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Research report

Perceptions and choices of Brazilian children as consumers of food products



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ABSTRACT

In order to identify children's perceptions about food choices and their behavior as consumers and influencers of food purchases, 16 focus groups were conducted with 71 students aged 8–10 years. Transcriptions were submitted to lexical analysis using the Alceste software. The initial contextual unit broke down into 1469 elementary contextual units, 84% of which were retained in the descending hierarchical classification. Results from the larger and more specific classes are reported here. Children were students from public schools where energy-dense nutrient-poor (EDNP) food consumption was severely restricted, but these foods were still bought by the children themselves or requested from their parents. Television shows and advertisements motivated food consumption in general, and consumption of EDNP foods was associated with social events and eating outside the home. Situations that emphasize the pleasure and satisfaction of not eating according to food guidelines are being addressed by traditional educational strategies directed at the individual. Appealing to the senses and employing visual stimuli to get to the affective component of children's attitudes seems to be an alternative tool for promoting healthy eating, instead of the traditional approach based on recommendations and restrictions.

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Introduction

Children's eating habits are determined, among a variety of factors, by food preferences. Energy dense nutrient poor (EDNP) foods are easily incorporated into food preferences (Birch, 1999). Because of their sweet taste, fruits are also considered tasty and therefore are more easily accepted by children; vegetables, on the other hand, tend to be rejected on the grounds of being sour or bitter and having unpleasant textures (Krølner et al., 2011). Therefore, vegetable consumption needs to be stimulated in order to become a learned preference (Dovey, Staples, Gibson, & Halford, 2008).

Taste, food marketing and brand recognition by children have been related to their preference for energy dense nutrient poor foods (Cairns, Angus, Hastings, & Caraher, 2012; Cornwell & McAlister, 2011). The situation led a number of countries to develop some kind of control strategy to restrict food advertising to children (Hawkes & Lobstein, 2011).

Parents influence children's preferences by making different kinds of foods available in the home environment, while children influence parents' choices by requesting specific food items (Birch, 1999; Cooke, 2007; McNeal, 2000; Patrick & Nicklas, 2005). Children recognize trips to the supermarket as opportunities to influence family

purchases and to have their preferences taken into consideration. Previous research indicates that parents do consider their children's opinions at the time of purchase, even when the child has asked beforehand and has not accompanied them (Kelly, Turner, & McKenna, 2006; Marshall, O'Donohoe, & Kline, 2007; Wilson & Wood, 2004).

Besides acting as influencers, children are also recognized as primary consumers, since they are able to make independent purchases with their own money. Also, preferences formed in childhood are often retained in adulthood (McNeal, 2000). As accomplished consumers, children are the target of a wide range of promotional channels such as television, internet, magazines, comic books and gifts. Television is still the most popular promotional channel, and the high frequency of commercials is said to exert a direct effect on children's food preferences and purchase behavior. The most common categories of food products promoted to children are sugared breakfast cereals, soft drinks, savory snacks, confectionery and fast foods (Cairns et al., 2012), and these are the same food groups that children tend to either buy for themselves or request from their parents (Marshall et al., 2007; Olivares et al., 2011; Özgen, 2003; Wilson & Wood, 2004). A similar situation has been identified in Brazil (Fiates, Amboni, & Teixeira, 2008).

Brazil, with over 195 million inhabitants, has the largest population of any South American nation; 50 million (23.3%) are children from 0 to 14 years, 84.4% of them living in urban areas. In 2010, the average monthly household income for of urban families was

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around 2400 Brazilian *reais* (€1040) and food expenditures accounted for about 20% of consumer spending (Brasil, 2011). According to National Surveys of Family Budgets, the household availability of fruits and vegetables is low, while the availability of processed, sugary, and fatty foods has been increasing (Brasil, 2004; Brasil, 2010a). Such availability appears to affect food intake by children, according to data obtained in 2008 by the Brazilian Food and Nutrition Surveillance System. Approximately half of the 26,000 children aged 5–10 years who were investigated had eaten sweets, chocolates, cream-filled cookies, crackers or packaged salty snacks on at least three occasions during the week preceding the survey. Meanwhile, only 3 in 10 children had eaten fruit and 1 in 10 had eaten vegetables on a daily basis (Brasil, 2009). Moreover, national data indicate that approximately one-third of Brazilian children are overweight (Brasil, 2010b).

