

Behavioural evidence for the effectiveness of threat appeals in the promotion of healthy food to children

Karine M. Charry and Nathalie T.M. Demoulin
IÉSEG School of Management (LEM-CNRS 8179)

The current paper investigates the effectiveness and the persuasion process of threat appeals on children. Disregarded by scholars, probably for ethical reasons, the study of negative appeals targeting 8- to 12-year-olds to promote healthy food seems nevertheless relevant, in the unprecedented context of childhood obesity. To test our assumptions, an experiment was set up with 126 children. Results indicate that the appeal is effective and that the persuasion process of threatening advertisements is led by affective reactions. In contrast to earlier research on older targets, cognitive processes do not improve its effectiveness. Furthermore, exposure to threat appeals increased pre-adolescents' healthy food consumption in comparison with appeals that may be considered more 'typical', such as fun and action. These conclusions and a teleological perspective of ethics invite further study of threat appeals targeting children.

Introduction

For more than five decades, fear and threat appeals have received a fair amount of attention. Consisting of 'a source stating that some negative outcome will result – or increase in likelihood – as a consequence of non-compliance with the source's recommendation' (Donovan & Henley 2003, p. 80), threat appeals appear to be able to influence individuals' attitudes and behaviours. Evidence of the effectiveness of threats has been provided in many instances, especially in health promotion campaigns (Dickinson & Holmes 2008). Nevertheless, research indicates that the persuasiveness of threat appeals may be moderated by a number of factors, notably the sociodemographic characteristics of the target (Burnett & Oliver 1979). Donovan (1991) concluded that the question is not whether threat appeals can be effective but 'where' and 'for whom' they can be effective.

This research addresses the question of 'for whom' threat appeals may be effective, expanding the existing body of literature to include a much younger target: 8- to 12-year-old children. However, the aims of this research extend beyond a mere replication using a new age group. First, effective behavioural changes are considered,

which is rarely done in advertising research. Showing significant changes in children's consumption appears to be the indisputable way to demonstrate effectiveness. Second, this research investigates the respective roles of negative affective reactions and message elaboration – or cognition – in the effectiveness of negative appeals on children. Although research on adults now acknowledges the central role of emotions in threat appeals (Norman *et al.* 2005), the cognitive dimension of the persuasion mechanism remains essential. Therefore, the original theoretical contribution of this research is twofold. First, it evaluates the effectiveness of negative affective reactions elicited by advertisements designed to produce such reactions. Until now, appeal and affective reactions of positive valence are the only ones that have been studied when children are the target. Second, the respective influences of affect and cognition are investigated.

One could reasonably question the relevance of studying the impact of negative appeals on such a young target. We argue that social marketing and specific social issues could benefit from this type of study. Childhood obesity, for instance, is a particularly pressing problem in need of a solution. With 19.6% of 6 to 11 year olds in the United States (Ogden *et al.* 2010), 27% of children under the age of 15 in China (O Cheng 2004) and about 20% of children in Europe (European Commission 2007) being obese, obesity has reached epidemic levels, and ranks as the fifth highest risk for death globally (WHO 2010). In reaction, many countries have implemented numerous interventions focusing on improved nutritional education for children, their parents and/or their schools, and physical activity. However, recent reviews suggest that only four out of every ten actions are considered effective (Doak *et al.* 2009), while only 5% of interventions have long-term effects (Stice *et al.* 2006). In some countries, advertising bans are also applied, but the effectiveness of such approaches appears limited, as broadcasting boundaries are absent in today's media environment (Nairn & Fine 2008; Doak *et al.* 2009). Moreover, evidence of the direct impact of advertising on children's food choices is mixed (Ambler 2006; Nairn & Fine 2008; Wilcox *et al.* 2009) and 8 to 12 year olds demonstrate a good understanding of advertisers' common persuasive tactics (Rozendaal *et al.* 2011). Nevertheless, it is possible that the heavy marketing pressure of junk food companies distorts children's perception of a balanced diet and that, consequently, any healthy food messages would contribute to shaping more realistic perceptions (Goldberg & Gunasti 2006). Unfortunately, advertising campaigns for healthy food based on 'fun', 'fantasy' and 'action/adventure', the promotional appeals typically used by the food industry when targeting children (Bandyopadhyay *et al.* 2001; Roberts & Pettigrew 2007), may not be strong enough to counter the industry's pressure. It would require an exceptionally original advertisement to balance the ones heavily broadcasted by this industry. Obesity prevention seems to call for stronger tools.

