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Effects of In-School Marketing Actions on Consumption Behavior

Efeito das Ações de Marketing na Escola sobre o Comportamento de Consumo

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ABSTRACT
Our study aims to analyze the effect of marketing actions in schools, driven by health-food companies, on the consumption behavior of students to understand whether they (a) show higher preference for healthy food and drinks; (b) choose to take such goods home; are aware that consuming these goods is a healthy habit; and (c) realize that sales of the companies that produce such health foods and drinks improve. We wish to contribute to the literature by using an experimental exercise in three schools in Porto district, Portugal. Our sample included 307 students aged from 6 to 16 years old, with 153(154) students belonging to the experimental (control) group. The regression results confirm our hypotheses. In particular, we found that the level of education of parents did not seem to have an impact, the results across male and female students are very close and that students' age did not affect the results between groups, but did affect score values.
Keywords: Health-food firms; in-school marketing actions; children and adolescents; consumption behavior; business performance.

JEL Classification: I12; L66; L83; M3; Z21

RESUMO
Este estudo tem como objetivo analisar o efeito das ações de marketing nas escolas, conduzidas por empresas de alimentos saudáveis, sobre o comportamento de consumo dos estudantes. O objetivo é entender se essas ações levam os estudantes a preferir alimentos e bebidas saudáveis, se passam a aconselhar esses alimentos e bebidas em casa, se estão cientes de que o consumo desses bens melhora a saúde, e se têm a perceção de que as empresas de alimentos e bebidas saudáveis melhoram as vendas com essas ações. Para o efeito conduziu-se um exercício experimental em três escolas do distrito do Porto, Portugal. A amostra incluiu 307 estudantes dos 6 aos 16 anos. Os estudantes pertencentes ao grupo experimental (controle) foram 153 (154) e foi usado um questionário para obter os dados quantitativos necessários. Os resultados, obtidos por meio de técnicas estatísticas e econométricas, confirmam as hipóteses. Os resultados são independentes da escola, do nível de educação dos pais, do sexo e da idade dos estudantes.
Palavras-chave: Empresas de alimentos saudáveis; ações de marketing na escola; crianças e adolescentes; comportamento de consumo; desempenho empresarial.

1. Introduction

Nowadays, obesity in childhood and youth has come to be considered a serious public health problem, which affects the future health of the population and, thus, health costs and productivity (WHO 2003, 2016; Wang and Lobstein, 2006). The consumption of healthy (i.e., nutritious) goods and drinks[1] during childhood and youth are crucial for current health (Story et al., 2002), and long-run health (Taliaferro, 2010; Swayne and Dodds, 2011). There are several factors that affect the behavior and, thus, the food choices of children and young students (hereinafter students). One of these factors is undoubtedly the marketing activity (Story et al., 2002; Hastings et al., 2006; Nestle, 2006).

Since schools have a powerful effect on how students eat (Kubik, 2003; Taliaferro, 2010; Swayne and Dodds, 2011), this study intends to contribute to the literature on nutrition and health, marking activity and eating behaviors, marketing and youth consumers, and the power of in-SMA (e.g., Levine, 1999; Valkenburg, 2000; Gentile and Walsh, 2002; Story et al., 2002; Coon and Tucker, 2002; Hastings et al., 2006; Larson et al., 2008; Swayne and Dodds, 2011; Mintz and Currim, 2013; Roberts et al., 2013) by analyzing if, indeed, in-school marketing actions (hereinafter in-SMA), driven by health-food firms, contribute to reducing the risk of chronic disease.

In-SMA are usually understood as a case in which schools authorize, usually via a contract, firms to carry out marketing activities in-school, namely advertising. A school can then allow only a particular brand to be sold on the school and, as a result, the firm would provide some compensation to the school. To reduce the possible negative impact of marketing programs on unhealthy food, firms should contribute to an advance in healthy eating habits, which does not seem to be happening.

Our aim is to verify if the effectiveness of these in-SMA affect the behavior of the students, increasing the consumption of the respective goods/services and, by this way, if they contribute to fighting obesity in childhood and youth. The growing epidemic of childhood (and youth) overweight and obesity can compromise the future health of the population, penalize the productivity, and create relevant health care costs (WHO, 2016). Thus, nutrition during childhood and youth is crucial for current and long-run health and productivity (Swayne and Dodds, 2011; Chadwick and Burton, 2011).

Looking at the food industry, several factors affect the food choices of students and one of these factors, with significant relevance, is food marketing (Coon and Tucker, 2002; Story et al., 2002; Hastings et al., 2006; Larson et al., 2008). Thus, students have been the target of multiple food marketing actions. Marketers have been using a wide variety of channels since they are interested directly in these consumers from their expenditures and indirectly since they affect the consumption of their family and are future adult consumers (Valkenburg, 2000).

The use of schools as spaces closed and controlled for in-SMA has grown with the desire to raise sales and ensure students' loyalty as consumers. The in-SMA happen since firms take advantage of the financial fragility of schools (the lack of resources) to obtain permission

[1] Healthy goods and drinks are those that include a variety of relevant elements to improve health status or reduce the risk (non-prevention) of the disease. The functional ingredients are useful for the treatment of obesity and associated comorbidities, surpassing even the benefits of medication (Baboota et al., 2013).

for their realization (Levine, 1999). Yet, due to the epidemic of childhood overweight and obesity, the food sector is increasingly regulated, but in-SMA aimed at health-food firms will always be permitted and still encouraged, regardless of the restrictions imposed by the law.

As the in-SMA towards health-food goods and drinks firms are permitted and encouraged, it is expected that they positively affect the attitudes and, thus, the willingness to consume them. We consider that it makes sense to answer the questions: I have preference for nutritious/healthy food products (food and drink)? I believe that health relies on the consumption of nutritious/healthy food? I advise my parents to buy nutritious/healthy food products? Healthy food brands sell better quality products? Healthy food brands are more reputable and therefore more advisable? Healthy product brands sell more? Moreover, using statistic and econometric techniques, we also intend to observe if the in-SMA has indeed a strong explanatory power in the results and if sociodemographic data is important.

With children and adolescent obesity very much in focus, marketing activity on the need for a new healthier physical reality make sense. This activity can be characterized as a management task, which includes many tasks, such as doing market research, identifying the needs in the market, analyzing the market trends, planning the conception of goods and services, branding, price, promotions, and distributions to meet consumer demand (Wilkie and Moore, 2007). It is a set of entrepreneurial actions that are part of the management process that connects a business with its consumers and can be designed in some ways (Finkelstein and Peteraf, 2007).

The effectiveness of marketing in terms of revenue and profitability, for example, is a topic that brings together the interests of professionals and researchers from the business management field (Mintz and Currim, 2013; Roberts et al., 2013). Because we do not know – to the best of our knowledge – the effect of in-SMA carried out by health-food goods and drinks firms on students' consumption behaviors and then on productivity, sales and profits of the firms, and on health and productivity in general within the economy, we also contribute to close this gap in the literature. Indeed, while not responding directly to these questions, we will get a partial answer by noticing the attitude change in the involved students and bearing in mind that an in-SMA is a small task in the enormous task that is the marketing activity.

In short, we intend to contribute to the literature by precisely considering the effect of in-SMA on student's (health-food) consumption behaviors. By increasing the consumption of health food in a hasty manner, in-SMA can contribute to improving sales of the respective firms and, although there are costs involved, we anticipate that they can also contribute to increase profits (Mintz and Currim, 2013; Roberts et al., 2013; Porto et al., 2017). Moreover, healthier eating habits will contribute to improve the health of the general population, thereby lowering the costs of health expenditure and increasing productivity, which, in turn, positively affects economic growth (Kuhn and Prettner, 2016). As Naylor et al. (2009) observe, health is one of the main variables in the study of consumer behavior towards health-food: consumers present a more positive attitude and increase the intention to buy goods when they are presented as healthy and have favorable nutritional information.

Due to the operational limitations involving how to measure the effect of marketing actions and how to relate them to business performance indicators, researchers have made few advances in the scientific knowledge that could improve the effectiveness of marketing

management (Porto et al., 2017). Part of what is researched regarding this subject is related to the marketing costs, especially advertising, described in accounting information such as the firm's income statement and balance sheet (Raman et al., 2012). This line of research seems to be rewarding, leading to general conclusions on the effect of marketing costs without identifying the specific cost responsible for differences in rates of returns. These studies tend not to indicate the impact of the execution of an individual marketing action itself, but rather to emphasize the connected costs (Ward, 2013). Thus, the true sources of the firm's good and service sales, those that directly affect consumers, tend to remain unknown.