The aim of the present study was to identify Brazilian children's perceptions about their behavior as food buyers and as influencers of food purchases, and about the motivators behind their food choices. Qualitative approaches are recommended to understand human behaviors, including in children, since they value participants and their perceptions. They can also highlight behavior aspects that quantitative methods fail to identify (Krueger & Casey, 2009; Pope & Mays, 1995). Nevertheless, it can be difficult for the analyst to avoid a tendency to privilege those comments that conform to his or her personal expectations (Dransfield, Morrot, Martin, & Ngapo, 2004). In 1986, a software called Alceste was developed in order to assist in data analysis and interpretation, helping to overcome such limits. Alceste could be described as a combination of textual and statistical analysis. The different word categories are generated automatically by the software, not by the researcher, thus increasing the objectivity of the process and reducing human influence (Guerrero et al., 2009; Reiner, 1986). To our knowledge, Alceste has so far not been employed in food and nutrition research with children. The use of the software enabled analysis of focus group transcriptions employing lexical analysis, what constitutes a rather innovative approach.

Method

This research is part of a larger study with an intergenerational approach, approved by the Human Research Ethics Committee of the Federal University of Santa Catarina (protocol 1140/10), and prepared in accordance with the ethical standards laid down in the 1964 Helsinki Declaration (World Medical Association, 2000).

Subjects

The study was conducted in Florianópolis, capital of Santa Catarina state, in the southern region of Brazil. All 10 municipal schools designated exclusively for children enrolled in the first four elementary school grades were included. The schools did not have canteens, and bringing snacks from home was actively discouraged by school management. All the schools benefited from the National School Meal Program. Since the development of independent consumer skills and persuasion and negotiation strategies appears more clearly from the age of 8 onwards (John, 2008; McNeal, 2000), this was the age group chosen for the present study.

Eight school principals agreed to participate and all 8- to 10-year-old students from the respective schools were invited – from both morning and afternoon classes. All children who handed signed consent forms on the designated day participated in the focus groups. Socioeconomic data were obtained from the children's registration cards.

Focus groups

Sixteen focus groups were conducted, including children of both sexes who studied in the same classes and were of approximately the same age (average variation of 1 year). Each group had a maximum of six children. The groups were led by a previously trained moderator and the discussions were recorded on two digital recorders. An observer was responsible for annotating nonverbal expressions and adding these to the transcripts.

