older children (between 9 and 11 years old) who are *a priori* able to internalize messages about the link between food and health.

right of the plain curves, these reactions to information explain why the mothers' choices of healthy foods for themselves (with an average of 3.42 on the left chart) are becoming statistically equivalent to the children's choices of healthy foods for themselves (with an average of 3.31 on the right chart), with the Wilcoxon paired sample test characterized by $Z = 0.68$ and $P = 0.49$. In other words, the nutritional message brings children closer to their mothers.

[Insert Figure 3]

Our *second* result is pictured in Figure 3 which directly derives from Figure 2, but it alternatively represents the possible bags that participants may receive at the end of the experiment with the random selection among the four selected bags. On average, for a given round, contents of bags that can be received by a participant either because of their own choice or because of the choice made by the other member of the family are relatively close. The only exception concerns the statistically significant difference between the received foods by children coming from their choice and the ones received from their mothers after the revelation of information (see the 2 points related to round #2 on the right of the right chart). This difference after the revelation of information suggests that mothers underestimate the children's reactions to the nutritional message. This underestimation invites us to carefully study the variables influencing choices made by mothers and children.

3.3. Result 3: the variables influencing the mother's choices

Tables 2 and 3 show how choices of healthy foods for themselves, respectively made by mothers and children, are affected by food liking, socio-demographic characteristics and information. The ordered probit model is tailored to our configuration, since the six possibilities of choices between foods selected in the bag correspond to an ordinal dependent variable. The dependent variable is ranked as following: 0 healthy food, 1 healthy food, ..., 5 healthy foods. While these categories of response $y=s$ implies a precise measurement equation, there exists an unobservable latent variable y^* such that $\mu_{s-1} < y^* < \mu_s$ for every $s=\{1,..,6\}$ and $y^* < \mu_0$ for $s=0$. The latent variable is characterized by $y^*=x\beta + \epsilon$, where x is the vector of independent variables, and β is the vector of regression coefficients to estimate, while ϵ is the vector of independent errors. The ordered probit technique uses the observations on y , for estimating coefficients via the maximum likelihood procedures. With the ordered probit procedures, there is no intercept, but instead five estimates of μ_s for $s=\{1,..,6\}$, with $s=0$ being the variable of normalization.

Tables 2 and 3 present the ordered probit estimations of healthy foods before the revelation of the message in column 1, after the revelation of information in column 2, and according to a combined way pooling all observations in the third column. Before the revelation of information in column 1, we tested for the influence of almost all variables collected in the exit questionnaires. For sake of simplicity in the presentation of table 2 and table 3, we re-ran regressions with only variables characterized by a statistically significant coefficient in column 1. The only exceptions for which we kept the non-significant coefficients in all columns are the five coefficients μ_s . In column 2, we kept the variable of column 1 and added some relevant variables related to the round #2. In column 3, data before and after information were stacked and we added a dummy variable related to the revelation of information (namely equal to one for observations in round#2). In both tables 2 and 3, a positive estimated coefficient implies that when the associated variable increases the choice of healthy foods is more likely.

[Insert Table 2]

Table 2 focuses on the mothers' choice of healthy foods for themselves related to bags #1 and #3. Before information, as shown in the first column of table 2, "numerous" variables significantly influence choices, which explains, compared to other experimental studies, the relatively high pseudo R^2 for 110 participants (2 participants were omitted because of missing data). The chance of choosing healthy products for themselves is positively influenced by their choice made for their children with their selected bag #2, and by their expectation about what their child has chosen for them with her/his selected bag #2 (top of table 2). This result could be due to the fact that products could be considered as well appropriate for children. The reader must keep in mind that this choice of bag #2 and this question about expectation were asked right after the choice of bag #1. In other words, for their own choice of bag #1 at the beginning of the session, mothers implicitly internalize what they would give to their children, and how they expect their children to react with regard to their preferences (via the guess about the bag#2 selected by the child). Let us remind from the previous section that in the initial instructions (see *Experiment Step1. Instructions*), we only explained that the bags will be filled up for themselves, by omitting the choice for others only introduced in step 3 with the bag #2. The main reason for this choice was the concern to avoid confusion in the initial explanations regarding the bags allocation for the participant or for the other.

In addition, in column 1, the liking of products declared in the exit questionnaire also influences the choice of healthy products before the revelation of information in a consistent way, namely negatively with the liking of the unhealthy product and positively with the liking of the healthy product. Eventually, in column 1, some socio-demographic variables and some criteria related to the mother's motivations for buying snack for their child also influence the probability to select healthy products. The more the mothers pay attention to convenience and to their child preferences, the lower the probability they choose healthy foods. On the contrary, the more the mothers pay attention to the vitamin content of the snacks, the higher the probability they choose healthy foods.

The statistical significance of several variables in column 1 persists after the revelation of the nutritional message as shown in column 2. This is the case for the liking of both products and for the criterion related to the absence of conflicts in the choice of snacks that still has a negative impact. The chance of choosing healthy foods for themselves is positively influenced by their choice made for their children with their selected bag #4 at round #2, and their expectations about what their child has chosen for them with her/his selected bags #2 and #4. By combining data before and after information, the last column shows that information significantly increases the mother's chances to choose healthy foods as shown in Figure 2.

3.4. Result 4: The variables influencing the children's choices

Table 3 focuses on the children's choice of healthy foods for themselves related to bags #1 and #3. Compared to table 2 focusing on mothers, fewer variables significantly influence choices of children, which explain relatively lower pseudo R^2 compared to the ones of table 2. In particular, for children, the second choice (bag #2) or the fourth choice (bag #4) selected for their mother do not impact the children's choice for themselves, which means that they implicitly did not think to their mother when they initially chose the bag #1 for themselves, and/or they distinguished between their choice and the one for their mother.¹² The variables linked to the parental feeding

¹² This result of the absence of strong influence of mothers also mitigates the criticism of lab experiment by List and Levitt (2007) underlining several limits from the lab experiment. Because experimental subjects know they are being observed by organizers in experiments, results from the lab may fail to reflect the reality. We could think that this effect could be more salient with our study, since children were coming with their mother who is another observer, but this salience did not happen. Conversely our study seems to confirm Falk and Heckman (2009) who insist on the advantages of the lab allowing for tight control of both, environments and participants' actions. The

practices of restriction and pressure-to-eat asked at the end of the questionnaire for children (as described in note 8) were not statistically significant. We re-ran regressions without these variables for getting the table 3. As shown in table 3, before the nutritional message (first column), their expectation about the mother's choice of the bag #2 for them plays a significant role. Surprisingly, the mother's influence on children's choices appears via the mother's choices of bag #2 for children. Nevertheless, these effects are fragile, since they disappear after the revelation of information (columns #2 and #3). Eventually, note that the child gender and their snack habits coming from the exit questionnaire did not impact their choices, leading us to re-run final regressions of table 3 without these variables.