Threat appeals may represent a relevant option. Their effectiveness has been demonstrated for slightly older targets in health prevention contexts (for instance drug abuse (Schoenbachler & Whittler 1996) and tobacco use (Pechmann *et al.* 2003; Dickinson & Holmes 2008)). Furthermore, threat appeals, thanks to their distinctiveness, may indeed counterbalance the heavy marketing pressure of the junk food industry.

Theoretical foundations and hypotheses

Effectiveness of threat appeals

During the last 50 years, empirical studies have demonstrated the effectiveness of fear and threat appeals (see Donovan & Henley 2003; Gallopel-Morvan 2006 for reviews). In health prevention research, meta-analyses also support these findings (Milne *et al.* 2000; Witte & Allen 2000). The Protection Motivation Theory (PMT) (Rogers 1975) appears to be the most widely accepted and theoretically robust model (Norman *et al.* 2005; Gallopel-Morvan 2006), and it has been empirically validated (Milne *et al.* 2000). The PMT specifies the conditions that determine the effectiveness of threatening advertisements. A threatening message is effective if the target (1) perceives the threat as severe, (2) considers the probability of its occurrence as realistic, (3) evaluates the solution offered as efficient, and (4) considers the solution to be workable. Although this research does not intend to study the variables of the PMT model, these elements suggest that integrating a plausible threat and an efficacious solution in messages is essential to the message's effectiveness. This will be of importance when creating effective threat appeals.

Children as a relevant target

Some have argued that parents should remain the primary targets of prevention campaigns. However, in western societies, consumption autonomy increases significantly at pre-adolescence (Kline 2010). According to recent French statistics, 'twens' (8 to 12 year olds) spend up to 21% of their pocket money on food. The literature also emphasises that many consumption behaviours are established before the age of 12 (Peracchio & Luna 1998), and Freeman and Brucks (2002) stressed that children tend to prefer goods that have not been imposed on them. Lastly, the prevention of obesity appears to be far more efficient than its treatment (Ebbeling *et al.* 2002; Stice *et al.* 2006). Consequently, persuading the target during this developmental period seems all the more relevant.

Persuasion among children

Advertising research considers children as specific targets rather than as 'mini adults'. This differentiation is rooted in children's cognitive capacities, which are still developing (Roedder John & Cole 1986) and which affect their abilities as consumers (Roedder John 1999). In the literature about advertising persuasion, and in contrast to adults, children's affective reactions elicited by advertisements appear to be the main, if not the sole, driver of their intentions to behave (Phelps & Hoy 1996; Pecheux & Derbaix 2002b). The prevalence of the affective dimension in children's attitude formation and consistency may be explained by the pre-adolescent's stage of cognitive and emotional development. According to Piaget (1981), emotion is the energiser and director of children's thoughts. Although children's evaluations in pre-adolescence are not based solely on highly perceptual cues, pre-adolescents remain 'cognitive misers' (Derbaix & Pecheux 1999).

It is not until adolescence that children are able to focus on the information that is most relevant, and use information on attributes, in order to form preferences (Roedder John 2008). Nevertheless, children's developments in the affective realm enable them 'to form and hold stable and consistent attitudes' (Phelps & Hoy 1996). In applied research, these findings have found wide support. Affective measurement instruments, such as preferences or liking, are often favoured for measuring attitudes or intentions to consume (Gorn & Florsheim 1985; Phelps & Hoy 1996). However, studies have exclusively focused on positive affect. The persuasive potential of negative affective reactions elicited on a volitional basis has been disregarded when children are the targets.