Semi-structured script

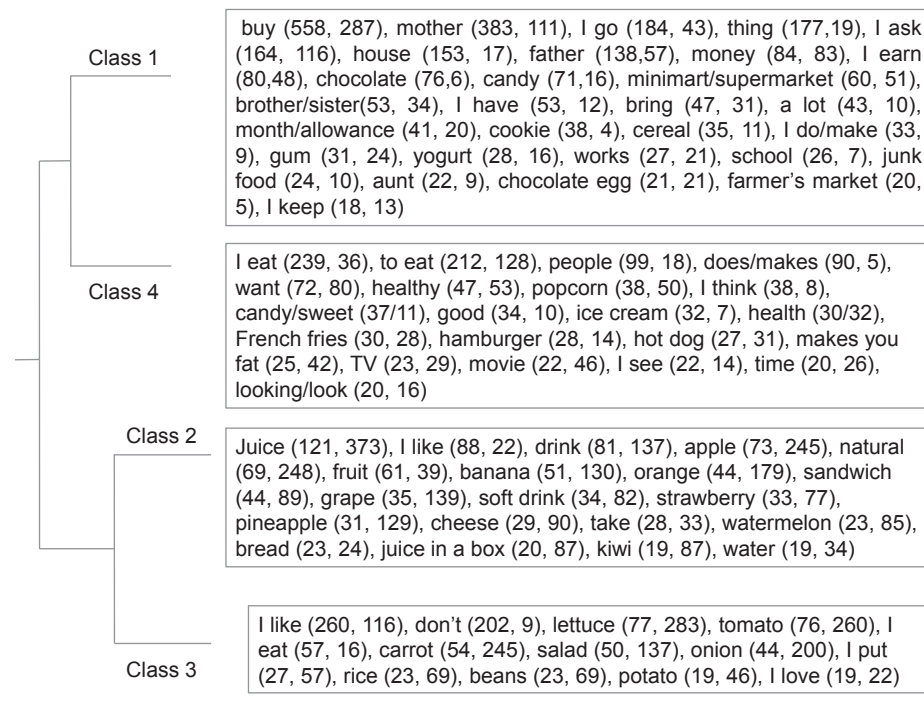
A semi-structured script following the stages suggested by Krueger and Casey (2009) was developed to guide the group discussions. Three focus groups were conducted in order to test the script, and the results were not considered in the analysis. The script was slightly modified after obtaining feedback from the pilot test. It was composed of two blocks of questions: the first about motivations for eating energy-dense nutrient-poor (EDNP) foods and for eating fruits and vegetables; and the second about behavior as buyers and as influencers of food purchases. Pictures of fruit and vegetables and of EDNP foods were used to stimulate discussion. EDNP foods included those with high levels of sugar, fat and salt that were prohibited from being sold at school cafeterias in Santa Catarina state (Santa Catarina, 2001) and those most advertised to and purchased by children (Cairns et al., 2012; McGinnis, Gootman, & Kraak, 2006). These were: sweets, salty snacks, fried snacks, soft drinks, artificial juices, “fast food” and sugary flakes.

Data analysis

After *verbatim* transcription of the recordings from the 16 focus groups, the moderator reviewed the transcripts, assembled them to form a single *corpus*, and organized them according to Alceste software (ALCESTE, V.4.5, Image, Toulouse, France) requirements. Alceste was used to assist in data analysis and interpretation.

Alceste conducts lexical analysis using the descending hierarchical classification method. It is based on calculations made about the concurrence of words in segments of text with the aim of synthesizing and organizing essential information in a textual database (Dransfield et al., 2004; Guerrero et al., 2009). It operates in the following five stages: (1) Text segmentation and word coding: the *corpus* is segmented into elementary units of context (EUCs), which are text segments that contain a characteristic idea. The words are classified using an internal dictionary; (2) Lemmatization: the words are reduced to their radicals and classified as “analyzable” (nouns, verbs, adjectives, adverbs, etc.) or “supplementary” (prepositions, pronouns, etc.); (3) Definition of a contingency table of “analyzable” reduced forms and elementary units of context (EUCs); (4) Top-down hierarchical classification analysis: performed to obtain stable classes and their significant words (tested by chi-square); (5) Class description to aid interpretation.

Following these analyses, the software generates a report. The significant vocabulary of each class, that is, the words which give sense to the classes, was selected based on the concomitant occurrence of the following criteria: (1) Higher than average frequency (17 times) of occurrences in the *corpus*; (2) Class association, determined by a chi-square value (χ^2) above 3.84 ($gl = 1$, indicating that the reliability of association between the word and the class is greater than 95%). Elementary Units of Contexts (EUCs) significantly associated to the classes were also identified based on a chi-square value above 3.84. EUCs are segments of text that contain a characteristic idea or a meaning. The same researcher responsible for conducting the focus groups interpreted the results based both on the significant words and on the significant EUCs of each class. The chi-square value associating words and EUCs to the classes enabled the



Class 1 contained 45%; class 2, 16%; class 3, 11% and class 4, 28% of the EUCs in stable classes.