The reason for the lack of studies directly investigating marketing actions and their financial performance involves the differences between what is recorded and focused on firm customer management and what is recorded for accounting and financial purposes (Ward, 2013). Marketing activities are almost exclusively intended for managers to decide on sale and accounting costs (McDonald et al., 2014). As stated by Porto et al. (2017), the effects of implementing marketing activities to raise firm sales and increase profitability for the owners of or partners in micro-businesses remains open for scientific research. When trying to evaluate the effectiveness of in-SMA on student's (health-food) consumption behaviors, through an experimental exercise, the expected impact in sales and revenues is also perceived.

To answer the research questions, that resulted from the objective of the study, the desired contribution to the literature and the characteristics of the respondents, an experiment was carried out in three schools of the Porto district – two of the Matosinhos county and one of the Maia.

Experiments have two groups of subjects (e.g., Bailey, 2008). One group is the experimental group (half of the classes per school), which, in our case, was exposed to an in-SMA, whereas the other group is the control group (the other half classes), which was not exposed to an in-SMA. Our sample included 307 students aged from 6 to 16 years old: (i) 129 students from school 1, (ii) 57 students from school 2, and (iii) 154 from school 3. Students belonging to the experimental (control) group were 153 (154). Then, to collect data, we used a questionnaire (see Section 3.5), properly explained according to the age of the students, by applying six closed-end questions to test the hypotheses that underlie our investigation, bearing in mind the Likert-type scale of five levels (Likert, 1932).

The results allow us to emphasize some main conclusions due to the in-SMA. First, the experimental group obtained higher median scores for all the proposed questions, with significant results, confirming our hypotheses. Hence, in-SMA has affected student consumption behavior. Second, the different schools did not establish any noticeable difference in the results, with higher median scores for all the proposed questions on the experimental group. Third, results were very close between male and female students. Fourth, parent's level of education and the students' age did not seem to influence the results.

2. Hypotheses

From the literature, six hypotheses emerge to be tested. For example, in line with Ajzen (1991), the attitude towards a behavior is the degree of acceptance or rejection of the behavior; i.e., a positive (negative) attitude encourages (discourages) the purpose to execute

that behavior. Thus, as occurs for example in Urala and Lähteenmäki (2003), the attitudes are affected by biological, psychological, socio-cultural, and economic factors, which, in our view, can be influenced by in-SMA. In turn, attitudes (and beliefs) determine how information is processed, adapted and used, and consequently the behavior in the choice of foods and drinks. Hence, as emphasized by the literature (Story et al., 2002; Hastings et al., 2006; Larson et al., 2008), one powerful influencer force of students' food choices is clearly advertising and, in particular, in-SMA:

H1: *Children/students exposed to in-SMA towards nutritious food and drinks show a higher preference for nutritious food and drinks*.

Since the beginning of the 1990s, there has been growing interest in the study of attitudes and beliefs related to healthy eating; i.e., that increase the likelihood of consuming healthy food (Taliaferro, 2010; Swayne and Dodds, 2011). Some authors highlight how health knowledge, which can be transmitted through in-SMA, can have an effect on the attitude that increases the likelihood of healthy food selection (Naylor et al., 2009). Indeed, in-SMA can raise the students' awareness about how and why to eat suitably, as eating and nutrition are basic requisites to promote good health conditions (Story et al., 2009). Hence, health actions through in-SMA focused on students should be a priority for all social sectors, particularly in the school context. The school environment is the adequate space for dietary education activities focused on students since it affects students to achieve autonomy, construct personal values, beliefs, concepts and ways to know the world. Thus, the following hypothesis emerges:

H2: *Children/students exposed to in-SMA towards nutritious food and drinks are aware that consuming these goods tends to be healthier.*

The literature also evidences that the family played a fundamental role in the control of the choices, purchase, and preparation of the students' foods. However, the in-SMA are expected to lead students to influence family purchases of healthy foods since factors like lack of time and excessive dedication to work are aspects that interfere in the family's participation in the process of encouraging healthy eating (WHO, 2016; Story et al., 2002; Boutelle et al., 2006; Wang and Lobstein, 2006; Pearson and Biddle, 2011). As stated before, marketers are thus interested in students as consumers, either directly from their consumption expenditures or indirectly since they affect the consumption of their family and they are future adult consumers (Valkenburg, 2000), and the hypothesis 3 emerges:

H3: *Children/students exposed to in-SMA towards nutritious food and drinks tend to choose to bring these goods home thus affecting family habits*.

Mitchell and Olson (1981, p. 318) define attitude toward the brand as an "individual's internal evaluation of the brand." Spears and Singh (2004, p. 55) define attitude towards the brand as "a relatively enduring, unidimensional summary evaluation of the brand that presumably energizes behaviour." Empirical evidence supports the existence of a strong relationship between attitude towards the brand and purchase intention, stressing the relevance of this attribute in the consumer's preference for a brand (Haley and Case, 1979). Also significant empirical research indicates that attitude towards the brand is vital to affect brand loyalty (Oliver, 1999). Indeed, consumers tend to avoid risks by preferring familiar

brands (Oliver, 1999). Thus, by stressing some brands in carried out in-SMA it is expected that students show superior levels of attitude towards the explicit brands, as suggested by H4:

H4: *Children/students exposed to in-SMA towards brands of nutritious food or drinks show superior levels of attitude towards these brands.*

Brand reputation means how some brand is viewed and perceived by the consumers, stakeholders, and the market as a whole (Brunk, 2010). The brand reputation is the most valuable intangible asset for the organization (Peloza, 2005; Roberts and Dowling, 2002) and its importance is the result of its value as a differentiating attribute and vital tool for creating competitive advantage (Keller, 2008). Empirical evidence supports the belief that reputation is vital in consumer choice and thus in brand performance materialized in sales (Levine, 1999; Gentile and Walsh, 2002; Roberts and Dowling, 2002; Ataman et al., 2010; Jandaghi et al., 2011) and on revenue, profitability, and value in the financial market (Mizik, 2014; Siddhanta and Banerjee, 2014; Feng et al., 2015). Moreover, we expect that in-SMA help to improve brand reputation and we consider two new hypotheses:

H5: *Children/students exposed to in-SMA towards brands of nutritious food or drinks show superior levels of perceived brand reputation.*

H6: *Children/students exposed to in-SMA towards nutritious food and drinks have the perception that nutritious food and drinks firms want to improve sales.*

Finally, to answer all research questions we also intend to confirm, using econometric techniques, if the response given by the students following the in-SMA has indeed a strong explanatory power in the results, and if socio-demographic data is relevant. In this way, we try to verify if the results obtained vary according to the: group (experimental versus control); age; sex/gender; parents' educational level; the students' school.

3. **Methodology**

The adopted research methodology is now exposed. Since interpretation of results from numerous qualitative data is complex and is time consuming (e.g., Saunders et al., 2009), and there are many students, the quantitative method is more suitable to reach conclusions about the effect of in-SMA driven by health-food firms. We resorted to using a questionnaire, detailed below and presented in the Appendix A, to collect quantitative data by applying closed-end questions to test the hypotheses. Through this way we can correct any misunderstanding of some questions that are being asked, and any missing information that has not been filled in (e.g., Zikmund et al., 2010). We performed an experiment and thus data from an experimental group is compared with data from a control group. Only the former group was subject to an in-SMA. The purpose of having a control group is to rule out other factors that may affect the results of an experiment.[2]

[2] Through this procedure, we isolate the in-SMA's effects on the experiment and can help rule out other reasons of the experimental results (e.g., Bailey, 2008).

Secondary data was also collected, from the existing literature, which contributed to identify problems and formulate hypotheses, and in designing the survey questions.

3.1. The experimental design

We now use the experimental method that analyses the causal relationship between two variables, considering two homogeneous groups – the experimental group in which the explanatory or independent in-SMA variable is introduced, and the control group in which it is not introduced the independent variable –, and then comparing the two groups is possible to conclude if the independent variable is indeed explanatory (e.g., Bailey, 2008). Students were randomly divided into two groups – see Table 1 below: the experimental group (half of the classes per school); the control group (the other half classes).

