Can Public-Service Advertising Change Children’s Nutrition Habits?  
The Impact of Relevance and Familiarity

This study presents research conducted in France that builds (and tests) a framework for effectiveness of pro-nutrition public service announcements targeted at children. The study used the example of advertisements that encouraged children’s fruit consumption. “Child-relevance” of a campaign, which is created by using popular elements from commercial children’s food advertising, is found to be a key antecedent to effectiveness of pro-nutrition messages, both in terms of attitudinal and behavioral change. Further, it is also important to take care of the aspect of “campaign familiarity” and spend proportionate amounts of media budgets on public service messages in comparison to commercial food advertising.

INTRODUCTION

Obesity certainly has its origin in genetics, but nearly 70 percent of the prevalence is caused by changes in the lifestyles of children and their parents (AFSSA, 2004). Children today mature early as consumers. Contributing factors include their growing autonomous purchase power and their increasing influence on household purchases (especially in the context of dual-income households; McNeal, 1992).

Advertising of child-oriented food products ultimately exerts a significant influence on children’s attitudes and choices owing to the following:

- These advertisements capitalizing on the unique abilities and limitations of children (Scammon and Christopher, 1981)
- Children’s familiarity with television advertising for such food products—in contrast to their general lack of awareness of pro-nutrition public service announcements (PSAs; Gorn and Goldberg, 1982).

Further, there are very few reported instances of effective pro-nutrition initiatives, in terms of both significantly lowered rates of childhood obesity and increased fruit and vegetable consumption, in the commercial food sector and in public health (Froebisher, Jepson, and Maxwell, 2005; Murray, 2001; Seaman and Kirk, 1995). This performance comes despite a White House Conference on Food Nutrition and Health recommending as far back as 1970 that “tone, manner and feeling are crucial to this task in public education” (U.S. Government, 1970).

Traditional pro-nutrition campaigns—especially those targeted at children—generally may have been ineffective because they have tended to assume that improving nutritional knowledge results in changes in food habits (Seaman and Kirk, 1995), failing to realize the ways in which the tone and manner of such messages need to be tailored for children (Murray, 2001).

Academic research in marketing on the topic of pro-nutrition PSAs targeted at children has been limited. In the late 1970s, there were some studies whose primary objective was to document the likely negative effects of some television commercials (food advertising, for instance) and to examine what could be done to counter them (Galst,
Obesity certainly has its origin in genetics, but nearly 70 percent of the prevalence is caused by changes in the lifestyles of children and their parents.  

Similarly, “Food, Fun and Fitness Internet Program for Girls,” an American nutritional education campaign targeted at African-American girls between the ages of 8 and 10, successfully addressed the issue of childhood obesity. The series used Internet-based media and created culturally sensitive animated characters that depicted the girls and their varying health and nutrition-related habits and preferences (Flores, 2006). Preliminary results suggested that this program positively reinforced two types of behavior—consumption of fruit and vegetables and participation in physical activities.

Examining these findings in light of the proven effectiveness of child-oriented marketing and advertising (especially with respect to food products), these findings imply that creating food and nutrition concepts that conform to a particular target group’s (in this case children) expressed desires, values, and tendencies could be positive factors for the creation of effective nutritional campaigns. In fact, a “Junk Food” episode of CBS’s “Fat Albert and the Cosby Kids” television program influenced young viewers to select fewer sugared snack and breakfast foods, even though the program carried advertising for these food lines (Goldberg et al., 1978). Research indicates that the program may have been successful because it used a combination of animation and comedy to entertain children. In doing so, the young audience paid more attention to the meaningful nutritional themes of eating balanced foods and avoiding junk food (Goldberg et al., 1978).

The discussion appears further justified with the examination of research on the personal relevance of advertising messages, involvement, and advertising effectiveness. High personal relevance of an advertising message would seem to lead to thoughtful, systematic evaluation of advertising message and content (Petty and colleagues, 1979–1983), unlike messages with low relevance (Petty and Cacioppo, 1979, 1981; Petty, Cacioppo, and Goldman, 1981). Similarly, research also suggests that high personal relevance of advertising messages will lead to high attitude–behavior consistency.
Effectiveness of Child-oriented Food Advertising and Child-friendly Advertising Techniques

Research on short ad-like television nutrition messages (i.e., PSAs about nutrition) on children’s nutrition attitudes, beliefs, and behaviors suggests they are produced to capitalize on the unique cognitive abilities and limitations of children and, hence, potentially have a great deal of influence over children (Scammon and Christopher, 1981). The study shows that food advertising typically uses attractive and exciting celebrities/characters to associate food products with positive attributes and immediate rewards from consumption—actions that are conducive to the development of the kind of positive attitudes that will likely predict their consumption-related behavior toward the advertised foods (Scammon and Christopher).

A further review of academic literature proposes that there are six executional elements (or techniques) that have proved effective in children’s advertising (Maher, Hu, and Kolbe, 2006; Neeley and Schumann, 2004; Rust and Watkins, 1975; Wells, 1965):

• Children show highly favorable attitudes toward fantastic situations and elements such as monsters and science fiction.
• Children like demonstrations of product performance such as enhancement of their muscles or increase in their athletic capabilities.
• Animated spokespersons or characters are very effective in advertising—especially with very young children, who still sometimes have difficulties in reading and comprehending advertising messages. Such characters help children develop both product knowledge and brand preferences (Neeley and Schumann, 2004).
• Advertisements that use production techniques such as rapid movement, changes of scenes, innovative camera angles, animated voices, music, and a great deal of action have an advantage in maintaining the interest of the child viewer.
• Child-oriented advertising should not have heavy informational content and, instead, should focus on creating favorable attitudes or impressions through emotional messages and appeals.
• Children become highly involved in (and fascinated with) advertising that uses catchy slogans—specifically, plays on words, sounds, and phonetics.

Experts in the child-oriented marketing and advertising industries also support these observations about child-friendly advertising techniques. Paul Kurnit, a pioneer in youth-oriented marketing, in 1992 offered 10 tips to make children take more notice of advertising messages. Six of his choices were related to advertising execution and are very similar to what the academic literature reports (see Kraak and Pelletier, 1998, for details).