Threat appeal effectiveness in relation to children

We base our expectations with regard to the effectiveness of threat appeals for children on two main elements. Our first argument rests on the process of persuasion that occurs mainly through the affective reactions elicited by the message. Although early research on PMT and among adults supported an exclusively cognitive mechanism, a recent stream of studies acknowledges the essential role of affective variables in the persuasion process (see Norman *et al.* 2005; Gallopel-Morvan 2006 for reviews). In AIDS prevention research, Umeh (2004) cast serious doubts on the notion that health decisions are necessarily based on an exclusively cognitive evaluation. The meta-analysis by Milne *et al.* (2000) reported medium correlations between fear and behavioural intention. Nevertheless, at this stage, one cannot rule out the likelihood that children activate cognitive processes. A study of the potential impact of appraisal appears relevant for this reason and also because cognitive processes may lead to message failure (Ripptoe & Rogers 1987). The counterproductive influence of elaboration has recently been identified in a guilt-eliciting advertising context, where scrutinising the information tends to diminish the influence of the emotion (Chang 2011). In threat appeals, adults may appraise the relevance of the ad's recommendation, decide that they will not comply with it and produce alternative solutions. However, this cause of failure has a low probability of occurrence with children. This is our second argument. The ongoing process of cognitive development in 8 to 12 year olds restricts their analytical and comparative capabilities in exposure situations (Roedder John *et al.* 1983; Roedder John & Whitney 1986). Spontaneous elaboration, or the use of cognitive 'coping skills', is unlikely for children watching advertisements (Derbaix & Brée 1997; Nairn & Fine 2008). Furthermore, 7 to 11 year olds only use information stored in their memory when a cue is offered for retrieval (Macklin 1994; Roedder John 1999). In sum, if not triggered, the probability of observing counter-argumentation is low, and this increases the likelihood that children will accept the recommendation. Consequently, tweens are unlikely to reject a credible message, and will probably comply with its recommendation.

Whether threat appeals are more effective than 'typical' advertising for the target should also be considered. The current overload of television advertisements has decreased the level of attention devoted to individual stimuli (Van Evra 1995), even though this is essential to the effectiveness of the advertisements (Milosavljevic & Cerf 2008). A communication promoting healthy food for children using typical appeals may not be

sufficiently striking to counterbalance the heavy advertising pressure from the junk food industry. The principal of cue overload states that 'cue effectiveness is inversely related to the number of items sharing a cue' (Hunt 1995, p. 110). Furthermore, the isolation effect postulates that the surprise induced by the differences between a cue and the preceding ones improves attention and memory, which in turn increases the effectiveness of the cue (Hunt 1995). Accessibility contributes to children's perception that a message is important and relevant, which are two determining factors in the likelihood that behaviours will follow exposure to advertisements (Van Evra 1995). As mentioned earlier, standing out and offering the distinctiveness that favours accessibility (and thus compliance) would require an extraordinary talent in the context of typical appeals. Furthermore, although humour may attract attention, Weinberger and Gulas (1992) conclude that humour 'does not offer an advantage over non-humour at increasing persuasion'. Gass and Seiter (2007) state that humour may impact minor decisions but not major ones. However, incongruence with the positive tone usually encountered in children's advertisements may enhance the advertisement's effectiveness. Consequently, beyond the mere effectiveness of threatening messages, we expect that the 'distinctiveness' of such messages due to their different emotional register will induce greater compliance with the recommendations of the messages compared with typical advertisements. Therefore, we hypothesise the following:

- H1:** Advertising effectiveness evaluated through children's consumption of healthy food will be higher for threatening advertisements than for 'typical' children advertisements.

Furthermore, we expect that the persuasion mechanisms of threat appeals will depend on the affective reactions elicited by the advertisements. As stressed earlier, the ability of advertisements to persuade children relies on the affective reactions elicited, supplanting existing beliefs or cognitions to shape the children's attitudes (Derbaix & Brée 1997; Pecheux *et al.* 2006). Furthermore, substantial evidence demonstrates that consumptions can be influenced by implicit affective associations elicited by advertising exposure, without mediation through cognition (Nairn & Fine 2008). 'Affect heuristics', or mental short-cuts that allow an individual to make judgements based on affective responses, are particularly common when mental resources are limited (Finucane *et al.* 2000); this is a characteristic of pre-adolescents (Roedder John 1999). We may assume that eliciting negative affective reactions on top of positive ones does not pervert the affective process. Although a negative mood may lead to a more in-depth processing of information (Armitage *et al.* 1999), sadness and anxiety (negative emotions) have been shown to influence decision-making by limiting people's abilities to process information (Raghunathan & Pham 1999).

We also expect that exposure to a threatening stimulus will increase the strength of the relationship between the elicited affective reactions and behaviour. Sonbonmatsu and Fazio (1990) argue that the more accessible a construct is, the more it will be relied upon. This is consistent with Fiske's accessibility-diagnostics heuristic (1980), which suggests that information can only be used to make a decision if the information is accessible.