Fig. 1. The dendrogram (from top-down hierarchical cluster analysis) and the major associated words (frequency >17 and $\chi^2 > 3.84$), the four classes, from the original recordings of the 16 focus groups.

interpretation of the classes' meanings, allowing the researcher to grasp the ideas that define each of them. To understand the content of the classes, the researcher must locate the significant words of each class on the significant EUCs.

Results

In total, 71 children (average age of 9.54 years, DP = 0.69) participated in the study, and 42 were girls (59%). All of them lived with their mothers and two-thirds of them lived with both parents. The average age of the mothers was 36 years (DP = 7.47) and of the fathers, 39 years (DP = 6.77). Eighty percent of families had an average monthly income of up to 2040 Brazilian *reais* (€ 887.00) at the time the data were collected. Approximately half of the mothers (51%) and fathers (55%) had less than 11 years of education. More than half of the children lived less than 2 km from school. It was noted that there was a food retail point near each of the eight schools.

The *corpus* submitted for lexical analysis was composed of an initial contextual unit that broke down into 1469 elementary units of context (EUCs). Of these, 1221 (84%) were retained in the descending hierarchical classification. This result is considered satisfactory, as it was expected that at least 75% of the EUCs would be classified. The *corpus* was divided into four classes. Figure 1 illustrates this division and indicates the percentage of the *corpus* that each class represents and the number of EUCs that compose each of them. It also indicates the characteristic words of each class in order of decreasing frequency.

Classes 1 and 4 are larger, and together they account for 73% of the *corpus*. Moreover, they are the most specific classes. High specificity is desirable since it indicates that the classes' themes are absent or rarely appear in the others. Low specificity indicates that the themes are shared among the classes. For these two reasons – greater

size and specificity – the present article explores and discusses the content dealt with in Classes 1 and 4.

These two classes (to be described later) include reports of children in two different roles. In the first, children appear as active individuals who choose, buy and exercise autonomy. They also make requests, negotiate with and influence their parents. In Class 4, children appear as individuals who are influenced and have their choices guided by different factors. Examples of characteristic words and elementary units of context (EUCs) associated with the classes ($\chi^2 \geq 3.84$) are reported to facilitate understanding. The characteristic words are italicized in the text and the characteristic EUCs are presented in Table 1.

Class 1 – Choosing what to buy: children as buyers and as influencers of food purchases

This class was organized around two verbs: *buy* and *ask*. The verb *buy* appeared when the purchase of food by children and their parents was discussed; with the help of the verb *ask* to make sense of children's actions of requesting and negotiating the purchase of products.

The results of this class revealed children's active role in influencing family food choices and making independent food purchases. Different nouns complement this meaning. As demonstrated by the words *money*, *month/allowance*, *work*, *have*, *earn* and *keep*, children had financial resources and mentioned means of obtaining them. The words *mother*, *father*, *sister* and *brother* identify the people involved in the buying and influencing processes. *Mother* and *father* are those responsible for family purchases and for bringing home requested foods. *Farmers' market*, *minimart*, *supermarket*, *home* and *school* characterize the specific food retail points and the location of such points of purchase. *Farmers' market* appeared as a place fre-

Table 1
Examples of Elementary Units of Context (EUCs) associated ($\chi^2 \geq 3.84$) to Classes 1 and 4.