Procedure. All students responded to the same questionnaire, but those belonging to the experimental group were subject to intervention before its application (i.e., to an in-SMA, which was conducted one week before). Indeed, following Podsakoff et al. (2003), to reduce the bias of the proposed methodology related to short-run memory, it was necessary to wait a period of time – and we have considered one week – between the in-SMA and the data collection phase with an objective instrument, the proposed questionnaire. To reach this stage, it was first necessary to obtain authorization from the authorities so that schools could be involved in the investigation, which led to the request for authorization form for schools, and then the consent of the parents. In this intervention were emphasized the benefits of healthy eating, were addressed some brands of healthy products, and students were asked for maximum involvement in the in-SMA. The experimental session was composed of some activities to: (i) make known the meaning and advantages of a healthy education at every meal and every day based on some specific contents and on available videos in the Youtube, suggesting that students repeat a version of the experimental activity at home with their parents; (ii) make known some healthy food brands and the videos viewed; (iii) indicate the expected trend of increased consumption of healthy food by firms that produce and / or market them, given the benefits associated with these products and taking into account actions such as the one carried out in class.

Intervention. The experimental session, authorized by the schools, was realized at the end of one normal school class and was lectured by the authors. At the beginning of class, the teacher informed the students that at the end of the class there would be an education session about healthy life, habits, and food. The teacher explained to the students that the experimental session intended to contribute to helping them to have better-eating standards, making known or emphasizing healthy food brands, and to make them as messengers of good eating practices. The experimental session was then based on the transmission of the some of the contents, as well as on the presentation of two videos on the benefits of health education. We selected videos from Youtube, which had to meet the following three criteria: the contents of the videos were as appropriate as possible to the action; the videos were as appropriate as possible to the ages and thus they are different between types of schools – the

two schools of the first cycle, schools 1 and 2, and the school of the second and third cycles, school 3; they had a duration not exceeding 10 minutes to capture the students' full attention.[3]

The procedure in data collection serves the purpose of meeting our aims; i.e., of testing the hypotheses. Thus, by subjecting only the experimental group to some precise information allows us to test specific hypothesis. Hypotheses H1, H2, and H3 are related to the impact of in-SMA on students, H4-H5 stress the effect of in-SMA on brands and so indirectly on the respective firms, and H6 highlight the direct effect of in-SMA on firms. To test if the differences in responses are motivated by the group to which the student belongs, the age, the sex and/or the parental education, we also use econometric techniques – a logit model – and the specifications:

$$Answer_i = \beta_1 Gr_i + \beta_2 A_i + \beta_3 Sex_i + \beta_4 FEL_i + \beta_5 MEL_i + \beta_6 Sc1_i + \beta_7 Sc2_i + \beta_8 Sc3_i + \varepsilon_i, \quad (1)$$

$$Answer_i = \alpha_1 Gr_i + \alpha_2 A_i + \alpha_3 Sex_i + \alpha_4 FEL_i + \alpha_5 MEL_i + \alpha_6 (Sc1_i \& Sc3_i) + \alpha_7 Sc2_i + \vartheta_i, \quad (2)$$

$$Answer_i = \delta_1 Gr_i + \delta_2 A_i + \delta_3 Sex_i + \delta_4 FEL_i + \delta_5 MEL_i + \delta_6 (Sc1_i \& Sc2_i) + \delta_7 Sc3_i + \varphi_i, \quad (3)$$

where: (i) $Answer_i$ is the dependent (or explained) variable that assumes the value 0 if the answer of the student i in the questionnaire is "Totally disagree", "Partly disagree" or "Neither agree nor disagree" and the value 1 if the answer of the student i is "Partly agree" or "Totally agree"; (ii) the explanatory or independent variable Gr_i assumes the value 0 if the student i belongs to the control group and the value 1 if she/he belongs to the experimental group; (iii) A_i corresponds to the age of the student i; (iv) Sex_i assumes the value 1 if the student i is male and 0 if the student is female; (v) FEL_i measures the father education level of student i, which can be 1st cycle (1), 2nd cycle (2), 3rd cycle (3), secondary (4), or superior (5); (vi) MEL_i measures the mother education level of student i, which can be 1st cycle (1), 2nd cycle (2), 3rd cycle (3), secondary (4), or superior (5);[4] (vii) Scj assumes the value 1 if the student i belongs to the school j=1, 2, 3 and the value 0 if not; thus, in (1) we consider each school separately, in (2) we consider the public schools ($Sc1$ and $Sc3$) on the one hand and the private school ($Sc2$) on the other,[5] and in 3 we consider primary or first cycle schools with children mostly from the 3rd stage ($Sc1$ and $Sc2$) on the one hand and post-primary (second and third cycles) school with adolescents mostly from the 4th stage ($Sc3$) on the other;[6] (viii) ε_i, ϑ_i and φ_i are the usual unexplained error term; (ix) β_i (i = 1, … , 8), α_i (i = 1, …, 7), δ_i (i = 1, … , 7) are the coefficient for which an estimate will be obtained.

[3] Thus, from the many existing and free available videos into the Youtube, the videos in the links https://www.youtube.com/watch?v=mbfwYTBtlmQ (duration 3m34s) and https://www.youtube.com/watch?v=bd4-g76Fni4 (duration 3m34s) were chosen for all experimental groups, the video in the link https://www.youtube.com/watch?v=NZgK8e1zzHQ (duration 5m13s) for students of the primary schools (i.e., of the first cycle), and the video of the link https://www.youtube.com/watch?v=AvW1sk93Qc4 (duration 6m35s) for students of the second and third cycles. These videos were also evaluated by the teachers of the classes of the respondents. All students were advised to show the videos at home for the whole family.

[4] As variables FEL and MEL are correlated, only one should be included in the estimates.

[5] ($Sc1$&$Sc3$) assumes the value 1 if the student i belongs to the schools 1 or 3 and the value 0 if not.

[6] ($Sc1$&$Sc2$) assumes the value 1 if the student i belongs to the schools 1 or 2 and the value 0 if not.

The probability that student i chooses alternative 1 is given by $Prob\ [Answer_i = 1|X] = \frac{e^{x'i\beta}}{1+e^{x'i\beta}}$, which is the reduced form of the logit model and X' is the row vector of explanatory variables.

3.2. The sample

To test our hypotheses (H1-H6), we have used a questionnaire from three urban schools, whose names are omitted for reasons of confidentiality, in the Porto district, north Portugal:

- two schools, school 1 and school 2, are located in the Matosinhos county. In these schools are taught the first cycle of studies (primary schools).[7] School 1 is a public school frequented by students belonging to the middle and middle-low social classes, while school 2 is a private one in which students belongs to the upper and middle-upper social classes;
- school 3 is located in the Maia county,[8] is public, teaches for the second and third cycles of studies and is frequented by students belonging to low and middle-low social classes.

Bearing in mind the Piaget's theory of cognitive development (Piaget and Inhelder, 1972), which considers that children move through four mental stages – i.e., 1st sensorimotor stage, birth to 2 years old; 2nd preoperational stage: ages 2 to 7 years old; 3rd concrete operational stage: ages 8 to 11 years old; 4th formal operational stage: ages 12 and up years old – depending on understanding how children obtain knowledge and on understanding the nature of intelligence, are considered, in a separated way:[9]

- children mostly from the 3rd stage – those in-schools 1 and 2 (7-10/11 years old);
- adolescents mostly from the 4th stage – those in-school 3 (>10/11 years old).

[7] The Portuguese Educational System is organized at various levels. The basic education is from 6 to 15/16 years old and is organized in three cycles. The 1st cycle includes four years (1º, 2º, 3º and 4º years and usually denominated primary), the 2nd cycle includes two years (5º and 6º years) and the 3rd includes three years (7º, 8º and 9º years). Secondary education is only one cycle of three years (10º, 11º and 12º years). Finally, higher education includes university and polytechnic education.

[8] This school signed a contract with the Ministry of Education, recognizing that it needed concerted intervention to solve four major interrelated problems: absenteeism, school abandonment, indiscipline, and school failure.