[Insert Table 3]

Whatever the context of information (and the column) in table 3, the child's expectation about their mother's choice for her/him and the liking of products, declared in the exit questionnaire, significantly influence the probability of choosing healthy products. In particular, the impact of the liking of the unhealthy product is negative, and the impact of the liking of the healthy product is positive.

The last column of table 3 shows that revealed information, epitomized by the dummy variable "Information", significantly increases the children's probability to choose healthy foods for them. Interestingly, the estimated coefficient of the dummy variable "Information" is higher for children (0.936) than the equivalent coefficient for mothers in table 2 (0.441). This comparison confirms the strongest effect for children visible in Figure 2. After characterizing participants' choices, we now turn to the indulgence or the paternalism exhibited by participants.

3.5. Result 5: Indulgent or paternalistic behaviors

One strength of our design is the possibility to compare the chooser's bags filled up for himself/herself with the bag filled up for the other member of his/her family. In particular, the difference between these choices indicates whether the chooser gave healthy or unhealthy choices to others as compared to himself/herself. Thus, this experiment enables us to characterize mothers and children's behavior as paternalistic, indulgent or neutral. When a participant chooses a higher number of healthy foods for the other person of their family as compared to

tight control of actions is the linchpin of our experiment with participants choosing for the other member of their family.

his/her own choice, the behavior is characterized as paternalistic. When an individual chooses a lower number of healthy foods for the other person as compared to his/her own choice, the behavior is characterized as indulgent.

[Insert Table 4]

Table 4 shows some statistics related to the difference between the choice for the other person and the choice for oneself, which is a measure of the indulgence and paternalism. A first view of this table shows that *children are significantly more paternalistic than mothers*, because of significant higher values for children than for mothers in each column. Results of table 4 can be nicely illustrated by figure 4 giving details about each participant.

Figure 4 shows the difference in the choice of healthy foods for the other minus the choice for themselves by mothers on the left chart and by children on the right chart. For each chart, the number identifying participant is represented on the X-axis, while the difference in the choice for the other minus the choice for oneself is represented on the Y-axis. For a participant, a positive value corresponds to a paternalistic behavior while a negative value corresponds to an indulgent behavior. On each chart, the continuous curve is built up with differences in choices (related to bag #2 versus bag #1) before the revelation of the message ranked by increasing order. Note that the ranking of a given mother on the X-axis of the left chart does not necessarily correspond to a similar ranking for her child on the X-axis of the right chart, since differences in choices are respectively ordered for each chart.

On each chart, the dots represents the differences in choices (related to bag #4 versus bag #3) after the revelation of information for participants indicated on the X-axis but ordered on the basis of the previous continuous curve, namely the difference in choices before the revelation of information (see the description in the previous paragraph). This explains why dots are scattered on the chart since the variation in paternalism/indulgence coming from the message is a priori not related to the initial paternalism/indulgence. For a same participant on the X-axis, the impact of the information on the paternalism/indulgence is given by the vertical difference between the corresponding point of the curve and the isolated corresponding point. Two overlapping points for a same participant means that the paternalism/indulgence did not change after the revelation of information.

[Insert Figure 4]

As shown by the two plain curves on figure 4, *before the revelation of information, mothers were more indulgent* ó i.e., mothers made less healthy choices for their child than they made for themselves ó *than the children who tended to be relatively õpaternalisticö* ó i.e., they made healthier choices for their mother than for themselves. Before the nutritional message, the differences in choices by mothers and the differences in choices by children are significantly different (as shown in the left column table 4). Prior to the disclosure of information, on the plain curve on the left chart, 51.3% of mothers were found to be indulgent for their child by choosing a lower number of healthy foods for their children than for themselves. 29.7% were found to be "neutral" by choosing the same amount of healthy foods for their children and for themselves. On the contrary, on the plain curve of the right chart, 66.9% of children were found to be paternalistic, selecting a higher number of healthy foods for their mother than for themselves.

Explaining this tendency to paternalism by children is not easy since the definition combines the choices for the other person of the family and for themselves. The terms õpaternalistic/indulgentö applied to children are likely to reflect the perception of their mothers' preferences regarding products rather than the pure fact of taking decisions for others, which is the essence of the paternalism. This can also possibly account for a signaling effect ("looking good" in the eyes of the mother).

The communication of the nutritional message significantly influenced the choice made by mothers and children in favor of healthier foods, both for themselves and for others. In figure 4, the distribution of differences in choices of participants clearly shifts with many dots differing from the plain curve, in particular for children. The lines of table 4 reveal a significant impact of information on the paternalism/indulgence of children only. *The information has the strongest impact on the children's selection of foods for themselves compared to their selection for their mother, leading to more indulgence.* In particular, on figure 4, among the 75 children (66.9% of the total) initially "paternalistic", 26 of them became indulgent and 12 of them became neutral after the disclosure of information. As information led them to turn to healthier choices mainly for themselves, they tended to give less healthy choices for others than choices for themselves (south east part of the right chart of figure 4 under the plain curve). In contrast, among the 88 indulgent or neutral mothers (81% of the total), only 5 of them became paternalistic with differences in choices higher than zero. *The revelation of information tended to transform the indulgent mothers in less indulgent mothers, with their own choice becoming closer to the choice*

for their child: 32 mothers became neutral or less indulgent with the information, after being initially indulgent. However, these 32 mothers did not become paternalistic (south west part of the left chart above the plain curve). In the same time, a counterbalancing effect happens for mothers on the left chart, with 17 mothers becoming indulgent with the information, after initially being neutral and paternalistic (south east part of the left chart under the plain curve).