From Class 1 (composed of 545 EUCs)	χ^2
I eat a lot of cereal, my father buys in the supermarket; chocolate too, but I have to control myself, otherwise I eat the whole bar	19
When my mother has some money left, gives me 2 or 3 bucks, I have a piggy bank where my father puts coins and sometimes I get an allowance from my mother too	18
I go to the minimart in front of my house and I buy a chocolate bar, then I share with my sister	13
I always earn a penny from my father, then I go buy a lollipop	12
My mother buys what we need, and, sometimes, I ask for gum and chocolate, chocolate I always ask for and she gives me	12
Near [school] there is a minimart and sometimes I buy cookies and things. I do not keep my money because I buy candy	11
I spend normally, junk food really. I go out with my friends, we go to the minimart and I buy lollipop, candy, gum, chocolate	9
When there is a farmers' market, my mom goes buy fruit	7
From Class 4 (composed of 347 EUCs)	χ^2
I think [fruit] is very tasty, has a very delicious taste, cool when it is very hot and it makes us healthy	30
I see a child eating a hamburger on TV and it makes me want	26
I only eat nuggets and French fries on Saturdays. I haven't eaten French fries in a long time, because otherwise they make you fat	26
[Fruits] are good and are good for your health. They are quite healthy and when I look at them a lot in the supermarket, it makes me want to eat them	21
It makes me want to eat it, seeing it all pretty like that. There are some pretty salads that make me want to eat them, we think it is good	17
I eat hamburgers at fast food restaurants and at the mall, and I eat popcorn at home and when I go to the movies	15
They are good [EDNPs]. The hard thing is that they are not healthy, but they are delicious! When we are going to watch a movie I eat popcorn	13
Sometimes I turn on the TV and it is showing a culinary recipe, things like that, so, it makes me want to eat fruit	11
It makes me not want to eat when it's dirty, at the Farmers' market, and everyone picks it up with their hands, when it is spoiled	7

mented by mothers where fruits, vegetables and homemade foods are bought. *Supermarket* indicates the place frequented by the family (including the children) where EDNP foods and other foods in general were bought. Children also identified *minimarts*, stores located near *home* and *school*, as places where they made independent purchases either alone or accompanied by friends or siblings. Therefore, places of independent purchases could differ from places of family purchases. In both cases, the associated words were *chocolate*, *candy*, *gum*, *cookie* and *junk food*.

Class 4 – Children choosing what to eat: influences on food choices

The words that define this class are *eat* and *want*. Children's perceptions about the food items discussed in the focus groups revealed what circumstances and reasons motivated them to eat such foods.

The words *good* and *see/look* were related to foods' sensory attributes in terms of taste and sight. *Good* was associated to the pleasant taste of certain foods that satisfy the senses and stimulate the desire to eat them. Besides taste, good appearance and presentation appeared as influences, while undesirable appearance reduced the desire to eat some foods. The verbs *see* and *look* were also mentioned in comments about television (TV). Not only food advertisements, but also TV programs were mentioned as stimuli for the desire to eat all kinds of foods, not only EDNP.

The term *healthy* was repeatedly mentioned in sentences stating which foods were good or bad for one's *health*. Although health properties appeared in the comments, motivations to consumption were more significantly linked to the previously mentioned taste and appearance characteristics. Regarding EDNP foods, children stressed *health hazards* such as *make you fat* and mentioned occasional consumption (a long time ago). Eating *hamburger*, *hot dog*, *chicken nuggets*, *French fries*, *popcorn* and *ice cream*, were associated with leisure activities such as going to the *movies*.

Discussion

Results evidenced and organized children's perceptions about their food choices and their behavior as consumers. According to the analysis, children shopped independently in local minimarts near their homes and schools and influenced their parents' purchases at the supermarket. Bought and requested items were EDNP foods not available at school. In fact, it has been reported that limiting access

to any given food stimulates the desire to eat it (Patrick & Nicklas, 2005; Savage, Fisher, & Birch, 2007). The presence of food retail points near home or school has also been related to children's food intake (Skidmore et al., 2009). In Brazil, a study which analyzed products sold to children at points of sale near their schools found that the cheapest and most available products were those rich in trans fats, resulting in a greater availability of EDNP foods at a lower cost (Silveira, Kliemann, Silva, Colussi, & Proença, 2012).

Parents were indicated as responsible for family food purchases, mostly at Farmers' markets and supermarkets. Only the latter, though, were characterized by children as places where they could influence their parents to buy EDNP foods. It is true that supermarkets provide a large array of EDNP foods with sophisticated marketing strategies employed by the industry (Hawkes, 2008; Monteiro, 2009; Popkin, 2006). But, since they also provide fruits and vegetables, strategies to promote healthy eating could also be present. For instance, an experiment that linked brands and characters with fruits and vegetables found that the strategy can be useful to stimulate children's consumption (Keller et al., 2012).