[9] The main features in the 3rd stage are: children start by thinking reasonably about concrete events, they start by understanding the concept of conservation; their thinking is more logical and organized, but is also very concrete; and they start by using inductive logic, or reasoning from specific information to a general principle. In turn, the main features in the 4th stage are: adolescents/teens/young adults start to think abstractly and reason about hypothetical problems; abstract thought emerges; they start by thinking more about moral, philosophical, ethical, social, and political issues that require theoretical and abstract reasoning; they start by using deductive logic, or reasoning from a general principle to specific information (e.g., Piaget and Inhelder, 1972).

A school consent form was sent to the direction of each school and a set of 423 consent forms were sent to the children's / teens' parents (school 1: 174; school 2: 71; school 3: 178), resulting in 307 authorizations and responses (school 1: 129; school 2: 57; school 3: 121); i.e., the total response rate was 73% (school 1: 74%; school 2: 80%; school 3: 68%).

The total sample of 307 students aged, from 6 to 16 years old, had a mean age of 10.13 (standard deviation = 2.54), being 145 (47.2%) males and 162 (52.8%) females.

The origin of the students was 129 (42.0%) from school 1, 57 (18.6%) from school 2 and 121 (39.4%) from school 3. As mentioned earlier, students were randomly divided into 2 groups, the experimental group (number, *n* = 153, 49.8%) and the control group (*n* = 154; 50.2%). Table 1 shows the sample characteristics divided into those groups.

Table 1. Sample characteristics by experimental and control groups

	Experimental group, EG (n=153)		Control group, CG (n=154)	
	n	%	*n*	%
Sex				
Male	76	49.7%	69	44.8%
Female	77	50.3%	85	55.2%
Total	153	100%	154	100%
School				
1	66	43.1%	63	40.9%
2	29	19.0%	28	18.2%
3	58	37.9%	63	40.9%
Total	153	100%	154	100%
Father education				
Preparatory/basic level (1º, 2º, 3ºcycles)	63	41.2%	75	48.7%
Secondary	54	35.3%	44	28.6%
Higher education	36	23.5%	35	22.7%
Total	153	100%	154	100%
Mother education				
Preparatory/basic level (1º, 2º, 3ºcycles)	42	27.5%	59	38.3%
Secondary	62	40.5%	44	28.6%
Higher education	49	32.0%	51	33.1%
Total	153	100%	154	100%
Age				
≤7	24	15.6%	17	11.0%
8-11	87	56.9%	88	57.2%
≥12	42	27.5%	49	31.8%
Total	153	100%	154	100%
Mean	10.03		10.24	
Standard deviation	2.43		2.64	

3.3. Ethical and legal considerations on the intervention

As obliged by the Belmont Report, conducted by the National Commission (1979) for the Protection of Human Subjects of Biomedical and Behavioral Research, this study has taken precautions over ethical principles. In terms of ethical and legal considerations, the work was carried out in line with Portuguese law. Thus, for private school the authorization forms consist in an authorization from the direction of the school, while for public schools consist in an authorization from both the Portuguese Ministry of Education and to the schools.

Furthermore, to guarantee full protection of the respondent students there was strict compliance with the ethical guidelines proposed by (Unicef, 2013; Greig et al., 2007) since respondents should not be at risk (Fowler, 2009). Parental consent is needed, and also the involved students were asked if they desired (or not) to participate given that is obviously not a mandatory task. In addition, to avoid bias in the method related to the eventual social desirability, it was explained to them that there were no right or wrong answers and that the information collected was absolutely anonymous and that, therefore, the individual results would not be distributed or explained (Podsakoff et al., 2003).

During the statistical data analysis in the next Section 4, all information that has been gathered is pooled so individuals' response remains confidential. Data will not be altered, or specifically selected to reach some specific results since it is considered unethical and bias due to using data to the advantage of the study. Finally, data that has been collected should be analyzed based on the original design. Additionally, care is taken during the analysis stage and in the presentation of data to avoid respondents being identifiable (Fowler, 2009).

On the day of the questionnaire response, prior to its distribution, following McNeal (1992) it has been taken into account the need to create a surrounding environment that guarantees positive feedback from the students, which facilitates the process of the students expressing themselves (Greig et al., 2007). Then, after the data was collected, it was said to the students that the experimental intervention was promoted by the authors. Hence, it became clear for the respondents that they were misled to the extent that they were involved in an investigation that included the marketing session.

3.4. Measures and structure of the questionnaire

To correctly evaluate what is desired and to respond safely to the hypotheses, it requires great care in the questionnaire design and delivery (e.g., Zikmund et al., 2010). It is suitable for a survey whose purpose is to measure the parameters of a particular group of people (e.g., students) or to make comparisons between groups (e.g., students subject to different interventions). The questionnaire, in appendix A, is composed by two parts: part one, as usual, containing personal details of respondents including: age, gender, and parents' education level, and part two includes six quantitative sentences, which intend to assess the considerations underlying the hypotheses.

In the responses, students are required to rate their decisions bearing in mind the Likert-type scale of five levels (Likert, 1932). This is a common tool in social surveys or questionnaires and is a unidimensional method of assessing responses: respondents indicate

the level of agreement or disagreement with a particular statement or question using an ordinal scale (Boone and Boone, 2012). The most common Likert-type scale uses a 5-point response system (e.g., Braun and Clarke, 2006; Guest et al., 2011; Boone and Boone, 2012), and we follow this scale: totally disagree (1), partly disagree (2), neither agree nor disagree/neutral (3), partly agree (4), and totally agree (5). Like in our case, the numerical code usually begins with 1 and has 1 value increments with each level (e.g., Braun and Clarke, 2006; Guest et al., 2011; Boone and Boone, 2012). Technically, a Likert-type scale is the sum of responses to several Likert items.

To evaluate the impact of the in-SMA on *students' preference for nutritious food and drinks* (H1), it is proposed the question "1. *I have a preference for nutritious / healthy food products (food and drink)*", based on "Q14. I prefer fast food over any other meal" of the "QuestionPro: Fast Food Survey Questions Template".[10] In our case, the question was formulated positively. It is also formulated in line with questions in (Krause et al., 2018, Table 2). To analyze the impact of the in-SMA on *students' awareness of the positive effects of healthy eating* (H2), it is proposed the question "2. *I believe that health relies on the consumption of nutritious/healthy food*", which is mainly based on "Q12. What are your thoughts on fast food consumption in relation to its health effects?" of the "QuestionPro: Fast Food Survey Questions Template". This question is also closely related with some questions in (Krause et al., 2018, Table 2).

To evaluate the impact of the in-SMA on *students' choice to bring healthy food home* thus affecting family habits (H3), it is proposed the question "3. *I advise my parents to buy nutritious/healthy food products*", which was based on questions in Doustmohammadian et al. (2017, Table 4): "Q37. I talk to my friends and family about healthy eating", "Q38. If I have any questions about food and nutrition issues, I'm able to get information and advice from parents, teachers, etc", "Q44. If my family were overweight and eating a high-fat diet, I would tell them to change their eating habits", "Q24_1. When I go shopping with my mother or father, I buy healthy snacks such as nuts, raisins, and dried chickpeas instead of chips, snacks, chocolate, and sweets", and "Q24_6 When I go shopping with my mother or father, I buy foods that are certified as healthy", among others.

To analyze the effect of the in-SMA on *students' superior levels of attitude towards brands of healthy goods* (H4), it is used the question "4. *Healthy food brands sell better quality products*", based on questions found in the following studies (Van Kooten et al., 2007; Kurdi, 2016); e.g., questions on "Behavioral consequences" in Kurdi (2016, pp. 344-348), which also use the Likert-type scale of five levels, aim to reveal the best quality of healthy food brands' products. To analyse the effect of the in-SMA on *students' superior levels of perceived brand reputation* (H5), it is used the question "5. *Healthy food brands are more reputable and therefore more advisable*", based on Stanaland et al. (2011), and Kurdi (2016, pp. 344-348). Finally, to evaluate the effect of the in-SMA on *students' perception that nutritious food and drinks firms want to improve sales* (H6), it is used the question "6. *Healthy product brands sell more*", based on Kurdi (2016, pp. 344-348).

[10] Available at https://www.questionpro.com/a/editSurvey.do .

3.5. Data analysis

We have conducted the statistical data analysis in the form of IBM SPSS Software 25 with the help of Microsoft Excel. In addition, the analysis of the impact of the group (experimental or control), the age, the gender, the school(s) and the parental education on the answers to each question is also performed through the use of econometric techniques suitable for binary dependent variables, and we have used the Eviews 11 software.