The discussion about child-oriented marketing includes examinations of animated brand spokespersons and depiction of cartoon characters in marketing material. A report by the largest consumer body in the United Kingdom suggests that cartoon characters can be an effective means of pushing children toward the consumption of foods high in fat, sugar, or salt (WHICH?, 2007). Empirical research with parents with children under the age of 16 supports this, as 75 percent of the interview subjects agreed that the use of cartoons in the packaging/promotion of unhealthy food had undermined their efforts to make their children eat more healthily (WHICH?). Similarly, there has been a long-standing controversy about the appeal of animated characters (i.e., R. J. Reynolds Nabisco’s Joe Camel) to young children. If such figural representations engage young children and their more mature target audience, there is speculation that such youthful interest may influence future behavior; in the specific case of Joe Camel, that fascination with the cartoon character might increase future intentions to smoke.

Brand Familiarity

In 1992, in the Journal of Consumer Research, Gerald J. Gorn and Marvin E. Goldberg (Gorn and Goldberg, 1982) found that candy advertising was significantly effective in encouraging children to choose candy over fruit as a snack. Their “Behavioral Evidence on the Effects of Televised Food Messages on Children” also suggested that children’s frequent exposure to television advertising may help explain this audience’s ready familiarity with the messages. The authors contrasted this finding with the fact that they were largely unfamiliar with the nutritional PSAs owing to infrequent exposure. To compete effectively with the barrage of messages for candy and other such food, Gorn and Goldberg wrote, the PSA advertisements must be aired frequently and continuously (Gorn and Goldberg, 1982).

Academic research on advertising effectiveness examines and discusses the relationships between attitudes toward advertising, attitudes toward brands,
and subsequent behavioral intentions. The findings often point to the moderating role played by factors such as brand familiarity in different aspects of the relationship (Batra and Ray, 1985; Machleit and Wilson, 1988).

STUDY OVERVIEW AND PROPOSITIONS
The present study is an exploratory effort to compare the effectiveness of two PSAs for fruit consumption for children (henceforth referred to as Fruit PSAs). The first was produced by the French government in 2005 (“Classic Fruit PSA”) and was well known to French children; the other was a Cartoon Network U.K. video clip (“Animated Fruit PSA”) translated into French and viewed by an audience largely unfamiliar with its content. (See “Methodology” section for details.)

A Basic Model of Child-oriented Fruit-PSA Effectiveness
Studies of advertising effectiveness of commercially advertised brands often have focused on an examination of the interrelationship between attitudes toward advertising (henceforth termed “Aad”), attitudes toward the advertised brand (“Ab”), and purchase intention (“PI”) or product selection. In 1996, Phelps and Hoy conducted the first study of this interrelationship with children. In the pages of *Psychology and Marketing*, they discussed “…the explosion of research in the past decade dealing with adults and the Aad-Ab-PI relationship.” This interrelationship assumes importance in an investigation of advertising effectiveness owing to two reasons:

- Aad is one factor that influences attitudes toward the brand and purchase intention (Cox and Locander, 1987; Thorson and Page, 1989).
- Understanding the role of advertising attitudes in the formation of brand attitudes has important implications for the attitude-formation process (Gardner, 1985).

The authors’ findings imply that there will be an interrelationship between children’s formation of attitudes toward PSAs about fruit; children’s attitudes toward consumption of fruit after exposure to the fruit PSAs; and children’s behavioral intentions toward fruit consumption. Furthermore, it also suggests that the child-relevance (and the familiarity) of the PSA will affect this string of relationships (See Figure 1).

**Figure 1** Model of Fruit PSA Effectiveness

![Diagram of Fruit PSA Effectiveness](image)

**Child-relevance and Attitudes toward Fruit PSAs**
An attitude toward advertising that is generated by specific cognitive components (humor, for instance) contrasts to what Terence Shimp, in a 1981 *Journal of Advertising* article, called a generalized “feeling” in response to an ad (Shimp, 1981). Other research has detailed that attitude can be created or altered by visual imagery without a verbal belief process occurring (Rossiter and Percy, 1980) and that a viewer who feels good about a commercial is likely to transfer the positive feeling to that product itself (Caldwell, 1981, as cited in Gelb and Pickett, 1983).

The PSA use of popular elements from child-oriented advertising could be one way of producing a cognitive component of advertising—or, more specifically, of such PSA “likeability” considerations as child-relevance (i.e. “this PSA is meant for children like me”). This possibility implies the following:

P1a: Cognitive components such as perceived “child-relevance” of Fruit PSAs will significantly influence children’s attitudes toward the PSA.

P1b: The Animated Fruit PSA will produce higher perceptions of “child-relevance” than the Classic Fruit PSA and, therefore, will produce more positive attitudes toward the PSA in children.
Attitudes toward Fruit PSAs and Attitudes toward Fruit after PSA Exposure

There seems to be a contradiction in the literature when the relationship between attitudes toward advertising (henceforth termed Aad) and attitudes toward the brand (henceforth termed Ab) has been examined using brand familiarity as a moderating influence. Machleit and Wilson (1988) hypothesize that the direct effect of attitudes toward advertising on attitudes toward brands will be significant in the case of unfamiliar brands as the positive evaluation or liking for the brand could act as information that may be used in developing brand attitude.

This is supported by the findings of prior research (see, for example, Batra and Ray, 1985; Edell and Burke, 1986; Messmer, 1979; Phelps and Thorsen, 1991).

In apposition is the suggestion that the relationship between Aad and Ab will be nonsignificant in the case of familiar brands, as the consumers’ brand attitude already has been well formed (Fazio and Zanna, 1981) and that an advertisement—even one they evaluate positively—should not have a strong effect on their brand attitude (Machleit and Wilson, 1988). This second theory is supported by the results of a study that report an insignificant Aad-Ab relationship in the case of familiar brands, when controlling for prior brand attitude (Machleit and Wilson; Machleit, Madden and Allen, 1990). Other researchers, however, have found a significant Aad-Ab relationship for familiar brands (Batra and Ray, 1985; Edell and Burke, 1986; Messmer, 1979). In this article’s examination of children’s attitudes toward fruit consumption after exposure to Fruit PSAs, this implies the following:

P2a: Children’s attitudes toward Fruit PSAs will influence their attitudes toward fruit after exposure to the Fruit PSAs.