Television was mentioned as a motivator for the desire to eat all kinds of foods, not only EDNP ones. This was an interesting finding, since television's influence (especially from advertising) on children's preference for such foods has been widely reported (Marshall et al., 2007; Mehta et al., 2010). Television advertisements usually focus on pleasant experiences of taste, affection, reward and comfort, which is exactly the same approach chosen by the food industry to promote EDNP foods (Gomes, 2007). Alternatively, the same approach could be adopted by nutrition campaigns for promoting healthy choices, instead of the usual focus on nutrients, health maintenance and a reduction of the risk of disease.

Sensory attributes were frequently mentioned by children as motivators for ingestion. Visually appealing presentations have been found to have a strong effect on fruit consumption, and also play a crucial role in children's decisions about whether or not to eat vegetables (Heath, Houston-Price, & Kennedy, 2011; Jansen, Mulken, & Jansen, 2010; Krølner et al., 2011).

EDNP food brands were grouped with terms such as *health* and *fat*, and children mentioned trying to avoid frequent ingestion of these. Nevertheless, consumption of such foods was associated with leisure activities, birthday parties and eating out in the company of relatives and friends. Such situations are often regarded as inappropriate occasions for eating fruits and vegetables (Kirby, Baranowski, Reynolds, Taylor, & Binkley, 1995), and promote the

choice of EDNP foods (Warren, Parry, Lynch, & Murphy, 2008). Food preferences and sensory attributes tend to predominate over nutritional knowledge at the time of making food choices – the fact of knowing what is good or bad for one's health is not a strong enough factor to induce good eating habits (Fitzgerald, Heary, Nixon, & Kelly, 2010; Warren et al., 2008).

Therefore, one can argue that when faced with an environment where EDNP foods are widely available, strongly advertised and socially desirable, children cannot be expected to make consciously informed healthy food choices (Cohen, 2008). Stimuli directed at promoting healthy eating habits need to be available in all places and situations, namely those identified in the present study. Future research could focus on testing different strategies appealing to the senses in strategic places and situations, as an effort to increase the consumption of fruits and vegetables.

The use of focus groups enabled the observation of interactions, behaviors and attitudes that would not have been possible with interviews or surveys. Regarding data analysis, the chosen approach has its strengths and weaknesses. Use of the Alceste software reduces the chances of researcher bias and the need for complex triangulation methods. On the other hand, as this approach does not require exhaustive reading of the corpus, it can lead to a distancing between the researcher and the textual material. For this reason, it seems best that the same researcher responsible for conducting the focus group also be responsible for organizing the textual material and interpreting the results. Also, as the method emphasizes a collective representation, it is not possible to identify or analyze important but minor insights.

Conclusion

This study was conducted with a group of students from public schools where EDNP food consumption was severely restricted. These were exactly the foods most bought by the children and requested from their parents. Supermarkets, places where EDNP foods are widely available and made attractive to consumers due to sophisticated marketing strategies, were recognized as places where greater influence could be exerted by the children over their parents' food shopping. Television advertisements and shows appeared as strong motivators for food ingestion in general, not only EDNP foods. Consumption of EDNP foods was associated with social events and eating out, a situation that emphasizes the pleasure and satisfaction of not eating according to food guidelines. Consumption of EDNP is being facilitated by a number of factors that cannot be properly addressed by traditional strategies directed to the individual. Appealing to the senses and employing visual stimuli to influence the affective component of children's attitudes seems to be a possible alternative for the promotion of healthy eating. Such an approach could be adopted by social marketing campaigns applied to TV shows and advertisements, and also supermarkets. Educational strategies focused on the sensory and pleasure aspects of ingesting healthy foods such as fruits and vegetables could help to change the observed situation.

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