Some econometric estimations confirm the results of table 4 and figure 4 as shown in the Appendix for reviewers. These econometric estimations show that the *message clearly shifts children's behavior towards indulgence, which is not the case for the mothers for whom the message does not significantly impact their indulgence.*

[Insert Table 5]

Eventually, we tested for the link between the reaction to the nutritional message and the paternalism before the revelation of this information. Table 5 reveals a positive and significant relationship between the paternalism preceding the revelation of the nutritional message and the impact of this message. The paternalism elicited before the message is a significant predictor of the participants' reactions towards more healthy products for themselves after the revelation of the nutritional message. It means that the fact to give more healthy food to the other member of the family than the choice for her/himself make participants more sensitive to the message compared to indulgent participants. In a sense, the nutritional message confirms the "healthy preference for other", namely the healthy products that a participant allocates to the other member of the family, which particularly matters for the paternalistic participants. Note that the coefficients related to the paternalism for mothers and children are very close (0.251 and 0.249). With these similar coefficients in table 5, the higher reactions to the information by children, shown in figure 2, are positively and significantly explained by the fact that children are much more paternalistic than the mothers before the revelation of the information. The last column of table 5 also shows that the authorization of frequent snacks between meals by mothers negatively impacts the reception of the message and the shift in choices by the children with a coefficient equal to -0.411. This result confirms the importance of parents' involvement in the children's nutrition behavior. A "relatively bad behavior" reduces the possibility to change food choices via a nutritional message, and maybe requires alternative tools like a tax for changing behaviors (see Papoutsi et al., 2014).

To conclude with table 5, this important result linking the paternalism and the reaction to the information is only visible with a lab experiment, where the choices for oneself and for the other member of the family are clearly controlled by the lab protocol.

3. Conclusion

This paper suggests that a message about food nutrient content had a significant impact on children making independent choices, even if they were accompanied by their mothers. Children tend to be more paternalistic than their mother before the revelation of the message. As children strongly react to the nutritional message, children become more indulgent (namely, less paternalistic) than before the revelation of the message, even if they are still less indulgent than their mothers. Information reduces behavioral differences between mothers and children, even if some residual differences persist. Information reunified the family, since choices inside the family seem more harmonized after the revelation of information.

One important conclusion of this paper is that mothers' and children's choices for themselves and for the other member of the family matter for understanding foods choices of families. Nevertheless, as our paper is a one shot experiment organized in a lab in the presence of experimenters, there is no definitive conclusion.

Some extensions are possible for complementing this experiment. First, variations in the design of the protocol may be organized. Rather than choosing for their mothers, children could join the experiment with their father, their nanny, their best friend or an anonymous fellow randomly selected in the lab. Alternatively, a new subgroup of participants could be asked first to choose for the other member of their family before choosing for themselves. Moreover, alternative messages revealed to participants could also be tested.

Another type of extension would consist in getting more details about the meaning of the indulgence or the paternalism, since we do not know exactly the motivation underlying these behaviors. One extension would be to add a recall step after the cross choices and ask questions about motivation such as the satisfaction of the other person preferences, the need or the wish to appear as a good student/citizen regarding the healthy product in front of the other person of the family, the search for the absence of conflicts. Additionally, we could also ask participants if they were happy with their choices or if they wanted to change these choices as to check for stability and conviction.

A last type of extension would consist in changing some or all products that participants could select for filling up bags. We could also enlarge the choice of both healthy and unhealthy foods used in the experiment. More products to choose would enlarge the possible choices and trade-offs between pleasure and health, thus testing for the robustness of results.

All in all, this paper leads to important conclusions regarding behavior, and important challenges for policy-makers. In particular, we find children to be paternalistic and sensitive to nutritional messages, which brings interesting insights to socially support advertising campaigns dedicated to children

References

- Belot, M. and J. James 2011. Healthy school meals and educational outcomes. *Journal of Health Economics* 30(3): 489-504.
- Camerer, C., Issacharoff, S., Loewenstein, G., O'Donoghue, T., and M. Rabin (2003). Asymmetric paternalism. *University of Pennsylvania Law Review* 151: 1211-1254.
- Cipriani, M., Giuliano, P. and O. Jeanne (2013). Like mother like son? Experimental evidence on the transmission of values from parents to children. *Journal of Economic Behavior & Organization* 90: 1006-111.
- Contento, I. (1981). Children's thinking about food and eating - A Piagetian-based study. *Journal of Nutrition Education* 13(1. Suppl.): S 86-S 90.
- Contento, I. R., J. S. Randell, and D. Basch. (2002). Review and analysis of evaluation measures used in nutrition education intervention research. *Journal of Nutrition Education and Behavior* 34(1): 2-25.
- Cooke, L. J. and J. Wardle (2005). Age and gender differences in children's food preferences. *British Journal of Nutrition* 93(5): 741-746.
- Falk A. and J.J. Heckman. 2009. Lab experiments are a major source of knowledge in the social sciences. *Science* 326: 535-538.
- Fehr, E., H. Herz, and T. Wilkening. 2013. The lure of authority: motivation and incentive effects of power. *American Economic Review* 103(4): 1325-59.
- Gram, M. (2014). Buying food for the family: negotiations in parent/child supermarket shopping: an observational study from Denmark and the United States. *Journal of Contemporary Ethnography*, forthcoming.

Jacobsson, F., M. Johannesson and L. Borgquist. 2007. Is altruism paternalistic? *Economic Journal*, 117, 761-781.

Levitt S. and J.A. List. 2007. What do laboratory experiments measuring social preferences reveal about the real world. *Journal of Economic Perspectives* 21(2): 153-174.

List, J. A., and A. S. Samek, (2014). The behavioralist as nutritionist: leveraging behavioral economics to improve child food choice and consumption. NBER WP 20132. National Bureau of Economic Research, Washington D.C., USA.

Loewenstein, G., Brennan, T. and Volpp, K.G. (2007). Asymmetric paternalism to improve health behaviors. *Journal of the American Medical Association* 298:2415-2417.

Lusk J., S. Marette and B. Norwood (2014). The paternalist meets his match. *Applied Economic Perspectives & Policy* 36: 61-108.

Maimaran M. and A. Fishbach (2014). If it's useful and you know it, do you eat? Preschoolers refrain from instrumental food. *Journal of Consumer Research* 41: 642-655.

Monnery-Patris, S., N. Rigal, Chabanet, V. Boggio, Lange, Cassuto, S. Issanchou, (2011). Parental practices perceived by children using a French version of the kids' child feeding questionnaire. *Appetite* 57(1): 161-166.

O'Donoghue, T. and M. Rabin. 1999. Doing it now or later. *American Economic Review* 89: 103-124.

O'Donoghue, T. and M. Rabin. 2001. Choice and procrastination. *Quarterly Journal of Economics* 116: 121-160.