P2b: The relationship between children’s attitude toward Fruit PSAs and their attitude toward fruit after exposure to the PSA will be significant, both in the case of the Animated Fruit PSA and the Classic Fruit PSA.

Attitudes toward Fruit after PSA Exposure and Intention and Behavior toward Fruit Consumption

The literature consistently shows a significant Ab-PI relationship in the case of adult samples (Brown and Stayman, 1992). It also is likely to hold in the case of concrete-operational children, as children in this stage of development already have developed abilities to form and hold stable attitudes according to Piaget (Phelps and Hoy, 1996; Piaget, 1981). This ability to hold attitudes suggests that these brand attitudes potentially are accessible after formation and could influence the purchase decision. That, in turn, implies a positive relationship between children’s brand attitude and their purchase intention. The results of Phelps and Hoy’s 1996 study strongly support this hypothesis as brand attitude explained more of the purchase intention variance than all other variables (Phelps and Hoy).

Phelps and Hoy (1996) also found the Ab-PI relationship is significant under both the familiar and unfamiliar brand situation. The relationship becomes stronger, however, under the familiar brand condition, and they attribute this change to two likely causes: the influence of repeated exposure to earlier ads for familiar brands or the influence of past experience (i.e., prior brand knowledge) in the formation of Ab for familiar brands. A single episode (“Junk Food”) of CBS’s “Fat Albert and the Cosby Kids” TV program, however, influenced children to make healthier snack choices, despite the presence of advertising during the show for highly sugared snack and breakfast foods (Goldberg et al., 1978). The authors attribute this to the episode’s success in being highly entertaining and relevant to the children and that the combination of animation and comedy is effective in gaining children’s attention. Consumers’ purchase intentions may be measured by the persuasiveness that they attribute to advertising (Gelb and Pickett, 1983) or by their choice of the advertised product, as depicted by one of the following measures:

• The stated intention to purchase the advertised product (Gelb and Pickett, 1983)
• The likelihood of asking for the product (Phelps and Hoy, 1996)
• Making product choices after exposure to advertising (Goldberg et al., 1978).

This evaluation of intentions leads to the following implications:

P3a: Children’s attitude toward fruit after exposure to the Fruit PSA will influence their perceptions of the persuasiveness of the PSA.

P3b: Children’s attitude toward fruit after exposure to the Fruit PSA will have a similar influence on the persuasiveness of the PSA, in the case of both the Classic and Animated Fruit PSAs.

P3c: Children’s attitude toward fruit after exposure to the Fruit PSA will influence their hypothetical choice of snack foods for that evening.
This ability to hold attitudes suggests that these brand attitudes potentially are accessible after formation and could influence the purchase decision.

P3d: Children’s attitude toward fruit after exposure to the Fruit PSA will have a similar influence on their hypothetical choice of snack foods for the evening, in the case of both the Classic and Animated Fruit PSAs.

Attitudes toward Fruit PSAs and Intention and Behavior toward Fruit Consumption
Unlike the Ab-PI relationship, the literature does not offer consistent support for the Aad-PI relationship in adults. Although some researchers have found that Aad does not directly influence PI (e.g., (Brown and Stayman, 1992; Homer, 1990; Mackenzie, Lutz, and Belch, 1986), others have found that there is a direct effect of Aad on PI, when brand familiarity is added into consideration (Thorson and Page, 1989). In other words, Aad is likely to have a direct effect on PI when brand familiarity is low and emotional impact is high (Thorson and Page, 1989).

In their work, Phelps and Hoy suggested, however, that children may not behave like adults with respect to this issue, and that, in fact, children’s attitudes toward the ad will have a significant direct influence on their purchase intention. They attribute this to the concrete-operational child’s inability to engage in meta-cognition—to think about their thought processes—as suggested by Piagetian theory (Phelps and Hoy, 1996).

From this perspective, concrete-operational children may not be conscious that their purchase intention response might be influenced by their attitude toward an ad. Research provides initial support for this contention both in the case of familiar and unfamiliar brands (Derbaix and Bree, 1997; Phelps and Hoy, 1996), although the strength of the relationship is questionable. As discussed, consumer’s purchase intentions may be measured both by persuasiveness and product choice. In this study, the Animated Fruit PSA is new and unfamiliar for French children but has more child-friendly elements compared to the familiar Classic PSA. This implies the following:

P4a: Children’s attitudes toward the Fruit PSA will have a direct influence on their perceptions of the persuasiveness of the PSA, both in the case of the Animated and the Classic Fruit PSAs.

P4b: Children’s attitudes toward the Fruit PSA will have a direct influence on their hypothetical choice of snack foods for that evening, both in the case of the Animated and the Classic Fruit PSAs.

Effectiveness of Child-oriented Fruit PSAs—a Deeper Examination
The literature suggests the need for deeper examination of the interrelationships in the basic child-oriented Fruit PSA effectiveness model using children’s age and gender as such considerations may affect—and thereby act as moderators of—the various relationships.

Advertising Engagement and Its Impact on Children’s Responses to Fruit PSAs
By producing a cognitive component of advertising such as personal-relevance or child-relevance, popular elements from child-oriented advertising can be used in PSAs to encourage children to eat fruit. A review of the literature suggests that that involvement appears to be essential to understanding most consumption behaviors (Dussart, 1983; Pechoux and Derbaix, 2002) and that the level of involvement influences the consequence of advertising message effects on attitude formation (Ephron, 2006; Harvey, 1997).

Although “involvement” may manifest itself in several ways, it can be broadly identified as “the degree of personal relevance and importance” of the advertising (Park and Young, 1986; Pechoux and Derbaix, 2002). Alex Wang, in the December 2006 issue of the Journal of Advertising Research, suggested that the engagement initiated by the contextual relevance of advertising—as defined by the Advertising Research Foundation in 2006—may be an important driver of involvement or personal relevance because engagement may be a precondition to creating the levels of personal relevance.