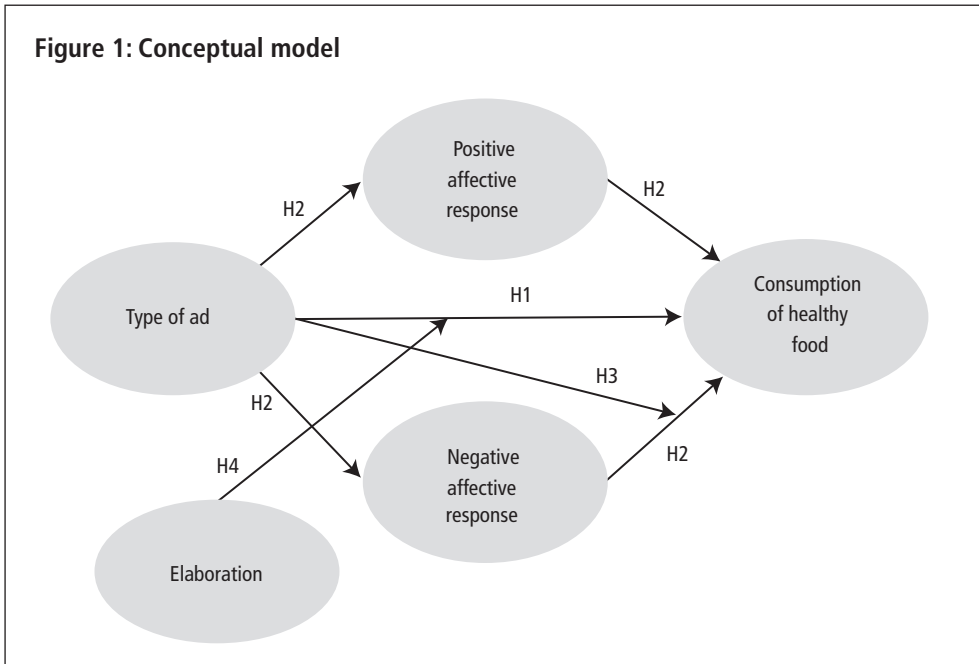
Accessibility depends on retrieval from memory or the vividness of the information presented. Fiske (1980) also predicts that when various pieces of information are available, the piece presenting the highest perceived accessibility will be the predominant cue in decision-making. We hypothesised previously that a threatening communication, consistent with the isolation effect and with distinctiveness, would gain more attention and accessibility in memory. Affective responses, children's main source of information after exposure to ads, will be more accessible after exposure to the threatening advertisement than after exposure to a 'typical' advertisement. We may expect that their influence on behaviour will be stronger. We therefore hypothesise the following:

- H2:** Affective response will mediate the relationship between the type of ad and the children's consumption of healthy food.
- H3:** The type of advertisements to which children are exposed moderates the relationship between negative affective responses and the consumption of healthy food. The strength of the relationship between negative affective responses and the consumption of healthy food will be higher for children exposed to threatening advertisements than for those exposed to typical advertisements.

From this perspective, encouraging elaboration on communication, an artificially created cognitive process according to advertising research with children (Brucks *et al.* 1988; Nairn & Fine 2008), may interfere with the natural flow of persuasion and decrease the effectiveness of a threat appeal. Considering tweens' cognitive development, it is not likely that they will provide spontaneous and personal alternative solutions. Nevertheless, denial of the threat could occur in an attempt at controlling the negative emotion ('fear control'), rather than compliance with the recommendation to alleviate the threat ('danger control') (Witte 1994). In our context, thinking extensively about the situation may lead children to assess the current severity of the threat and reject the imminent risk of becoming obese. It has been shown that temporal proximity of the negative consequences of a danger is essential to the threatening effect of the danger on young adolescents (Botvin *et al.* 1992). Although the target fears social rejection, tweens may realise that obesity only occurs after repeated inadequate behaviour. Therefore, they may deny the threat and decide not to comply with the recommendations. However, if affective reactions are a key driver of children's behaviours, children will opt for the 'will-make-me-feel-better' behaviour by consuming more healthy foods. We postulate the following:

- H4:** Effectiveness of threatening advertisement will be moderated by children's elaboration. Advertising effectiveness of threatening advertisements evaluated through children's consumption of healthy food will be higher under low elaboration than under high elaboration.

We depict the conceptual framework that includes all the hypotheses in Figure 1.