4. **Results and Discussion**

The experimental group obtained higher median scores in all proposed questions being these differences statistic significant ($p<.001$) according to the Mann-Whitney test in Table 2.

Table 2. Comparison of responses by group

Question	Experimental group, EG (n=153)	Control group, CG (n=154)	M-W test
Q1	5.0 (4.0-5.0)	4.0 (2.0-4.0)	$p<.001$
Q2	5.0 (5.0-5.0)	4.0 (3.0-5.0)	$p<.001$
Q3	5.0 (4.0-5.0)	4.0 (2.0-4.0)	$p<.001$
Q4	4.0 (4.0-5.0)	3.0 (2.0-4.0)	$p<.001$
Q5	5.0 (4.0-5.0)	3.0 (2.0-4.0)	$p<.001$
Q6	4.0 (3.0-5.0)	3.0 (2.0-3.0)	$p<.001$

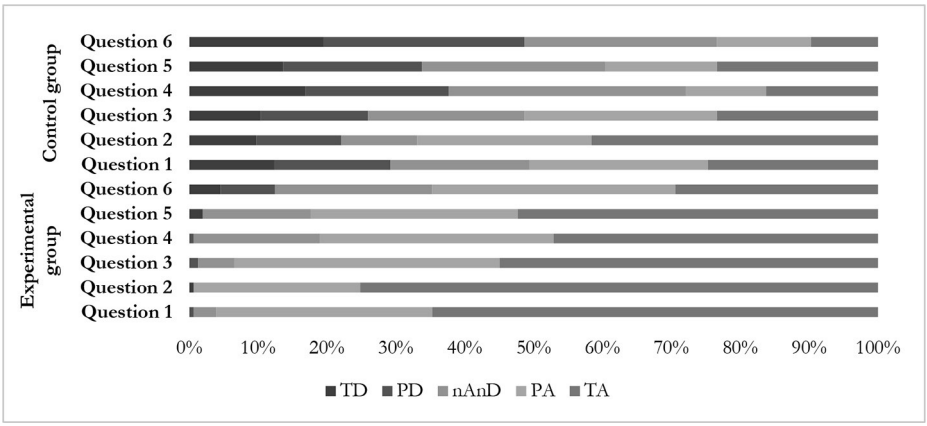
Notes: Results are presented in the format medians (percentile 25-percentile75); i.e., Mdn (P_{25}-P_{75}). M-W test is the Mann-Whitney test, also called the Wilcoxon rank sum test, which is a nonparametric test that compares two unpaired groups. If the *p*-value, *p*, is small, you can reject the null hypothesis that the difference is due to random sampling, and conclude instead that the groups are distinct; i.e., the score values of the groups, experimental and control, are statically different. If the *p*-value is large, the data do not give you any reason to reject the null hypothesis. This is not the same as saying that the two groups are the same. We just have no compelling evidence that they differ. $p<.001$ means for a significance level smaller than 0.1%.

Results confirm the formulated hypotheses H1-H6, showing that in-SMA had a positive effect on all of them. In-SMA contribute positively so that students have a preference for healthy food (H1), are aware that the consumption of these goods makes them healthier (H2), bias food and drink habits at home towards nutritious food and drinks (H3), show superior levels of attitude towards healthy food and drink brands (H4) and that these brands have superior levels of perceived reputation (H5), and have the perception that nutritious food and drinks firms will increase sales (H6). Thus, marketing actions affect the students' food choices (Story et al., 2009) and, when it comes to good eating practices, should be the school's priority to disseminate the best dietary practices (Valkenburg, 2000).

Figure 1 shows the distribution of the answers to the six questions divided into both groups, experimental and control. Results in Figure 1 visually confirm the ones presented in Table 2 with a higher prevalence of concordances obtained in the experimental group

(Mdn between 4 and 5), and discordances obtained in the control group (Mdn between 3 and 4). As stated above, the score value differences between groups are statistically significant.

Figure 1. Responses' distribution by group



Notes: TD = Total disagreement; PD = Partial disagreement; nAnD = Nor agree neither disagree; PA = Partial agreement; TA = Total agreement.

The results in Table 3 are relatively similar in the three different schools, with higher median scores for all questions in the experimental group. However, from the Mann-Whitney test: (i) for schools 1 and 3 (the public ones, attended by students of lower social classes) all questions had statistically significant differences ($p<.001$), thus approving the differences between groups, (ii) for school 2 (the private school, attended by students of higher social classes) Q4 ($p=.054$) and Q5 ($p=.514$) did not present statistically significant differences. Q4 is statistically significant for a significance level higher than 5.4% and Q5 is not statistically significant. Hence, at school 2 there was no statistical difference between groups in the answer to the Q5, probably because it is the school where students have best eating practices. Although the results are relatively similar in the three different schools, with higher scores in all proposed questions in the experimental group, in a thinner analysis, we observe slight differences in the score values of Table 3 among schools for questions 1, 3, 4, 5 and 6, which can be statistically captured by the econometric estimation of the logit specification in equation (1) and probably explained by the social group to which school students belong.

Table 3. Comparison of responses by group and school

	School 1 (n=129)			School 2 (n=57)			School 3 (n=121)		
Question	EG (n=66)	CG (n=63)	M-W	EG (n=29)	CG (n=28)	M-W	EG (n=58)	CG (n=63)	M-W
Q1	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	4.0 (4.0-5.0)	4.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	3.0 (3.0-4.0)	p<.001
Q2	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (5.0-5.0)	5.0 (4.0-5.0)	p<.003	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001
Q3	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	4.0 (4.0-5.0)	4.0 (3.0-4.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001
Q4	4.0 (4.0-5.0)	2.0 (1.0-4.0)	p<.001	5.0 (4.0-5.0)	3.5 (2.5-5.0)	p=.054	4.0 (4.0-5.0)	3.0 (2.0-3.0)	p<.001
Q5	4.5 (4.0-5.0)	2.0 (1.0-4.0)	p<.001	4.0 (3.0-5.0)	3.5 (3.0-5.0)	p=.514	5.0 (4.0-5.0)	3.0 (3.0-4.0)	p<.001
Q6	4.0 (3.0-5.0)	2.0 (2.0-4.0)	p<.001	4.0 (3.0-4.0)	3.0 (1.0-3.0)	p<.001	4.0 (3.0-5.0)	3.0 (2.0-3.0)	p<.001

Notes: See Table 2. p<0.001. p=0.054 and p=0.514 mean for a significance level smaller than 0.1%. equal to 5.5% and equal to 51.4%.

Looking at results by sex, Table 4 reveals that results were very close, with no noticeable differences between male and female students – there are higher median scores in all proposed questions in the experimental group. In particular, the Mann-Whitney test shows that results are all statistically significant for a significance level of 0.1%. Hence, gender does not introduce differences in eating habits. Moreover, Table 4 shows that the score values between males and females are relatively similar for all questions, which can also be apprehended and confirmed statistically by the econometric estimation of the logit model.

Table 4. Comparison of responses by group and sex

	Male (n=145)			Female (n=162)		
Question	EG (n=76)	CG (n=59)	M-W	EG (n=77)	CG (n=85)	M-W
Q1	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	4.0 (2.0-4.0)	p<.001
Q2	5.0 (5.0-5.0)	4.0 (3.0-5.0)	p<.001	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001
Q3	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	4.0 (2.0-4.0)	p<.001
Q4	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-3.0)	p<.001
Q5	5.0 (4.0-5.0)	*3.0 (2.0-4.0)*	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001
Q6	4.0 (3.0-5.0)	3.0 (2.0-4.0)	p<.001	4.0 (3.0-5.0)	2.0 (2.0-3.0)	p<.001

Notes: See Table 2. Remember that EG means Experimental group and CG means Control group.

Parent's level of education did not seem to affect the results of the in-SMA that was effective across all types of parent's education. Results are relatively similar across all types of parent's (father's or mother's) education, with higher median scores in the experimental group. Moreover, the Mann-Whitney test shows that results are all statistically significant.