Arguing that children of different ages and genders may find different levels of contextual relevance in different types of Fruit PSAs, this implies the following:

P5: The influence of cognitive components such as perceived “child-relevance” of Fruit PSAs on children’s attitudes toward the PSA may be moderated by the gender and age of the children.

Attitudes Behavior Consistency in Children’s Responses to Fruit PSAs
Attitude-behavior consistency may occur to the extent that children form
Children age 10 or younger are capable of forming an attitude toward an advertised product because the advertising message is simple and because judgment immediately follows exposure to the message.

an attitude toward an advertised product, compare their attitudes toward the advertised product and the other alternatives, and select the alternative that they find most favorable (Roedder, Sternthal, and Calder, 1983). This process depends on a child’s age and the complexity of the decision task (Roedder et al., 1983).

Although children age 10 or younger are capable of forming an attitude toward an advertised product because the advertising message is simple and because judgment immediately follows exposure to the message (Austin, Ruble, and Trabasso, 1977), this same audience has been shown to have problems accessing previously stored information (Kobasigawa, 1977) and making comparative judgments (Case, 1978; Wartella, Wackman, Ward, Shamir, and Alexander, 1979). This implies the following:

P6: The relationship between attitudes toward the Fruit PSA and children’s intention and behavior toward fruit consumption in the form of perceptions of the persuasiveness of the PSA and children’s hypothetical choice of snack foods for the evening may be moderated by their age.

**METHODOLOGY**

**Subjects**

This study was conducted with children between the ages of 8 and 11 years with two objectives in mind:

- The children should be capable of responding to a simple paper-and-pencil questionnaire, a capability that is sufficiently developed by the age of eight (Goldberg et al., 1978).
- The children should be as young as possible, yet capable of understanding the commercial or persuasive intent of advertising—an ability that also has started to develop by the age of eight (Brucks, Armstrong, and Goldberg, 1988).

Subjects were drawn from three schools in suburban towns within a 20-kilometer radius of a major French city. The survey team took care that the children were properly matched in terms of socioeconomic background and family income—important considerations, in light of an Obepi 2006 study in France that demonstrated that people in lower income groups—including children—were more prone to bad food habits and excess weight. Although the schools participating in the study were a mixture of public and private schools, they were homogenous with respect to children’s parental income. Further, the classes were selected from the primary-school level CM (CM1 and CM2) so that the children corresponded to the age group required for the study.

The planning led to the selection of a sample of 143 French children between the ages of 8 and 11: 53 percent between 8 and 9 and 47 percent between 10 and 11 years of age. The sample also represented boys and girls equally.

**Experimental Stimulus**

Two Fruit PSAs were used for the experiment—one that already had been used by the French government and a second that had been specifically adapted for this study.

The first Fruit PSA—henceforth referred to as the “Classic PSA”—had been created by the French government’s Program National Nutrition Santé bureau. It depicts a little girl sitting at a kitchen table reading a book and reaching out automatically for her favorite sugary snack (chocolate cookies). She hesitates to finish reading the page, however, and by the time she stretches her hand out again, a bowl of fruit has replaced the bowl of cookies on the table. The basic message of the campaign: “Please Consume Lower Amounts of Sugar-Laden and Fatty Foods to Protect Your Health.”

The second Fruit PSA (“Animated PSA”) had been adapted from the Cartoon Network U.K. mini-series Elfy Food—the tale of a gang of five elves whose special powers come from fruit and vegetables. The cartoon clip, which specifically focuses on apples, was selected to match the French government’s classic PSA format and translated into French, with French voices overlaid on the English soundtrack. This PSA depicts a wizard sending five elves in search of Crunch-a-balls (the apple’s pseudonym in the mini-series). The elves play a football match with giant centaurs; the game is settled at the last moment when the elves find Crunch-a-balls and feed one to the little girl elf, who has the last penalty kick of the match. Her supernatural strength leads to a miraculous goal. The basic message of the campaign: “Once We’ve Eaten, We Can’t Be Beaten.”
Drawing upon the previous discussion of the literature, the Classic PSA has used some child-relevant execution elements such as bright colors and music and an appealing child protagonist and even animation (the bowl of fruit edges out the plate with chocolate cookies). The appeal to a younger audience, however, is heightened in the Animated PSA, which uses almost all child-relevant execution elements discussed heretofore, including animated spokespersons or characters; a fantastic situation; demonstration of product performance; rapid movement and changes of scenes; innovative camera angles, animated voices, music, and a great deal of action; verbal and visual humor; and a catchy slogan that plays on words, sounds, and phonetics.

This difference in style suggests that that there should be a comparable difference in the level of child-relevance of the two Fruit PSAs, which makes them ideal test commercials for the study. (The authors do acknowledge that the differences may be tempered somewhat by the Classic PSA familiarity to French children and the complete unfamiliarity with the Animated PSA.)

**Experimental Procedure**

Children were asked to fill in their demographic details during their free period. They then were taken to a viewing room in groups of 10 each and shown one of the Fruit PSAs. At the completion of the viewing, they returned to their classroom to complete the questionnaire.

**Study Variables and Measures**

Most of the variables for this study were measured using a four-point scale: (1) completely disagree; (2), disagree; (3) agree; and (4) completely agree. This form of evaluation is supported by academic literature that states that a four-point scale is a maximal level of discrimination for children in both American (Rossiter, 1977) and French (Bree, 1991) contexts. Further, children may have a tendency to opt for the neutral mid-point (“don’t know,” for instance) as a way of not paying attention to the question (Rossiter, 1980; Wells, 1965).

The age and gender of the child respondents were measured by two categorical variables, AGELEV and GENDER. AGELEV had two categories (1 = 8–9 years of age; 2 = 10–11 years of age), and GENDER had two categories 1 = boy and 2 = girl.

The multi-item variables used in this study—namely, the measures for attitudes toward Fruit PSAs and attitudes toward fruit after PSA exposure—had reliabilities above 0.60 for children exposed to both groups of Fruit PSAs, which is considered to be ideal for an initial phase of research (Nunally, 1967).