Research method

To test our hypotheses, a 2 (advertisement: threat and typical appeals) \times 2 (elaboration: low and high) between-subjects design experiment was conducted.

Participants

A total of 126 children attending two primary schools were involved in the complete data collection. The schools were selected based on their representativeness of the region's population in terms of socioeconomic background. To avoid any bias, children from all classes of both schools were assigned to the four conditions, and each class was equally represented in each experimental condition ($\chi^2(11) = 7.56$; $p = 0.75$). Parents were informed of the intervention and its objective, and their permission was required prior to the children's participation. We also requested parents not to discuss the issue before the intervention. Table 1 provides details on the sample.

Stimulus material

Two audio-visual advertisements were created for this experiment. This material appeared to be the most appropriate, because children's consumption of television remains substantial (Nairn & Fine 2008). The 'threat' ad depicts the social exclusion of an obese child that ends thanks to his consumption of fruits and vegetables. The 'typical' ad visually

Table 1: Sample description and assignment

	<i>n</i>
Gender	
Girls	61 (48.5%)
Boys	65 (51.5%)
Age	
7–9	60 (47.6%)
10–12	66 (52.4%)
Treatments	
Threat ad/low elaboration	37
Threat ad/high elaboration	30
Typical ad/low elaboration	30
Typical ad/high elaboration	29

enumerates ‘fun’ activities that pre-adolescents enjoy, and stresses how important the consumption of fruits and vegetables is for their practice.

Prior to the selection and production of the advertisements, five scenarios were pre-tested. Two focus groups, each with six pre-adolescents, were used to confirm the affective responses to the advertisements, the similarities in execution and the interpretations of the message. The threatening advertisement elicited negative affective reactions such as fear, disgust and sadness, responses that are consistent with the literature (Schoenbachler & Whittler 1996; Leshner *et al.* 2007). Only positive affective reactions were reported for the ‘typical’ advertisement. Furthermore, the executions appeared similar. Finally, the focus groups confirmed the children’s ability to understand the advertising message and the advertisement’s headline. Details regarding the pretest and the scenarios are available in Appendices 1 and 2 respectively.

Measurement instruments

The level of elaboration of half of the subjects was manipulated through the introductory question, ‘Tell me all that went through your mind while watching and after watching the programme’, as previously used with children (Brucks *et al.* 1988; Pecheux & Derbaix 2002b). Asking children – after exposure – to concentrate on their thoughts and to describe them should certainly be considered as a highly cognitive situation, given that children do not tend to elaborate spontaneously on ads (Brucks *et al.* 1988; Nairn & Fine 2008). Various arguments justify this procedure. First, while absorbed by the entertaining show that ads represent, children would not make use of information provided *before* the exposure (Brucks *et al.* 1988). It also corresponds to a more ‘natural’ situation, which increases the external validity of this research. If parents happen to ask their children what they think of the ads, this will most probably happen after the exposure, and is very unlikely before. Lastly, the specific wording seems to correspond to an appropriate

language for the target, and ensures that we do not create a mere measurement effect, which would occur if the question itself had provoked the response (Brucks *et al.* 1988).

In addition to the level of elaboration, we also measured the affective responses and the healthy food consumption. The Affective Reactions Elicited by the Advertisement (AREAd), encompassing positive emotions, such as amusement, joy, interest and contentment, and negative ones, including worry, disgust, sadness, fear and anger, were measured on the four-point Likert scale developed by Derbaix and Brée (1997). Children's selection from healthy and unhealthy food options measures advertising effectiveness. In our study, we counted the number of strawberries eaten per child under each condition during the course of the experiment. Chocolate toffees were added to ensure valid conclusions. In the absence of a tempting alternative, it is difficult to state that children's increased consumption of fruit is the result of a decision to eat healthier food rather than an eagerness to eat. Toffees and strawberries were selected for two reasons. First, they represent foods that are appreciated by the target (as evaluated prior to the experiment in an initial phase of the procedure; see below). Second, the fruit and toffee represent approximately the same portion size and volume on a plate, which is relevant because sizes and portions appear to influence quantities consumed (Orlet Fisher *et al.* 2003). An equal number of strawberries and toffees was presented on individual plates.