Table 5. Comparison of responses by group and Parent's degree of education

	Preparatory/basic level (n=93)			Secondary education (n=104)			Higher education (n=110)		
Question	EG (n=38)	CG (n=55)	MM-W	EG (n=59)	CG (n=45)	M-W	EG (n=56)	CG (n=54)	MM-W
Q1	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	4.0 (2.0-4.0)	p<.001
Q2	5.0 (4 .0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (5.0-5.0)	4.0 (4.0-5.0)	p<.001
Q3	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	4.0 (3.0-4.0)	p<.001
Q4	4.0 (4.0-5.0)	3.0 (2.0-3.0)	p<.001	4.0 (4.0-5.0)	3.0 (1.0-3.0)	p<.001	5.0 (4.0-5.0)	3.0 (3.0-4.0)	p<.001
Q5	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	4.5 (3.0-5.0)	3.0 (3.0-5.0)	p=.006
Q6	4.0 (3.0-5.0)	3.0 (2.0-3.0)	p<.001	4.0 (4.0-5.0)	2.0 (2.0-3.0)	p<.001	4.0 (3.0-4.0)	3.0 (2.0-4.0)	p<.001

Notes: See Tables 2, 3, and 4. Preparatory/basic level means 1º (1-4 school years), 2º (5-6 school years), or 3º cycles (7-9 school years), Secondary education includes 10th, 11th, and 12th years.

Table 6. Comparison of responses by group and Father's level of education

	Preparatory/basic level (n=138)			Secondary education (n=98)			Higher education (n=71)		
Question	EG (n=63)	CG (n=75)	M-W	EG (n=54)	CG (n=44)	M-W	EG (n=36)	CG (n=35)	M-W
Q1	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	4.0 (2.0-4.0)	p<.001
Q2	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	5.0 (5.0-5.0)	4.0 (4.0-5.0)	p<.001
Q3	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.5-4.0)	p<.001	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p=.002
Q4	4.0 (4.0-5.0)	3.0 (2.0-3.0)	p<.001	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	3.0 (3.0-5.0)	p<.001
Q5	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	4.5 (4.0-5.0)	3.0 (2.0-4.5)	p<.001	5.0 (3.5-5.0)	3.0 (3.0-5.0)	p=.005
Q6	4.0 (3.0-5.0)	2.0 (2.0-3.0)	p<.001	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	3.5 (3.0-4.5)	3.0 (1.0-3.0)	p<.001

Notes: See Tables 2, 3, 4, and 5.

Table 7. Comparison of responses by group and Mother's level of education

	Preparatory/basic level (n=101)			Secondary education (n=106)			Higher education (n=100)		
Question	EG (*n*=42)	CG (n=59)	M-W test	EG (n=62)	CG (n=44)	M-W test	EG (n=49)	CG (n=51)	M-W test
Q1	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	5.0 (5.0-5.0)	3.0 (2.0-4.0)	p<.001	5.0 (4.0-5.0)	4.5 (2.5-5.0)	p<.001
Q2	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	3.5 (2.0-4.5)	p<.001	5.0 (5.0-5.0)	4.5 (3.0-5.0)	p<.001
Q3	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	4.0 (4.0-5.0)	2.5 (1.5-4.0)	p<.001	4.0 (3.0-5.0)	4.0 (2.5-5.0)	p<.001
Q4	4.0 (4.0-5.0)	3.0 (2.0-3.0)	p<.001	4.0 (4.0-5.0)	2.0 (1.0-3.0)	p<.001	4.0 (4.0-5.0)	3.5 (3.0-4.5)	p<.001
Q5	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	4.0 (4.0-5.0)	5.0 (4.0-5.0)	p=.014
Q6	4.0 (3.0-5.0)	3.0 (2.0-3.0)	p=.003	4.0 (4.0-5.0)	2.0 (1.0-3.0)	p<.001	2.0 (2.0-4.0)	3.5 (2.5-4.0)	p<.001

Notes: See Tables 2, 3, 4, and 5.

Tables 5, 6, and 7 reveal clearly that the score values between groups, experimental and control, divided by Parent's (father's or mother's) level of education are relatively similar for all questions, being the score values higher in the experimental group. The Mann-Whitney test reveals that the score values between groups are statistically different in the different levels of education: (i) basic, secondary and higher education levels, or (ii) without and with higher education, depending on the division considered. However, for example, looking at the Mother's level of education perhaps the biggest difference is in Q5, where, contrary to what is anticipated, the score values in the higher education level of the control group (Mdn = 5.0; P_{25} = 4.0; P_{75} = 5.0) exceed those of the experimental group (Mdn = 4.0; P_{25} = 4.0; P_{75} = 5.0), thus suggesting that the Mother's level of education is not a factor influencing the answer to Q5, maybe due to all Mothers, regardless of school background, are well-informed about the brands.

Tables 8 and 9 also confirm that age does not affect results. It proves to be effective for children with age smaller than 10 years old and for students with age higher (or equal) than 10 years old – see Table 8. Indeed, the results are different between groups, experimental and control, in both cases (students with age smaller than 10 years old and students with age higher (or equal) than 10 years old) and, from the Mann-Whitney test, they are statistic significant. However, from Table 9, when groups are divided according the Piaget's theory of cognitive development, the Mann-Whitney test shows that, for age ≤ 7, results are all statistically significant only for a significance level of 10% – e.g., the threshold level of significance for Q5 is 9.1%.

Table 8. Comparison of responses by group and age

	<10 (n=154)			≥10 (n=153)		
Question	EG (n=76)	CG (n=78)	M-W test	EG (n=77)	CG (n=76)	M-W test
Q1	5.0 (4.0-5.0)	4.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001
Q2	5.0 (5.0-5.0)	4.0 (3.0-5.0)	p<.001	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001
Q3	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001
Q4	4.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	4.0 (4.0-5.0)	3.0 (2.0-3.5)	p<.001
Q5	4.0 (3.0-5.0)	3.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001
Q6	4.0 (3.0-5.0)	2.0 (2.0-4.0)	p<.001	4.0 (3.0-5.0)	3.0 (2.0-3.0)	p<.001

Notes: See Tables 5, 6 and 7.

Tables 8 and 9 show that the biggest differences in the responses between groups, experimental and control, bearing in mind the age is in Q1, Q3, and Q5. This observation will be confirmed statistically later on by the logit econometric estimations. Thus, by performing a finer, more disaggregated analysis, considering, for example, age differences, we can capture details that would otherwise not be perceived.

Table 9. Responses comparison by group

	Age ≤ 7 (n=41)			Age 8-11 (n=175)			Age >11 (n=91)		
Question	EG (n=24)	CG (n=17)	M-W test	EG (n=87)	CG (n=88)	M-W test	EG (n=42)	CG (n=49)	M-W test
Q1	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p=.024	5.0 (4.0-5.0)	4.0 (2.0-4.5)	p<.001	5.0 (4.0-5.0)	3.0 (3.0-4.0)	p<.001
Q2	5.0 (5.0-5.0)	5.0 (4.0-5.0)	p=.028	5.0 (5.0-5.0)	4.0 (3.0-5.0)	p<.001	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001
Q3	5.0 (4.0-5.0)	4.0 (4.0-5.0)	p=.020	5.0 (4.0-5.0)	4.0 (3.0-5.0)	p<.001	4.5 (4.0-5.0)	3.0 (2.0-4.0)	p<.001
Q4	4.0 (3.0-5.0)	2.0 (2.0-3.0)	p<.001	5.0 (4.0-5.0)	3.0 (2.0-4.0)	p<.001	4.0 (4.0-5.0)	3.0 (2.0-3.0)	p<.001
Q5	3.0 (3.0-4.0)	3.0 (2.0-4.0)	p=.091	5.0 (4.0-5.0)	3.0 (2.0-5.0)	p<.001	5.0 (4.0-5.0)	3.0 (3.0-4.0)	p<.001
Q6	4.0 (3.0-4.0)	3.0 (2.0-4.0)	p=.029	4.0 (3.0-4.0)	2.0 (1.5-3.0)	p<.001	4.0 (3.0-5.0)	3.0 (2.0-3.0)	p<.001

Notes: See Tables 5, 6 and 7.

From Table 9 the score values are higher in the experimental group – i.e., close the response "totally agree" – than in the control group – in which the "totally disagree" response prevails. Interesting and as expected, taking into account the Mann-Whitney test – see the p-values –, results are more robust for higher age levels in Piaget's theory of cognitive development. It is also worth mentioning that the answer to Q5 is the only one that is not significant (p=0.91>0.05) for children aged 7 years and under. Thus, in particular, younger children, after an in-SMA, are convinced that healthy product brands have higher quality, Q4, but this does not change their perception of brand reputation, Q5, since the results report that it is not statistically certain that they consider the brands to be most reputable and, therefore, more advisable.