Personal relevance to the target audience—whether of commercial or public-service advertising—has been brought into consideration in only a few studies on adults (Darley and Lim, 1991; Petty et al., 1981; Petty et al., 1983). This has been done by manipulating the levels of personal relevance for the same advertisement in different experimental groups, with such words of explanation as “This public-service campaign is going to be telecast/not going to be telecast in your state.”

In the current study, because the two different PSAs with presumed levels of difference in personal relevance were being compared, the research team decided to create a statistical measure. Child-friendliness, a single-dimensional variable, was used to measure the level of child-relevance in both PSAs by asking children about their level of agreement with the following statement: “This advertisement is for children like me.”

A five-item scale ($a = 0.85$) measured children’s attitudes toward the Fruit PSA (adapted from Pecheux and Derbaix, 2002 by Van-Assche, 2005) and consisted of positive items such as “I like this ad”; “I find this ad great”; “I find this ad beautiful”; “I would like to see this ad again” and one negative item: “This ad bores me.”

A scale with three items ($a = 0.80$) measured children’s attitudes toward fruit after exposure to the Fruit PSA (from Arias-Bolzmann, Chakraborty, and Mowen, 2000 as adapted by Van-Assche, 2005) and consisted of items such as “I think fruits are good”; “I think fruits are agreeable”; and “I think fruits are enjoyable.”

As discussed in the previous section, consumer’s purchase intentions may be measured both by the persuasiveness that they attribute to advertising (Gelb and Pickett, 1983) and by their choice of the advertised product (Goldberg et al., 1978; Phelps and Hoy, 1996). After exposure to the Fruit PSA, the children’s behavioral intentions toward fruit consumption were measured in two ways in this study:

- The persuasiveness that they attributed to the Fruit PSA (Gelb and Pickett, 1983)
- The likelihood of their choosing fruit when faced with a hypothetical snack-food choice situation (Goldberg et al., 1978).

A single-dimension variable measured the level of persuasiveness of both Fruit PSAs by asking children about their level of agreement with the following statement: “All children would consider eating fruit after viewing this advertisement.”

Children’s snack choice was measured by giving children the following hypothetical situation: “Imagine that your
CAN PUBLIC-SERVICE ADVERTISING CHANGE CHILDREN’S NUTRITION HABITS?

parents have to go out for dinner this evening and have asked a baby sitter to take care of you. Since the baby sitter does not know what you eat for your evening snack after school, she offers you the following snack choices. Which one will you choose?” with the respondents offered four options: bar of chocolate; Nutella toast; fruit salad; an apple. These hypothetical snack choices were coded into two categories: unhealthy/sugary (bar of chocolate, Nutella toast) and healthy (comprising fruit salad and apple).

Pre-test
In a preliminary phase of research, the final French questionnaire was pre-tested among 20 children to ensure the children comprehended the questions. There were no problems observed, a likely finding as some of the scales/questions already had been used in France/Belgium (Pecheux and Derbaix, 2002; Van-Assche, 2005).

ANALYSIS AND RESULTS
The data analysis was carried out in four phases.

- The first phase examined the propositions P1a, P2a, P2b, P3a, P3c, P4a, and P4b using simple regression analysis.
- The second phase examined the propositions P3b and P3d using the Chumpitaz and Vanhamme (2003) moderator variable procedure.
- The third phase examined P1b, using an independent-samples t-test.
- The fourth phase examined P5 and P6 using a combination of simple regression analysis and the Chumpitaz and Vanhamme moderator variable procedure.

The results of simple regression analysis for both groups of children (one exposed to the Classic PSA, the other exposed to the Animated PSA) follow for both the attitude measures (See Table 1) and behavioral intention measures (See Table 2):

- P1a proposed that perceived “child-friendliness” of the Fruit PSA significantly would influence children’s attitudes toward the PSA. This proposition was supported in the case of both the groups. CFSCORE explains 18.6 percent of the variance in FRUTAD for the Classic PSA and 10.7 percent of the variance in FRUTAD for the Animated PSA.

- P1b proposed that the Animated Fruit PSA will produce higher feelings of “child-friendliness” compared to the Classic PSA and, therefore, will have a stronger influence on children’s attitudes toward the PSA. This hypothesis was not supported, as the Independent-samples t-test showed that there was no significant difference between the mean CFSCORE for both the PSA groups.

However, when the entire combined study sample was categorized into High CFSCORE (score = 3, 4) and Low CFSCORE (score = 1, 2), and another independent-samples t-test was conducted, the results showed that the mean score for FRUTAD (attitudes toward Fruit PSA) was significantly higher for the sample with the High CFSCORE. This result cannot be reported here, however, as the sample with Low CFSCORE constituted only 20 percent of the total combined sample. The results do indicate the need for further research to better examine this issue.

- P2a proposed that children’s attitude toward the Fruit PSA will influence their attitude toward fruit after exposure to the PSA for both types of PSAs. This proposition was supported.

### Table 1
Regressions for Attitude Variables

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Classic Fruit PSA</th>
<th>Animated Fruit PSA</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>P-Significance</td>
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<td>Predicting attitudes toward fruit PSA</td>
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<td></td>
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<tr>
<td>Child relevance</td>
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<td>&lt;0.01</td>
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<tr>
<td>Predicting attitudes toward fruit</td>
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<td></td>
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<td>Attitudes toward fruit</td>
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<td>&lt;0.01</td>
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### Table 2
Regressions for Behavioral Intention Variables

<table>
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<tr>
<th>Independent Variable</th>
<th>Classic Fruit PSA</th>
<th>Animated Fruit PSA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>P-Significance</td>
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<tr>
<td>Predicting persuasion</td>
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<td>Attitudes toward fruit PSA</td>
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<tr>
<td>Predicting choice</td>
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<td>Attitudes toward fruit</td>
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<td>Attitudes toward fruit PSA</td>
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</table>
FRUTAD explains 37.8 percent of the variance in AFTERFRU for the Classic PSA, and 5.2 percent of the variance in AFTERFRU for the Animated PSA. As the relationship is significant in the case of both the groups, proposition 2b also was supported.