Procedure

Approximately one month before the experiment took place, initial data were collected from our sample. The purpose was to assess our respondents' attitudes towards the behavioural measures used in the experiment. These measurements ensured equal levels of preference for strawberries (and chocolate toffees) across the conditions. We randomly assigned children to one of the four experimental conditions after blocking on their attitude towards strawberries and toffees. Children's sensitivity to healthy food, identified as another probable influence on their consumption choices, was also measured for the purposes of this assignment. Through multiple-choice or open-ended questions developed with the help of a nutritionist and an educator, the pre-adolescents were asked what constituted a balanced meal, what foods they would ask their parents to buy for them at the supermarket, etc. Filler questions regarding the subjects' general knowledge and preferences in domains outside food were added to dilute the subjects' attention. The results of the assignment show that the four groups did not differ on those variables (Sensitivity to healthy food: $F = 1.22$, $df = 3$, $p = 0.30$; $A_{\text{strawberries}}: F = 2.05$, $df = 3$, $p = 0.11$; $A_{\text{chocolatetoffee}}: F = 0.47$, $df = 3$, $p = 0.70$). The cover story provided by the researchers explained that the experiment intended to learn about 8 to 12 year olds' interests and preferences.

The experiment was conducted in the subjects' schools. Participants were welcomed in groups with a maximum of four individuals in a room assigned to the study. The children sat in front of a screen while an animated background played to create a neutral mood. In the meantime, the cover story provided in the first phase of the research was repeated, and the procedure explained. After the exposure, children were asked to find the seat and individual table that had been prepared especially for them. We had arranged the seats

facing the wall to prevent inter-children communication. Identical plates of strawberries and toffees were made available on all of the tables. Children were explicitly but subtly invited to consume as much as they liked. However, they were told that no food could be taken out of the room.

Analysis and results

Structural equation modelling was used to test the hypotheses because it allows for the simultaneous testing of relationships between constructs. More precisely, the data were analysed using SmartPLS version 2.0.M3 (Ringle *et al.* 2005) in two stages: the measurement model and the structural model. SmartPLS is a structural equation modelling technique that is recommended when the model is complex, the sample size is quite small or assumptions of normality are not satisfied (Chin & Newsted 1999). In this research, the sample size is rather small.

Measurement model

First, we tested the measurement model by performing a validity and reliability analysis for each measure of the structural model. Table 2 shows the final scales. All of the item loadings were satisfactory, and the *t*-values were highly significant ($p < 0.0001$), except for two items of the negative affective responses scale. Nevertheless, the standard loading of these two items ('I was worried' and 'I felt bad') were over 0.65, which we considered acceptable. The composite reliabilities (CR) and coefficient alphas were over the recommended 0.7 for each construct (Fornell & Larcker 1981). The convergent validity was tested with the average variance extracted (AVE), and was higher than 0.5 for all the constructs. Discriminant validity was assessed through the variance extracted test (Fornell & Larcker 1981). Given that the square root of AVE of each latent variable was higher than the correlation between that latent variable and all the other latent variables, we consider that all variables achieved a good discriminant validity. The measures of the model are reliable and valid overall. Table 3 shows the descriptive statistics for each construct as well as the correlation between constructs. The 'Healthy Food Consumption' (HFC) has only one indicator (i.e. 'strawberries consumption') and is thus considered a formative measure. We included it in the table to show the correlation with the other constructs.

Manipulation check

The manipulation check verified that children in the high elaboration conditions demonstrated their elaboration. Children who did not write down comments about their thoughts were eliminated from the sample. We can consequently expect higher levels of elaboration in comparison with children who were not requested to reflect.

Additional analyses were conducted on the content of the responses to the introductory question. Two judges were appointed to ensure triangulation across researchers. Thoughts were classified according to their self-relevance (thoughts that implicate the respondent)

Table 2: Standard loadings, composite reliability and average variance extracted

Constructs and measured items	Standard loadings
Negative affective responses – NEGAREAD (Cronbach's alpha = 0.8145; CR = 0.8626; AVE = 0.5122)	
I was worried (<i>Je me suis senti(e) inquiet(e)</i>)	0.6609
I felt bad (<i>Je me suis senti(e) mal(e)</i>)	0.6558
I felt disgusted (<i>Je me suis senti(e) dégoûté(e)</i>)	0.7589
I felt angry (<i>Je me suis senti(e) fâché(e)</i>)	0.7211
I felt sad (<i>Je me suis senti(e) triste</i>)	0.7643
I was scared/afraid (<i>J'ai ressenti de la peur</i>)	0.7254
Positive affective responses – POSAREAD (Cronbach's alpha = 0.8128; CR = 0.8701; AVE = 0.6279)	
I felt entertained (<i>Je me suis senti(e) amusé(e)</i>)	0.7034
I felt joyful (<i>Je me suis senti(e) joyeux(se)</i>)	0.7670
I was interested (<i>Je me suis senti(e) intéressé(e)</i>)	0.7910
I felt content (<i>Je me suis senti(e) content(e)</i>)	0.8962