Estimation results by maximum likelihood of the econometric logit models (1), (2) and (3), which allow us to analyze the effect of the explanatory variables on the probability of choosing the responses "Partly agree" or "Totally agree", are in Table 10. The eighteen estimated models – three for each of the six Questions – are significant, overall considered, but this is not true for the majority of the explanatory variables, individually considered. Each Likelihood Ratio Statistic (LRS) value is used to evaluate the overall significance of the model, and results show that all models are statically significant at 1% of significance level. Alike, from the McFadden R^2 the predictive capability of the models, measured by the percentage of successes, is around 25%.

Individually, the explanatory variable *Gr*, group, is positive and statistically significant in all models, being, as expected, the most significant and relevant variable. The positive signal tells us that assisting the in-SMA contributes positively to the responses "Partly agree" or "Totally agree". Secondly, the explanatory variable *A*, students' age, is statistically significant in Q1, Q3 and Q5. As the coefficient associated with this variable is negative in Q1 and Q3, *ceteris paribus*, *A* contributes to worsen the probability of responding "Partly agree" or "Totally agree"; in turn, in Q5, *A* improves this probability. Thirdly, the explanatory variable *Sex* does not have a significant effect on the probability, and the education level of parents

– Fathers, *FEL*, and Mothers, *MEL* – only have significance in Q3. However, *FEL* improves the probability and *MEL* punishes it.

Finally, *ceteris paribus*, variable schools (individually or not) affects positive and significantly to the probability of an affirmative answer in Q1 and Q3, whereas it contributes negatively and significantly to the probability of affirmative answer in Q4, Q5 and Q6. Given the signs and statistical significance of the impact when specification (1) is considered; i.e., when individual schools are considered, then when are taken (i) public schools (schools 1 and 3) *versus* private school (school 2) – i.e., specification (2) – and (ii) primary or first cycle schools (schools 1 and 2) *versus* post-primary (second and third cycles) school (school 3) – i.e., specification (3);– the sign and statistical significance of the impact remain, although softened, as all schools, when considered individually, contribute – in sign and significance – in the same sense. To sum up, belonging to (i) schools 1, 2 or 3 individually, (ii) schools 1 and 3 (public) *versus* school 2 (private), and (iii) schools 1 and 2 (first cycle) *versus* school 3 (second and third cycles), affects positively and significantly to the probability of an affirmative answer in Q1 and Q3, whereas it contributes negatively and significantly to the probability of affirmative answer in Q4, Q5, and Q6.

Table 10. Estimated results from the logit model

Variable	Q1			Q2			Q3			Q4				Q5		Q6		
	Answer			*Answer*			*Answer*			*Answer*				*Answer*		*Answer*		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Gr	3.274	3.262	3.245	4.316	4.315	4.287	2.863	2.862	2.867	2.408	2.396	2.392	2.076	2.048	2.076	1.815	1.794	1.821
	0.457*	0.452*	0.448*	1.014*	1.011*	1.025*	0.391*	0.391*	0.390*	0.283*	0.281*	0.279*	0.272*	0.268	0.272	0.259*	0.257*	0.258*
A	-0.249	-0.146	-0.249	-0.064	-0.083	-0.059	-0.244	-0.243	-0.244	0.118	0.041	0.109	0.272	0.128	0.271	0.107	-0.012	0.116
	0.117**	0.060**	0.116*	0.135	0.067	0.133	0.125***	0.067*	0.125***	0.102	0.058	0.102	0.108**	0.056**	0.108**	0.100	0.056	0.099
Sex	-0.151	-0.180	-0.160	-0.151	0.062	0.032	-0.365	-0.365	-0.362	0.066	0.084	0.061	-0.136	-0.103	-0.135	0.292	0.309	0.291
	0.311	0.309	0.310	0.311	0.351	0.347	0.309	0.306	0.309	0.279	0.276	0.279	0.269	0.266	0.268	0.257	0.254	0.256
FEL	-0.013	-0.036	0.016	-0.094	-0.090	-0.040	0.430	0.430	0.421	0.067	0.078	0.095	-0.102	-0.076	-0.101	-0.095	-0.075	-0.119
	0.178	0.182	0.177	0.203	0.201	0.200	(0.197**	0.197**	0.195**	0.160	0.157	0.154	0.155	0.150	0.153	0.171	0.166	0.168
MEL	-0.126	-0.101	-0.098	0.215	0.209	0.268	-0.415	-0.415	-0.423	0.178	0.175	0.196	0.049	0.035	0.049	0.061	0.060	0.048
	0.178	0.181	0.174	0.198	0.194)	0.196	0.190**	0.190**	0.187**	0.161	0.158	0.159	0.166	0.160	0.164	0.179	0.176	0.178
Sc1	2.815			0.807			2.784			-2.964			-2.630			-1.977		
	1.127**			1.278			1.218**			1.047*			1.055**			1.023***		
Sc2	3.212	2.355		1.706	1.880		2.662	2.651		-2.632	-2.056		-2.624	-1.521		-2.261	-1.388	
	1.255**	1.020**		1.488	1.111***		1.311**	1.018*		1.148**	0.912**		1.153**	0.892***		1.094**	0.891	
Sc3	3.466		3.290	0.678		0.288	2.792		2.841	-3.443		-3.477	-3.531		-3.532	-2.714		-2.727
	1.589**		1.594**	1.873		1.827	1.702***		1.709***	1.422**		1.434**	1.467**		1.462	1.388***		1.386**
Sc1&Sc3		2.037			0.963			2.775			-2.416			-1.581			-1.126	
		0.902**			0.923			0.942*			0.836*			0.814***			0.832	
Sc1&Sc2			2.725			0.604			2.807			-2.962			-2.629			-2.006
			1.128**			1.262			1.224**			1.054*			1.054**			1.026***
McFadden R^2	0.283	0.281	0.282	0.290	0.290	0.283	0.277	0.277	0.276	0.234	0.232	0.232	0.173	0.166	0.173	0.141	0.136	0.139
LR Statistic	100.98*	99.981*	100.32*	81.037*	81.005*	78.988*	100.32*	100.32*	100.26*	99.211*	98.458*	98.583*	71.215*	68.427*	71.214*	59.326*	57.310*	58.788*
Log likelihood	-127.68	-128.18	-128.01	-99.137	-99.152	-100.16	-130.96	-130.96	-130.99	-162.00	-162.38	-162.31	-169.82	-171.21	-169.81	-180.89	-181.90	-181.16
Observations	307	307	307	307	307	307	307	307	307	307	307	307	307	307	307	307	307	307

Notes: (i) the dependent variable $Answer_i$ assumes the value 0 if the answer of the student i in the questionnaire is "Totally disagree", "Partly disagree" or "Neither agree nor disagree" and the value 1 if the answer is "Partly agree" or "Totally agree"; (ii) Gri assumes the value 0 if the student i belongs to the control group and the value 1 if she/he belongs to the experimental group; (iii) Ai corresponds to the age of the student i; (iv) Sexi assumes the value 1 if the student i is male and 0 if she is female; (v) FELi measures the father education level of student i, which can be 1st cycle (1), 2nd cycle (2), 3rd cycle (3), secondary (4), or superior (5); (vi) MELi measures the mother education level of student i, which can be 1st cycle (1), 2nd cycle (2), 3rd cycle (3), secondary (4), or superior (5); (vii) in specifications type (1), Scj assumes the value 1 if the student i belongs to the school j=1,2,3 and the value 0 if not; (viii) in specifications type (2), (Sc1&Sc3) assumes the value 1 if the student i belongs to the schools 1 or 3 and the value 0 if not; (ix) in specifications type (3), (Sc1&Sc2) assumes the value 1 if the student i belongs to the schools 1 or 3 and the value 0 if not; (x) significance levels of 1% (*), 5% (**) and 10% (***); (xi) the corresponding standard error is reported below the estimated coefficients.