- **P3a** proposed that children’s attitude toward fruit after exposure to the Fruit PSA will influence children’s perceptions of the persuasiveness of the PSA. This proposition was supported in the case of both the groups. AFTERFRU explains 37.6 percent of the variance in PERSUASION for the Classic PSA, and 7.5 percent of the variance in PERSUASION for the Animated PSA.

- **P3b** proposed that children’s attitude toward fruit after exposure to the Fruit PSA will have a similar influence on their hypothetical choice of snack foods for the evening, in the case of both the Classic PSA and the Animated PSA, as the moderating effect of PSA familiarity will be offset by the impact of child-relevance of the PSA. As P3a was supported for both the groups, this was tested using the Chumpitaz and Vanhamme (2003) $t$-statistic moderator test calculated using the unstandardized regression coefficients, standard errors, and mean square residuals of both the regression equations. The hypothesis was supported, as the $t$-statistic was lower than ABS (1.96), indicating no significant differences between the two groups.

- **P3c** proposed that children’s attitude toward fruit after exposure to the Fruit PSA will influence their hypothetical choice of snack foods for the evening. This hypothesis was supported in the case of both the groups. AFTERFRU explains 15.4 percent of the variance in CHOICE for the Classic PSA, and 6.9 percent of the variance in CHOICE for the Animated PSA.

- **P3d** proposed that children’s attitude toward fruit after exposure to the Fruit PSA will have a similar influence on their hypothetical choice of snack foods for the evening, in the case of both the Classic PSA and the Animated PSA, as the moderating effect of PSA familiarity will be offset by the impact of child-relevance of the PSA. As P3c was supported for both the groups, this was tested using the Chumpitaz and Vanhamme (2003) $t$-statistic moderator test calculated using the unstandardized regression coefficients, standard errors, and mean square residuals of both the regression equations. The hypothesis was supported, as the $t$-statistic was lower than ABS (1.96), indicating no significant differences between the two groups.

- **P4a** proposed that children’s attitudes toward the Fruit PSA would directly influence their perceptions of the persuasiveness of the PSA, for both the PSAs. This hypothesis was supported, as the relationship was significant in case of both the groups. FRUTAD explains 27.3 percent of the variance in PERSUASION for the Classic PSA and 18.2 percent of the variance in PERSUASION for the Animated PSA.

- **P4b** predicted that children’s attitudes toward the Fruit PSA would influence their hypothetical choice of snack foods for the evening, for both the PSAs. This hypothesis was partially supported, only in the case of the Classic PSA. FRUTAD explains 8.1 percent of the variance in CHOICE for the Classic PSA, whereas the relationship is not significant for the Animated PSA.

The results of simple regression analysis for both age groups of boys and girls (one between the ages of 8 and 9, the other between the ages of 10 and 11 years) for the attitude toward Fruit PSA measure (See Table 3) follow.

- **P5** proposed that perceived “childfriendliness” of the Fruit PSA will

### TABLE 3

Agewise and Genderwise Regressions for Attitude Toward Fruit PSA

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Younger</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>$P$ Significance</td>
</tr>
<tr>
<td>Predicting attitudes toward fruit PSA for the classic PSA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child relevance</td>
<td>N.S.</td>
<td>0.207 &lt;0.01</td>
</tr>
<tr>
<td>Predicting attitudes toward fruit PSA for the animated PSA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child relevance</td>
<td>0.251 &lt;0.1</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

| Boys                 | $R^2$            | $P$ Significance | Girls           | $R^2$            | $P$ Significance |
|----------------------|------------------|-----------------|------------------|------------------|
| Predicting attitudes toward fruit PSA for the classic PSA |                 |                 |
| Child relevance      | 0.236 <0.01      | N.S.            |                 |                 |
| Predicting attitudes toward fruit PSA for the animated PSA |                 |                 |
| Child relevance      | 0.155 <0.05      | N.S.            |                 |                 |
significantly influence children’s attitudes toward the PSA, but the relationship will be moderated by children’s age as the contextual relevance of the PSAs may be different for both the age groups. This hypothesis was supported. In the case of the Classic PSA, CFSCORE explains 20.7 percent of the variance in FRUTAD for the older age group, though the relationship is not significant for the younger age group.

In the case of the Animated Fruit PSA, conversely, CFSCORE explains 25.1 percent of the variance in FRUTAD for the younger age group, though the relationship is not significant for the older age group.

P5 also proposed that perceived “child-friendliness” of the Fruit PSA will significantly influence children’s attitudes toward the PSA, but the relationship will be moderated by children’s gender as the contextual relevance of the PSAs may be different for both the genders. This hypothesis is partially supported. In the case of the Classic PSA, CFSCORE explains 23.6 percent of the variance in FRUTAD for the boys, though the relationship is not significant for the girls. In the case of the Animated Fruit PSA, also, CFSCORE explains 15.5 percent of the variance in FRUTAD for the boys, but the relationship is not significant for the girls.

The results of simple regression analysis for both age groups of children (one for 8 to 9 years, the other for 10 to 11 years) are given for both the behavioral intention measures (See Table 4).

- P6 proposed that the relationship between attitudes toward the Fruit PSA and children’s intention and behavior toward fruit consumption in the form of (1) perceptions of the persuasiveness of the PSA and (2) children’s hypothetical choice of snack foods for the evening will be moderated by children’s age. This hypothesis was not supported for PERSUASION as the relationship appeared different for both groups, but the moderator test could not be conducted owing to the unequal size of the groups. In the case of the Classic PSA, ATTFRUI explains 22.3 percent for the younger age group and 56.6 percent of the variance in PERSUASION for the older age group. In the case of the Animated Fruit PSA, conversely, the relationship between ATTFRUI and CHOICE was not significant for either of the age groups.

**CONCLUSION**

The principal objectives of this study included the following:

- An examination of how the principles of child-oriented marketing can be used to enhance the personal relevance of PSAs for fruit targeted at children
- To enhance the way health-oriented PSAs are perceived (and utilized) by children in the formation of nutritional attitudes and behaviors (i.e., snack choices).