O'Donoghue, T. and M. Rabin. 2003. Studying optimal paternalism, illustrated by a model of sin taxes. *American Economic Review* 93 (2): 186-191.

Ogden, J., Reynolds, R., & Smith, A. (2006). Expanding the concept of parental control: A role for overt and covert control in children's snacking behaviour? *Appetite* 47: 100-106.

Papoutsis, S., Nayga, R. M., Lazaridis, P. Drichoutis, A. C. (2014). Nudging parental health behavior with and without children's pestering power: fat tax, subsidy or both? Working paper, available at <http://d.repec.org/n?u=RePEc:ags:eaee14:182864&r=exp>.

Ricoch L. (2012). *Regards sur la parité, Edition 2012*. Institut de la Statistique et des Etudes Economiques, Paris, France.

Rigal, N., Chabanet, C., Issanchou, S., & Monnery-Patris, S. (2012). Links between maternal feeding practices and children's eating difficulties. Validation of French tools. *Appetite* 58: 629-637.

Thaler, R.H. and C.R. Sunstein. 2003. Libertarian paternalism. *American Economic Review* 93:175-179.

Tibbs, T., Haire-Joshu, D., Schechtman, K. B., Brownson, R. C., Nanney, M. S., Houston, C., & Auslander, W. (2001). The relationship between parental modeling, eating patterns, and dietary intake among African-American parents. *Journal of the American Dietetic Association* 101: 535-541.

Vaughn, A., Tabak, R., Bryant, M., & Ward, D. (2013). Measuring parent food practices: a systematic review of existing measures and examination of instruments. *International Journal of Behavioral Nutrition and Physical Activity* 10: 61-92.

Wansink, B., S. Sonka and C. Hasler (2004). Front-label health claims: When less is more. *Food Policy* 29: 659-667.