5. **Concluding Remarks and Future Research**

Obesity in childhood and youth became a serious public health problem and the consumption of healthy (i.e., nutritious) goods and drinks during childhood and youth can improve the long-run health. There are several factors that affect the food choices of students, and one of these factors is marketing activities. In-SMA aimed at health-food firms will always be permitted and still encouraged, regardless of the restrictions that the law imposes now or in the future on the food sector, which is increasingly regulated. In this context, schools, as a closed and controlled space, have a powerful effect on how students eat, and we have analyzed if, indeed, in-SMA, driven by health-food agents, affect the behavior of the students, ensuring their loyalty as consumers and increasing the consumption of the respective goods/services in a sustained way. Hence, in-SMA should contribute to fight students' obesity and, thus, to rise health (and, in a near future, the productivity of all firms) and sales (and profits) of the respective firms, given that in-SMA also involve costs.

As in-SMA towards health-food goods and drinks firms are permitted and encouraged since they should positively affect the attitudes toward health-food goods and drinks and, thus, the willingness to consume them, our research questions make sense.

To answer the research questions, we have performed an experiment in three schools of the Porto district, being two of them from the Matosinhos county and one of them from the Maia county. Before the collection of the data by a questionnaire, the experimental group, which included 153 students and accounted for half of the classes per school, was exposed to an in-SMA. Our sample included 307 students aged from 6 to 16 years old: 129 from school 1, 57 from school 2, and 154 from school 3. After that, the data were treated on the basis of appropriate statistical and econometric techniques.

We have shown that school feeding plays an essential role in the students' lives because to perform any activity and ensure healthy growth, children and adolescents need to consume nutrients that contribute to the proper functioning of their body. Implementing public policies that alleviate or correct such problems is always needed and the schools are very important in this process. They accompany the student at various stages of their development, from early childhood to late adolescence and early adulthood. It, therefore, has a perfect environment to contribute to the generation of healthy eating habits that will be reflected throughout life. In addition, schools have the opportunity to meet the nutritional needs of individuals who may not have their needs met at home. Thus, the school needs to find strategies to feed

its students correctly, contributing to their growth, biopsychosocial development, learning, school performance and the formation of healthy eating habits. This can be done through food and nutrition education actions using in-SMA. These actions should be regulated by public authorities to assure that they contribute to encouraging healthy eating by suggesting balanced, healthy and safe meals that promote the health of students, avoiding sugars, fats (especially saturated) and salt.

The empirical part of our work allows us to emphasize five main conclusions. Owing to the in-SMA, the experimental group has obtained higher median scores for all the proposed questions, with significant results, confirming our hypotheses. Hence, in-SMA had effects on student consumption behavior and, thus, should be encouraged (and supported) by the authorities as a way to improve health. Secondly, the three different schools did not establish any noticeable difference on the results, with higher median scores for all the proposed questions on the experimental group; thus, there is apparently no need to adjust these actions relying on the school involved – private versus public and first cycle versus other cycles. However, there are slight differences in score values in both groups, experimental and control, among schools; e.g., in public schools, all questions had statistic significant differences, confirming the differences between groups, while in the private school, Q4 and, mainly, Q5 did not present statistically significant: differences. Moreover, belonging to (i) schools 1, 2 or 3 individually, (ii) schools 1 and 3 (public) versus school 2 (private), and (iii) schools 1 and 2 (first cycle) versus school 3 (2nd and 3rd cycles), contributes positively and significantly to the probability of an affirmative answer in Q1 and Q3, whereas it contributes negatively and significantly to the probability of affirmative answer in Q4, Q5, and Q6. Thirdly, results were very close between male and female students, so there is also no need to adjust the actions according to gender. Fourthly, the parent's level of education did not seem to strongly affect the results of the in-SMA, so that the action can be standard. Fifth, the students' age did not seem to strongly affect the results of the in-SMA between groups, although it affected some score values, which also implies that, generically, in-SMA should be independent of the students' age. The same can be said when the division attends Piaget's theory of cognitive development, although the results are statistically more robust at higher levels of development.

Therefore, the results are broadly in line with those found in the existing literature. In particular, we confirm that marketing actions affect the students' food choices, as suggested by, for example, Story et al. (2009), and, when it comes to good eating practices, they should be a priority in the school context, also as a means of disseminating the good dietary practices (e.g., Valkenburg, 2000). Furthermore, also in line with the literature which emphasizes that the attitude towards the brand is vital to affect the brand loyalty (e.g., Oliver 1999), our results reveal that in-SMA contributes to improving students' attitude towards the brands' associates to the action. In this sequence, the results also show that in-SMA can improve the brand reputation, which is a very valuable intangible asset for firms (e.g., Peloza, 2005; Roberts and Dowling, 2002) and, thus, relevant for the creation of competitive advantage, sales, revenue, and value in the financial market (Keller, 2008; Jandaghi et al., 2011; Feng et al., 2015).

Hence, it can be specifically said that our work allows us to confirm the existing results in a sample composed by three Portuguese schools, in a context that accommodates all the

six hypotheses considered together, and in a scenario of the specific in-SMA described. By detailing the aggregated data by socio-demographic variables, we have observed, in a finer analysis, results that would not be otherwise captured and, as far as we know, that are not (still) stressed by the literature; thus, we have observed: (i) results are statistically more robust for higher levels of Piaget's theory of cognitive development; (ii) the Mother's level of education is not a factor influencing the answer to the Q5, probably because all Mothers, regardless of school background, are well-informed on the brands and influence their children equally; (iii) there are slight differences in the score values among schools for Q1, Q3, Q4, Q5 and Q6, probably explained by the social group to which school students belong.

From the econometric analysis, in-SMA should namely be conducted in private schools if the concern is to improve the perception of the positive relationship between health and consumption of healthy goods, Q2, and the perception of better quality branded products associated with healthy products, Q4, and in public schools if students are intended to affect their parents' consumption, Q3. It also allows us to state that the coefficients associated with the age variable show that, at an early age, the in-SMA is more successful when it is intended to influence the preference for healthy products, Q1, and, through children, affect parents, Q3. However, if the aim is to affect the reputability of the brands, Q5, then acting on adolescents seems to be preferable. Moreover, more educated parents are more influenced by their children and the opposite happens with mothers, Q3.

This finer analysis should help the authorities to calibrate the in-SMA that, as we have seen, make perfect sense to ensure a sustainably healthy society.

The results of our study should be interpreted carefully, and only as indicating directions or trends that should be explored in the future. The need to build an in-SMA to apply only during one session, in a short period of time, the unique intervention with students in a classroom context and the difficulty in accessing parents should have created quite a few limitations. In the future, therefore, more activities should be carried out to produce changes in eating behavior and preferences.

Moreover, it would be interesting to extend the study to other schools in other districts of the country to verify the sensitivity of the results to the geographical location; e.g., comparing littoral districts with interior ones and urban versus rural areas. The small geographical area considered is not representative of the students' population and, as such, does not allow generalizations. In turn, since our study has focused on the short-run effect of an in-SMA, it would be necessary to analyze the effect of a similar initiative on the medium and long-run; it seems to us that it would be important to do a follow up a few months after the intervention to see if the changes last. Finally, another limitation that may be pointed out has to do with the fact that there are very few students in the sample who were visibly obese. It would have been interesting to analyze the pattern of responses between obese and non-obese students, considering, for example, an additional item in the questionnaire that had considered the relationship between age/height/weight. Finally, since our study is based on single items to measure the dependent variables, in future research multiple measures should be taken into account.

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Appendix

Questionnaire:

1. Personal data: Please fill in the missing information.

I am a boy: _____ ; I'm a girl: _____.

I'm _____ years old.

My father completed the following degree:

1st Cycle (1st, 2nd, 3rd and 4th years): ___; 2nd Cycle (5th and 6th years): ___; 3rd Cycle (7th, 8th and 9th years): ___; Secondary education (10th, 11th and 12th years): ___; Higher education: ___.

My mother completed the following degree:

1st Cycle (1st, 2nd, 3rd and 4th years): ___; 2nd Cycle (5th and 6th years): ___; 3rd Cycle (7th, 8th and 9th years): ___; Secondary education (10th, 11th and 12th years): ___; Higher education: ___ .

2. Here are 6 statements to evaluate what you think. For each one you should choose the answer that best fits what you think

	Disagree Totally	Disagree Partially	Neither agree nor disagree	Partially Agree	Totally Agree
1. I have preference for nutritious / healthy food products (food and drink).					
2. I believe that health relies on the consumption of nutritious / healthy food.					
3. I advise my parents to buy nutritious / healthy food products.					
4. Healthy food brands sell better quality products.					
5. Healthy food brands are more reputable and therefore more advisable.					
6. Healthy product brands sell more.					