To this end, it was hypothesized that the use of popular elements from child-oriented advertising would add a cognitive component of “child-relevance” or “likeability” to PSAs about fruit—considerations that would aid in forming positive attitudes toward PSAs.

This hypothesis was partially supported for CHOICE. In the case of the Classic PSA, ATTFRUI explains 35.4 percent of the variance in CHOICE for the older age group, but the relationship is not significant for the younger age group. In the case of the Animated Fruit PSA, conversely, the relationship between ATTFRUI and CHOICE was not significant for either of the age groups.

**TABLE 4**

<table>
<thead>
<tr>
<th>Agewise Regressions for Behavioral Intention Variables</th>
<th>Younger</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predicting persuasion for the classic PSA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudes toward fruit</td>
<td>0.223</td>
<td>0.566</td>
</tr>
<tr>
<td><strong>Predicting persuasion for the animated PSA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudes toward fruit</td>
<td>0.376</td>
<td>0.075</td>
</tr>
<tr>
<td><strong>Predicting choice for the classic PSA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudes toward fruit</td>
<td>N.S.</td>
<td>0.354</td>
</tr>
<tr>
<td><strong>Predicting choice for the animated PSA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudes toward fruit</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

In PERSUASION for the younger age group, and only 7.5 percent for the older age group.
It is suggested that people in individualistic cultures will be more influenced by promotion-focused messages or messages that talk about attaining positive outcomes after purchasing/consuming the advertised product.

between Hofstede’s cultural dimensions and advertising messages (Aaker and Lee, 2001; Kim, 2006; Reardon et al., 2006).

It is suggested that people in individualistic cultures will be more influenced by promotion-focused messages or messages that talk about attaining positive outcomes after purchasing/consuming the advertised product.

Additionally, people in collectivistic cultures will be more influenced by prevention-focused messages or messages that talk about the negative outcomes that can be avoided by purchasing/consuming the advertised product.

Similarly, research shows that people in low uncertainty avoidance cultures will be more influenced by prevention-focused messages whereas people in high uncertainty avoidance cultures will be more influenced by prevention focused messages.

Examining France on Hofstede’s cultural dimensions, one realizes that France is an individualistic culture (with a score of 65) but also a culture that is characterized by very high uncertainty avoidance (with a score of 80). It, therefore, is a country wherein both promotion- and prevention-focused public-service messages may be relevant but with higher likelihood of acceptance of the prevention focus.

Therefore, the French government’s Classic PSA, which speaks about eating less fat- and sugar-laden foods, may have a higher cultural relevance for French children than the Animated PSA, which exaggerates the positive benefits of eating fruit. This, in turn, may add to the child-relevance scores for the existing French campaign and make them similar to the more child-friendly campaign.

Regrouping of the sample according to the “child-relevance” scores given to the two Fruit PSAs provided some more tentative support for the importance of making pro-nutrition messages relevant to children, as it showed that children who found higher levels of relevance in the PSA message had more positive attitudes toward the PSA. Future research needs to examine this finding.

Another objective of this study was to test a model for the effectiveness of children-targeted PSAs about fruit, studying the relationship between attitudes toward public-service advertising for fruit and attitudes toward fruit and behavioral intentions, keeping in mind the additional impact of “child relevance” and “PSA familiarity” (See Figure 1).

All but one of the research propositions was validated in this study; and even the last proposition was supported partially. Children’s attitude toward the Fruit PSA was found to influence their attitude toward fruit after exposure to both for the Classic and the Animated PSA.

Similarly, the results indicated that children’s attitudes toward fruit after exposure to the PSAs would significantly predict their future intentions to consume fruit, both as measured by their perceived persuasiveness of the communication and by their hypothetical snack choices. It was also hypothesized that the relationship would not be stronger in the case of the Animated PSA, as suggested in the literature, because the high degree of child relevance in the Animated PSA would offset the impact of familiarity in the existing French government campaign.

The results supported this. The Animated PSA was genuinely designed to be very child-relevant (although its reported CFSCORE was not significantly higher owing to cultural issues) and, hence, worked as well as the Classic PSA in terms of indirectly influencing future behavioral intentions in children by leading to the formation of strong positive attitudes toward fruit. This furthers the contention—that using animation and comedy to hold children’s attention and entertain them while delivering pro-nutrition messages can be successful in changing children’s snack-food preferences to less-sugary and healthy choices (Goldberg et al, 1978).

Further, the results of the study show that children’s attitudes toward Fruit PSAs also will have a significant direct impact on children’s future intentions to consume fruit, both in terms of their perceived persuasiveness of the communication and their hypothetical snack choices. The absence of a significant relationship between children’s attitudes toward Fruit PSAs and their hypothetical snack choice in the case of the Animated Fruit PSA appears to be somewhat justified when one examines the cautionary suggestion that the strength of the direct relationship between attitudes toward advertising and purchase intentions is questionable (Phelps and Hoy, 1996).
The fourth objective of this study was to conduct a deeper examination of the interrelationships in the basic child-oriented Fruit PSA effectiveness model using children’s age and gender as they may impact upon and will thus act as moderators of the various relationships. The results suggested that this could be possible although there was no direct moderating effect found.

Younger children and boys appeared to find the Animated PSA with the elves/centaur football match more engaging and contextually relevant as suggested by Wang (2006) than older children and girls. Those preferences may influence the relationship between personal or child-relevance and attitudes toward the Fruit PSA in some way, as this relationship was only significant for the former groups.

Further, although both the Classic and Animated PSAs produced attitudes toward fruit consumption that affected upon younger and older children’s perceptions of fruit, these attitudes only affect children’s hypothetical snack choices in the case of older children. The relationship between attitudes toward fruit after PSA exposure and hypothetical snack choice is not significant for either of the PSAs for younger children, indicating that younger children may find it difficult to show attitude-behavior consistency (Roedder et al., 1983).

Finally, for the Animated PSA, the only significant relationship—according to the PSA effectiveness model—was for the older age group of children’s attitudes toward fruit after PSA exposure and perceptions of how persuasive the PSA is in making children want to consume fruit in the future. This could imply that the Animated Fruit PSA with the football match between the child elves and the centaurs could be found less engaging and contextually relevant (Wang, 2006) for children aged 10 years and older, as they may perceive that they are too old for cartoons.