Figure 1. Organization of the experiment



Picture 1: Room before the entry of participants



Picture 3: Mothers on the left and kids on the right

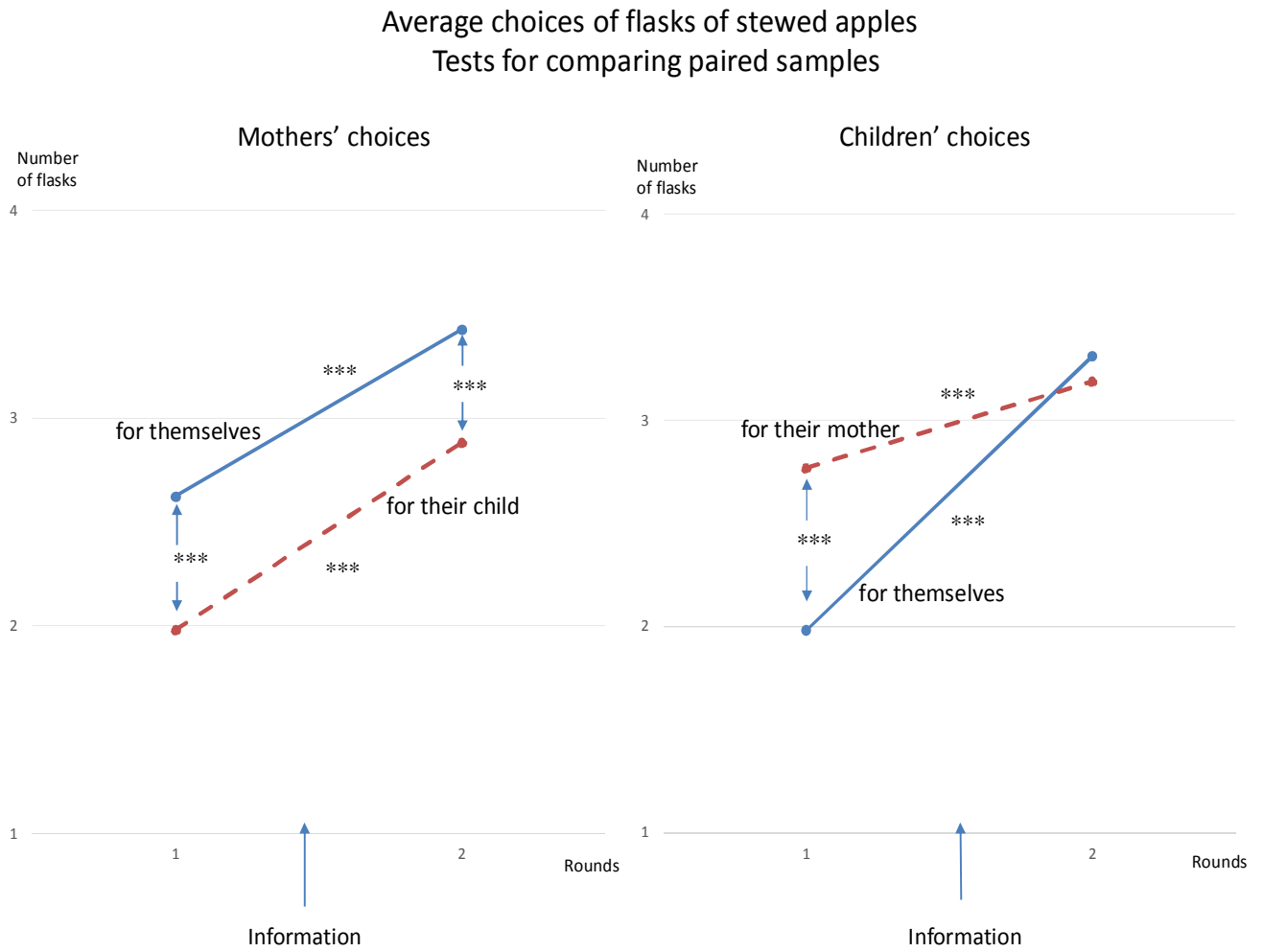


Picture 2: Table before the participants' entry



Picture 4: An example of 4 bags at the end of the session

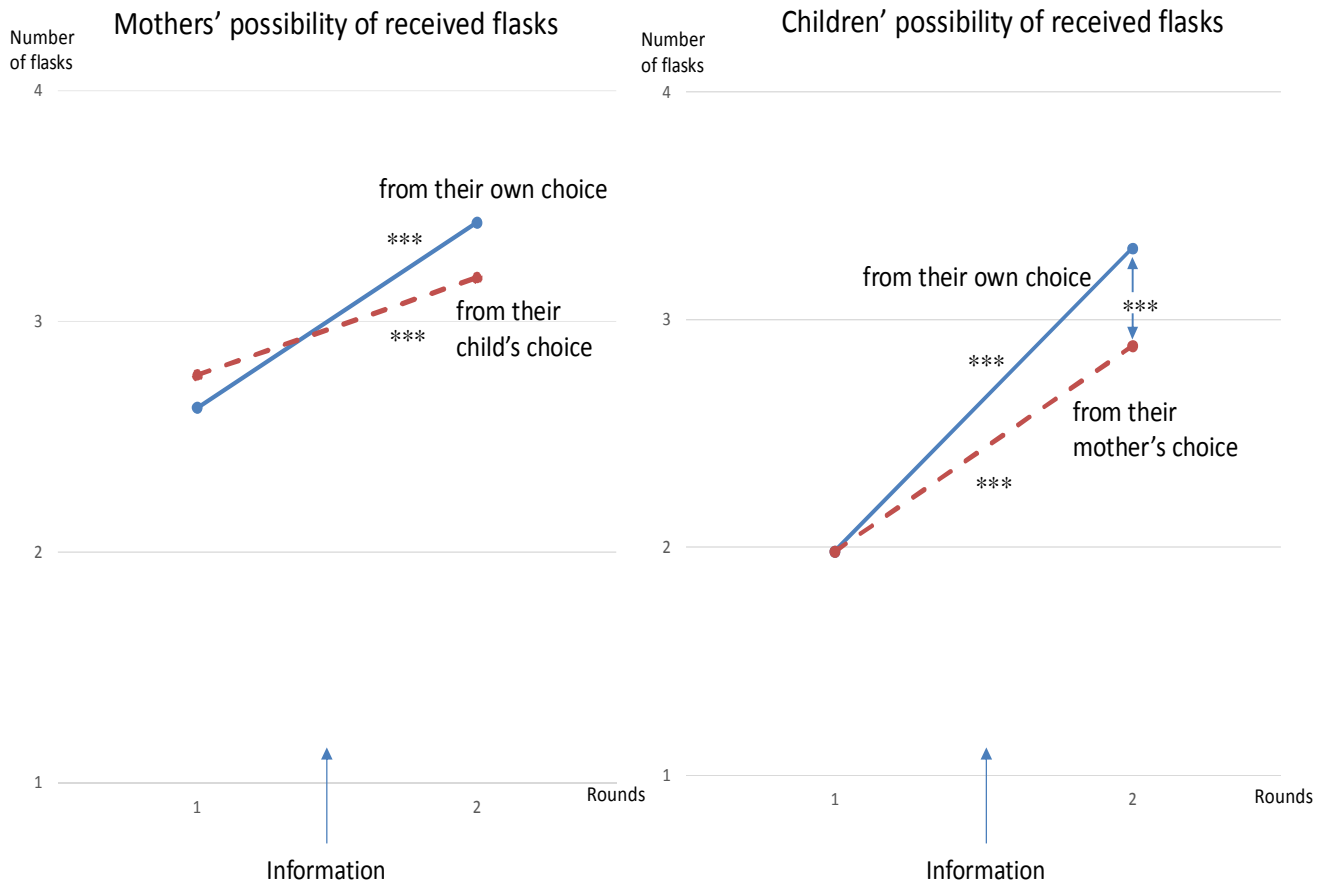
Figure 2. Choices for themselves and for the other member of their family



Note: *** denotes significant difference at 1% as tested by the Wilcoxon paired sample test

Figure 3. Choices that participants may receive

Average received flasks of stewed apples
 depending on choices made by the participant and the other member of the family
 Tests for comparing paired samples



Note: *** denotes significant difference at 1% as tested by the Wilcoxon test for comparing paired sample choices

Figure 4. Paternalistic and indulgent choices before and after information

Difference of choices of flasks of stewed apples:
 The choice for the other minus the choice for myself by each participant
 Curve: ordered differences of choices before the revelation of information
 Dots: differences of choice after the revelation of information for a same participant of the X-axis

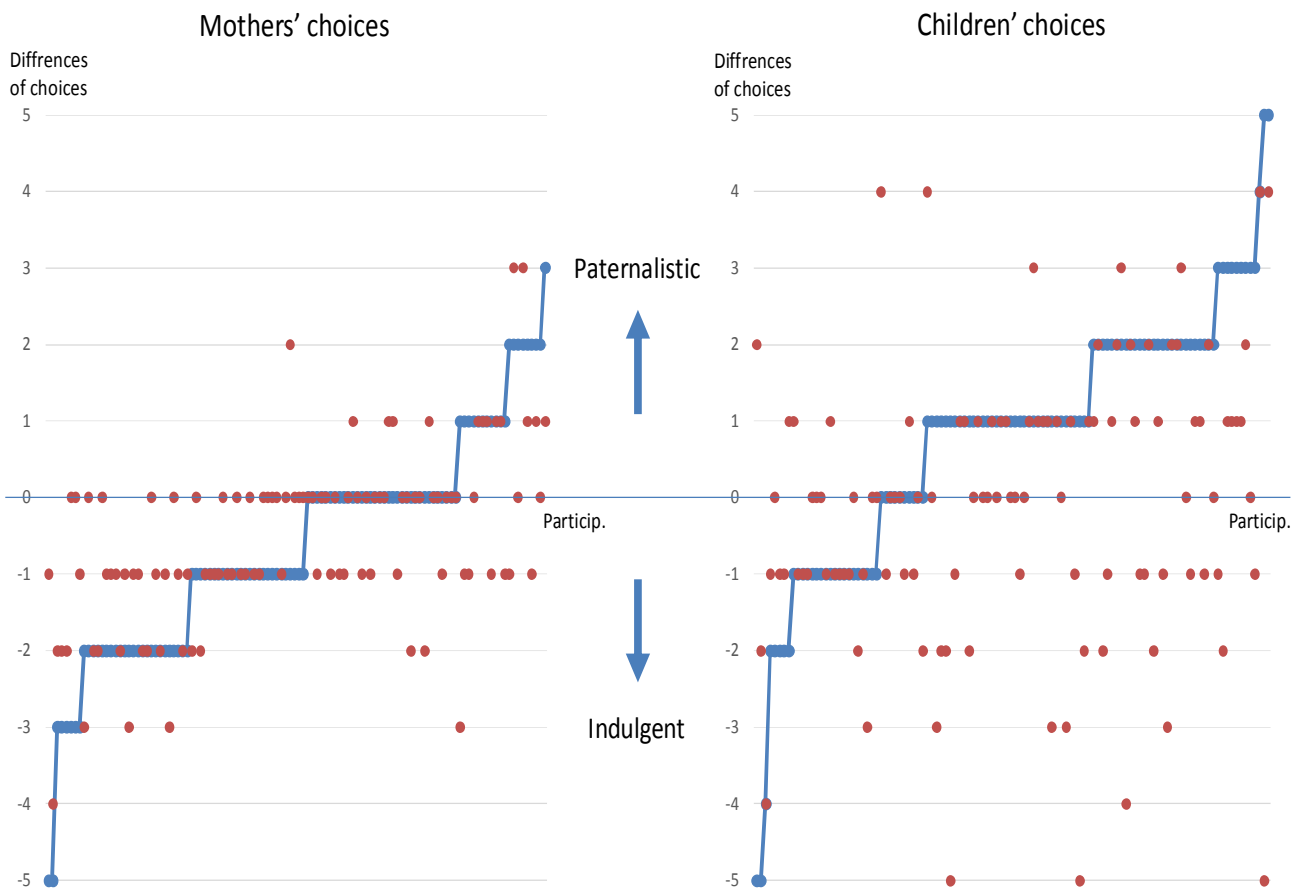


Table 1. Socio-economic characteristics of participants

| | |
|---|------|
| Children's Gender (%) | |
| Male | 49.1 |
| Female | 50.9 |
| Children Age (%) | |
| 8 years old | 0.9 |
| 9 years old | 28.6 |
| 10 years old | 36.6 |
| 11 years old | 32.1 |
| 12 years old | 1.8 |
| Mothers' Age (%) | |
| < 40 | 38.4 |
| [40-49] | 57.2 |
| ≥ 50 | 4.4 |
| Mothers' Education | |
| No baccalaureate (BAC) ^a | 9.8 |
| BAC or 2 years after BAC | 58.9 |
| More than 2 years after BAC | 31.3 |
| Monthly net income of the household (p) | |
| ≤ 3000 | 42.0 |
|]3000-5000[| 49.1 |
| × 5000 | 8.9 |
| Participants who have never eaten the food of the experiment | |
| Mothers, never eaten healthy food (%) | 2.7 |
| Mothers, never eaten unhealthy food (%) | 4.5 |
| Children, never eaten healthy food (%) | 0 |
| Children, never eaten unhealthy food (%) | 8.9 |
| Liking of food for participants who have already eaten the food. 1: don't like 7: like a lot. | |
| Average score | |
| Mothers for healthy food | 5.53 |
| Mothers for unhealthy food | 4.78 |
| Children for healthy food | 5.85 |
| Children for unhealthy food | 5.88 |

Notes: ^a Baccalaureate (BAC) is the French high school diploma.

Table 2. Ordered probit estimates of healthy foods selected by mothers for themselves

| Variable | Before Info (bag #1) | After Info (bag #3) | Combined ^a (bags #1 and #3) |
|---|-------------------------|------------------------|---|
| Mother's choice of healthy food for her child in round #1 (bag #2) | 0.275*** (0.090) | 0.059 (0.104) | |
| Mother's expectation of the choice made for her by her child, round #1 | 0.315*** (0.083) | 0.202** (0.089) | |
| Mother's choice of healthy food for her child in round #2 (bag #4) | | 0.370*** (0.141) | |
| Mother's expectation of the choice made for her by her child, round #2 | | 0.331*** (0.124) | |
| Mother's choice of healthy food for her child, round#1+2(bags#2#4) | | | 0.316*** (0.070) |
| Mother's expectation of the choice made for her by her child,round1+2 | | | 0.323*** (0.065) |
| Liking of unhealthy food (candy bar) ^{b,d} | -0.279*** (0.082) | -0.136** (0.068) | -0.218*** (0.046) |
| Liking of healthy food (stewed apples) ^{b,d} | 0.217*** (0.080) | 0.315*** (0.089) | 0.268*** (0.058) |
| Mother's age ^c | 0.048** (0.025) | 0.033 (0.026) | 0.038** (0.017) |
| Income ^c 1$\leq p$1000í to 7>math>p</math>6000 | 0.292*** (0.092) | 0.016 (0.091) | 0.146** (0.063) |
| Snack preferences: Easy to eat ^{c,e} | -0.200* (0.107) | 0.110 (0.108) | -0.054 (0.074) |
| Snack preferences: Absence of conflict ^{c,e} | -0.167* (0.092) | -0.179* (0.095) | -0.167*** (0.063) |
| Snack preferences: Rich in vitamins ^{c,e} | 0.279*** (0.023) | 0.163 (0.127) | 0.192** (0.085) |
| Information (Dummy=1 for round #2, 0 for round #1) | | | 0.441*** (0.168) |
| 1 | 1.838 (1.388) | 2.676* (1.406) | 1.965** (0.959) |
| 2 | 2.461** (1.390) | 3.170** (1.410) | 2.525*** (0.961) |
| 3 | 3.725*** (1.410) | 4.280*** (1.438) | 3.656*** (0.974) |
| 4 | 5.517*** (1.450) | 5.731*** (1.474) | 5.113*** (0.996) |
| 5 | 6.220*** (1.458) | 7.591*** (1.517) | 6.430*** (1.011) |
| CraggóUhlen Pseudo R ² | 0.620 | 0.599 | 0.603 |
| N. Obs. | 110 | 110 | 220 |

Note: ***, **, * = significant at 0.01, 0.05 and 0.10 levels, respectively. A positive coefficient implies that when the associated variable increases the choice of more healthy foods is more likely. Numbers in parentheses are standard errors. ^a Data before and after information are stacked and a random effects model was estimated to account for the panel nature of the data. ^b Question from the exit questionnaire. ^c Question specific to the mothers' exit questionnaire. ^d Liking of food for participants who already have eaten the food, 1: don't like 7: like a lot. For the few participants who had never eaten the food, we selected the intermediate value 3.5 that is supposed to be neutral on the scale between 1 and 7. ^e Reply to the following question: When I purchase a snack for my child I pay attention to the following characteristic, 1: completely false 5: completely true.