**IMPLICATIONS FOR PUBLIC POLICY**

There are not many instances of official nutritional education initiatives that can claim to have either significantly lowered the rates of childhood obesity or significantly increased the consumption of fruit and vegetables among children. This study used research from France to support the notion that the best way to create effective public-service campaigns on nutritional issues for children is to use elements from popular and commercial food advertising targeted at children. Such techniques result in higher personal relevance of the advertising message for the child, which, in turn, can lead to more careful processing of the nutritional message (e.g., Petty et al., 1983) and greater consistency between nutritional attitudes and behaviors (e.g., Sivacek and Crano, 1982).

This study also confirms the reason behind the success of early pro-nutrition initiatives carried out by commercial television programs such as CBS’s “Fat Albert and the Cosby Kids” in the 1970s (Goldberg et al., 1978). In fact, results of the study show that approximately two-thirds of the children studied had chosen apples—the fruit present in both PSAs executions—as their snack.

Governmental organizations that have been formed primarily to disseminate health and nutrition messages to children in their respective countries also should take note of the effectiveness of the Fruit PSA created by France’s Program National Nutrition Santé. This campaign already has found relevance among its target audience by incorporating bright colors, an appealing child protagonist, and engaging animation and music. A campaign with higher child-friendliness or relevance may work even better.

Some of the differences in results between the Classic and Animated PSAs may provide support for the proposition that governmental organizations promoting the cause of health and nutrition need to spend proportionate amounts of communication budgets in comparison to companies advertising sugary, fat-laden, and unhealthy snacks and foods to make their communication campaigns as familiar to young children as those popular food advertisements are (Goldberg et al., 1978).

Understanding the link of attitudes toward ads (and behavioral intentions, in particular) would assist in the development of PSAs covering a variety of areas ranging from road safety to health and nutrition (Phelps and Hoy, 1996). This study extends concepts from the field of
This study extends concepts from the field of advertising effectiveness into the arena of PSAs. It also provides validation of the proposed relationships, in the French context, with PSAs that are aimed at encouraging children to eat fruit.

This study provides preliminary validation of the fact that characters and communication campaigns with similar levels of child-appeal or child-relevance (as termed in this study) to animated brand spokespersons such as Joe Camel (or those cartoon characters depicted in popular food product packaging) can be created and will prove effective in conveying public service messages to young children.

It also would serve public-service communication professionals well to be cautious and judicious in the use of child-friendly animated characters to convey messages to children. Although an animated spokesperson may work very well to promote an issue, creating an entire campaign just using animated characters, tone, and manner may lead to a loss of relevance for older children.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

First, this study uses a small-sample size and needs to be supplemented by large-scale studies using bigger sample sizes and different types of PSAs.

Second, the results of the study cannot be generalized to all children, even in France. Children below the age of eight years were not included in this study because of academic debate and speculation about their inability to understand the persuasive intent of communication, which is linked to differences in their cognitive ability when compared to older children. Because of this, the results of this study may not apply to very young children. Future research should look at examining the effectiveness of PSAs for Healthy Eating habits, even among very young children, because they are also at high risk of obesity due to continued exposure to attractive messages for sugary and unhealthy foods and snacks.

The third limitation of this study concerns the differences between the two types of PSAs for Fruits used for the study. There were four types of differences in the two Fruit PSAs which could be limiting for the study. First, the French government Fruit PSA was a finished campaign created by professionals, while the Animated Fruit PSA was created by the authors themselves, using video clips from Cartoon Network UK and dubbing and adapting them into French using computer software. Second, the French government Fruit PSA, although not as ‘child-friendly’ in execution as the other, was more familiar to the French children as they would have viewed it on television prior to the study, whenever it was last broadcast, although it was difficult to find official data to confirm how far back that was. The Animated Fruit PSA on the other hand was very ‘child-relevant’, but also unfamiliar for the French children.

Third, the literature suggests that the French government’s Fruit PSA may be more culturally relevant than the new Fruit PSA adapted from the Cartoon Network, as this has a prevention-focused message which is more applicable given the French tendency to avoid any kind of uncertainty. These two limitations had an impact upon the perceived ‘child-relevance’ of the Fruit PSAs by possibly mitigating the differences between them, as has been discussed earlier. Future research focusing on an examination of the impact of ‘child-relevance’ in nutritional PSAs should take care in this respect.

Finally, there also were differences in the time duration of the two PSAs: the Classic PSA lasts just 20 seconds; the Animated PSA is more than two minutes long. Such temporal differences may actually be an advantage rather than a limitation, however, with respect to children’s future intention to consume fruit. Appropriately designed program-length television material (such as CBS’s “Fat Albert and the Cosby Kids” show) can more effectively influence children’s eating habits than the short advertisements that they normally see (Goldberg et al., 1978). It also may be useful to examine if the “Fat Albert” approach (with 24 minutes of programming) could be effectively adapted to a more practical PSA-length format (Goldberg et al., 1978). The current study provides some preliminary support for this. The two minutes of the Animated PSA exceed the traditional 30- or 60-second length of most PSAs but still were effective in influencing both children’s attitude toward fruit as well as their snack consumption behavior. This illustrates that the approach of creation of “message relevance” in nutrition-education campaigns can work well even in a shorter format.

Childhood obesity driven by nutritional imbalances in nutrition is a global concern.
Drawing upon the previous discussions, three areas for future research seem to emerge as follows:

- This study can be extended into a large-scale study of similar types of PSAs also highlighting other public-service concerns such as consumption of vegetables, cigarette smoking, excessive consumption of alcohol, or consumption of drugs, using similar concepts such as target audience “relevance.”
- Additional research could examine the use of a special animated character or spokesperson to convey positive public-service messages in the health and nutrition or anti-addiction arena.
- Future research should examine the role played by cultural context in effectiveness of pro-nutrition campaigns—especially those aimed at children—by examining different types of nutritional messages and public-service advertising appeals across cultures.

Childhood obesity driven by nutritional imbalances in nutrition is a global concern.

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