Table 3. Ordered probit estimates of healthy foods selected by children for themselves

| Variable | Before Info (bag #1) | After Info (bag #3) | Combined^a (bags #1 and #3) |
|--|---------------------------------|--------------------------------|--|
| Mother's choice of healthy food for her child in round #1 (bag #2) | 0.182** (0.090) | 0.141 (0.091) | |
| Child's expectation of the choice made for her/him by her mother in round #1 | 0.145* (0.083) | 0.022 (0.088) | |
| Child's expectation of the choice made for her/him by her mother in round #2 | | 0.214** (0.095) | |
| Mother's choice of healthy food for her child, round#1+2(bags#2#4) | | | 0.075 (0.066) |
| Child's expectation of the choice made for her/him by her mother in round #1 and #2 | | | 0.218*** (0.060) |
| Liking of unhealthy food (candy bar) ^b | -0.150*** (0.050) | -0.087* (0.051) | -0.119*** (0.035) |
| Liking of healthy food (stewed apples) ^b | 0.195** (0.079) | 0.251*** (0.080) | 0.235*** (0.056) |
| Information (Dummy=1 for round #2, 0 for round #1) | | | 0.936*** (0.165) |
| 1 | -0.263 (0.581) | -0.045 (0.642) | 0.204 (0.424) |
| 2 | 0.503 (0.579) | 0.508 (0.640) | 0.911** (0.424) |
| 3 | 1.516*** (0.587) | 1.031 (0.640) | 1.732*** (0.430) |
| 4 | 2.586*** (0.616) | 2.163*** (0.649) | 2.798*** (0.445) |
| 5 | 3.084*** (0.642) | 3.027*** (0.665) | 3.550*** (0.460) |
| CraggóUbler Pseudo R ² | 0.287 | 0.281 | 0.421 |
| N. Obs. | 112 | 112 | 224 |

Note: ***, **, * = significant at 0.01, 0.05 and 0.10 levels, respectively. A positive coefficient implies that when the associated variable increases the choice of more healthy foods is more likely. Numbers in parentheses are standard errors. ^a Data before and after information are stacked and a random effects model was estimated to account for the panel nature of the data. ^b Question from the exit questionnaire. Liking of food for participants who already have eaten the food, 1: don't like 7: like a lot. For the few participants who had never eaten the food, we selected the intermediate value 3.5 that is supposed to be neutral on the scale between 1 and 7.

Table 4. Difference between the choice for the other and for oneself (with paternalism when the difference > 0 and indulgence when the difference < 0)

| | Paternalism/indulgence Before Information bag #2 minus bag #1 Mean (st. dev.) | Paired Sample Comparison Information^a | Paternalism/indulgence After Information bag #4 minus bag #3 Mean (st. dev.) |
|--|--|---|---|
| Children | 0.785 (1.716) | Z= 4.255*** P < 0.001 | - 0.125 (1.826) |
| Paired Sample Comparis. Children/Mothers^b | Z= - 5.277*** P < 0.001 | | Z = - 1.680* P = 0.092 |
| Mothers | - 0.642 (1.444) | Z= - 1.200 P = 0.230 | - 0.544 (1.145) |

Note: Paired sample comparison by Wilcoxon (Mann-Whitney-U).

^a Paired sample comparison of the impact of information for a same group of participants.

^b Paired sample comparison between mothers and children of the same family for a given set of information.

H₀: frequencies for a group = frequencies for the other group. * denotes rejection of H₀ at 10%, significance level. ** denotes rejection of H₀ at 5% significance level. *** denotes rejection of H₀ at 1% significance level.

Table 5. Ordered probit estimates of reactions to the nutritional message by mothers and children when choosing snacks for themselves

| Variable | Mother's reaction (bag #3 - bag#1) | Children's reaction (bag #3 - bag#1) |
|--|---------------------------------------|---|
| Mother's paternalism before the revelation of information (bag #2 ó bag #1) | 0.251*** (0.079) | |
| Children's paternalism before the revelation of information (bag #2 ó bag #1) | | 0.249** (0.060) |
| Liking of healthy food by (stewed apples) ^{a,b} | 0.208*** (0.077) | |
| Income ^{a,c} 1<p1000í to 7>p6000 | -0.171** (0.087) | |
| Snack preferences: Easy to eat ^{a,c,e} | 0.318*** (0.101) | |
| Children's response on mother's practice: Frequent snacks ^d | | -0.411*** (0.141) |
| -1 | | -2.897*** (0.426) |
| 0 | -0.860 (0.023) | -2.235*** (0.337) |
| 1 | 1.232* (1.388) | -1.299*** (0.289) |
| 2 | 2.514*** (0.678) | 0.279 (0.270) |
| 3 | 3.424*** (0.715) | 0.520* (0.279) |
| 4 | 4.433*** (0.840) | 1.130*** (0.305) |
| 5 | | 1.865*** (0.389) |
| CraggóUhler Pseudo R ² | 0.292 | 0.212 |
| N. Obs. | 111 | 112 |

Note: ***, **, * = significant at 0.01, 0.05 and 0.10 levels, respectively. A positive coefficient implies that when the associated variable increases the choice of more healthy foods is more likely. Numbers in parentheses are standard errors. ^a Question specific to the mothers' exit questionnaire. ^b Liking of food for participants who already have eaten the food, 1: don't like 7: like a lot. For the few participants who had never eaten the food, we selected the intermediate value 3.5 that is supposed to be neutral on the scale between 1 and 7. ^c Reply to the following question: When I purchase a snack for my child I pay attention to the following characteristic, 1: completely false 5: completely true. ^d Reply to the following question: Did your mother allow you frequent snacks between meals, 1: never 4: always.

Appendix for Reviewers Only

Econometric estimation complements the understanding of Figure 4. In particular, tables A1 and A2 present ordered probit estimations of the choice for the other minus the choice for oneself before the revelation of information in column 1, after the revelation of information in column 2, and in a combined way pooling all observations in the third column.

[Insert Table A1]

Table A1 focuses on mothers' paternalism or indulgence with the comparison of the choice for the other minus the choice for themselves. Interestingly, the coefficients related to the liking of unhealthy and healthy foods suggest that some mothers seem to correct for their liking of foods when they fill up the bag for their children. In other words, mothers are paternalistic and give a higher number of healthy foods to their children compared to their own choice, as to correct for their liking of the unhealthy products (with a positive coefficient in all columns of table A1). Conversely, they are indulgent and give a lower number of healthy foods to their children compared to their own choice, as to correct for their liking of healthy foods (with a negative coefficient in all columns of table A1).

Eventually, in the third column of table A1, information has no significant effect on mothers' paternalism, because of the counterbalancing effects, already observed in the left chart of figure 4, with the 32 mothers becoming less indulgent or neutral after initially being indulgent, versus the 17 mothers becoming indulgent after initially being neutral and paternalistic.

[Insert Table A2]

Table A2 focuses on children's paternalism or indulgence with the comparison of the choice for the other minus the choice for themselves. Very few variables significantly explain children's behavior. In the third column of Table A2, the negative impact of information is clearly statistically significant. This negative impact of information with a coefficient equal to -0.476 confirms that many of initially neutral or paternalistic children become indulgent with the revelation of information, as previously shown in figure 4, with 26 of them becoming indulgent and 12 of them becoming neutral (south east part of the right chart of figure 4 under the plain curve). *Information clearly shifts children's behavior towards indulgence.* As shown in table 4,

information reduces behavioral differences between mothers and children, even if some residual differences persist with children who remain less indulgent than their mothers.

Table A1. Ordered probit estimates of paternalism by mothers. The dependent variable is the choice for the other minus the choice for oneself.

| Variable | Before Info bag #2 minus bag #1 | After Info bag #4 minus bag #3 | Combined ^a bags #2 minus #1 bags #4 minus #3 |
|---|---------------------------------------|--------------------------------------|---|
| Mother's expectation of the choice made for her by her child, round #1 | -0.143** (0.070) | -0.188** (0.080) | |
| Mother's expectation of the choice made for her by her child, round #2 | | -0.032 (0.105) | |
| Mother's expectation of the choice made for her by her child, round 1+2 | | | -0.138*** (0.055) |
| Liking of unhealthy food (candy bar) ^{b,d} | 0.239*** (0.063) | 0.096 (0.063) | 0.181*** (0.044) |
| Liking of healthy food (stewed apples) ^{b,d} | -0.138** (0.070) | -0.144* (0.074) | -0.139*** (0.050) |
| Frequency of purchase of healthy food (stewed apples) ^{c,e} | 0.290*** (0.096) | 0.020 (0.095) | 0.153** (0.067) |
| Frequency of purchase of unhealthy food (candy bar) ^{c,e} | -0.250** (0.120) | -0.044 (0.120) | -0.101 (0.083) |
| Income ^c 1 ≤ 1000 to 7 >math>\geq 6000</math> | -0.186** (0.081) | 0.003 (0.081) | -0.084 (0.056) |
| Information (Dummy=1 for round #2, 0 for round #1) | | | 0.213 (0.148) |
| -4 | | | -2.824*** (0.549) |
| -3 | -2.674*** (0.750) | -3.346*** (0.807) | -2.652*** (0.531) |
| -2 | -1.941*** (0.712) | -2.630*** (0.744) | -1.943*** (0.498) |
| -1 | -0.851 (0.690) | -1.843** (0.736) | -1.039** (0.490) |
| 0 | -0.152 (0.684) | -0.796 (0.731) | -0.205 (0.487) |
| 1 | 0.843 (0.690) | 0.451 (0.726) | 0.878* (0.489) |
| 2 | 1.462** (0.706) | 1.440** (0.734) | 1.591*** (0.498) |
| 3 | 2.758*** (0.819) | 1.655** (0.748) | 2.346*** (0.538) |
| CraggóUhler Pseudo R ² | 0.280 | 0.190 | 0.183 |
| N. Obs. | 112 | 112 | 224 |

Note: ***, **, * = significant at 0.01, 0.05 and 0.10 levels, respectively. A positive coefficient implies that when the associated variable increases the paternalism is more likely. Numbers in parentheses are standard errors. ^a Data before and after information are stacked and a random effects model was estimated to account for the panel nature of the data. ^b Question from the exit questionnaire. ^c Question specific to the mothers' exit questionnaire. ^d Liking of food for participants who already have eaten the food, 1: don't like 7: like a lot. For the few participants who had never eaten the food, we selected the intermediate value 3.5 that is supposed to be neutral on the scale between 1 and 7. ^e Frequency of purchase of food offered in the experiment, never=1 5: very often=5.

Table A2. Ordered probit estimates of paternalism by children. The dependent variable is the choice for the other minus the choice for oneself.

| Variable | Before Info bag #2 minus bag #1 | After Info bag #4 minus bag #3 | Combined ^a bags #2 minus #1 bags #4 minus #3 |
|--|---------------------------------------|--------------------------------------|---|
| Child's expectation of the choice made for her/him by her mother in round #1 | -0.136** (0.069) | -0.092 (0.075) | |
| Child's expectation of the choice made for her/him by her mother in round #2 | | 0.125 (0.087) | |
| Child's expectation of the choice made for her/him by her mother in round #1 and #2 | | | -0.037 (0.055) |
| Liking of healthy food (stewed apples) ^b | | -0.196*** (0.076) | -0.158*** (0.053) |
| Information (Dummy=1 for round #2, 0 for round #1) | | | -0.476*** (0.151) |
| -4 | -2.438*** (0.339) | -2.962*** (0.538) | -3.374*** (0.389) |
| -3 | | -2.721*** (0.522) | -3.168*** (0.377) |
| -2 | -2.262*** (0.304) | -2.346*** (0.509) | -2.932*** (0.367) |
| -1 | -1.776*** (0.240) | -1.905*** (0.503) | -2.492*** (0.356) |
| 0 | -0.996*** (0.198) | -1.187** (0.492) | -1.746*** (0.341) |
| 1 | -0.728*** (0.002) | -0.643 (0.486) | -1.329*** (0.335) |
| 2 | 0.110 (0.187) | 0.167 (0.483) | -0.507 (0.330) |
| 3 | 0.976*** (0.208) | 0.646 (0.490) | 0.240 (0.336) |
| 4 | 1.688*** (0.279) | 0.921* (0.499) | 0.825* (0.359) |
| 5 | 1.862*** (0.314) | | |
| Cragg-Uhler Pseudo R ² | 0.035 | 0.075 | 0.103 |
| N. Obs. | 112 | 112 | 222 |

Note: ***, **, * = significant at 0.01, 0.05 and 0.10 levels, respectively. A positive coefficient implies that when the associated variable increases the paternalism is more likely. Numbers in parentheses are standard errors. ^a Data before and after information are stacked and a random effects model was estimated to account for the panel nature of the data. ^b Question from the exit questionnaire. Liking of food for participants who already have eaten the food, 1: don't like - 7: like a lot. For the few participants who had never eaten the food, we selected the intermediate value 3.5 that is supposed to be neutral on the scale between 1 and 7.