Table 3: Descriptive statistics and the latent variable correlation matrix – discriminant validity (n = 127)

	Mean	STD	HFC	NEGAREAD	POSAREAD
HFC	1.0238	1.2423	1	0	0
NEGAREAD	1.2052	0.4069	0.2328	0.7157	0.7924
POSAREAD	2.8939	0.7839	0.0376	-0.2342	0.7924

Note: Bold numbers on the diagonal show the square root of AVE.

or content-relevance (thoughts related to the content of the advertisement that do not involve the child). Agreement in classifying the thoughts was high (92%). The disagreements were resolved during a discussion between the raters. T-tests indicate that children who were exposed to the threatening advertisement and who were invited to elaborate produced more content-related thoughts than children who were exposed to the typical advertisement ($t = 2.99$; $p = 0.004$; $df = 57$). Furthermore, children who were exposed to the threatening advertisement produce marginally fewer self-relevant thoughts ($t = -1.57$; $p = 0.06$; $df = 51$). This suggests that, when forced to elaborate on an advertisement, children concentrate on different subjects depending on the type of appeal. Finally, it should be stressed that for thoughts classified as self-relevant under the threatening condition, counter-arguments were identified ('We have to eat 5 fruits and veg per day but from time to time, we can also indulge in candies', Guillaume, 11½ years old; 'We have to eat healthily but that also means a little fat', Laura, 11 years old). This may be perceived as

a denial of the imminence of the threat. Under the typical advertisement condition, no counter-arguments were identified.

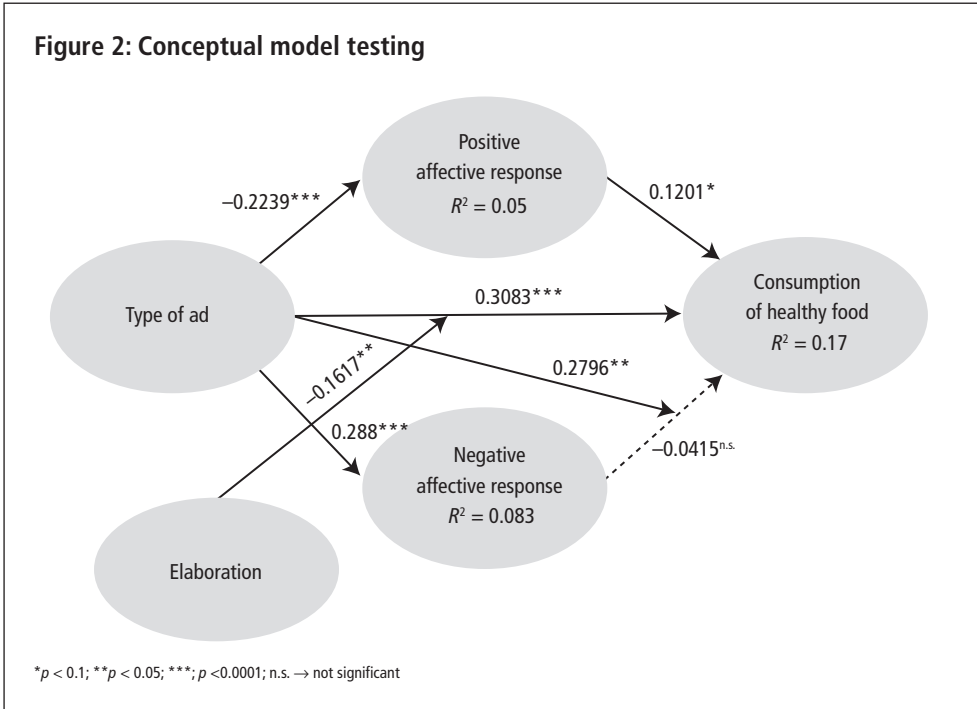
Hypotheses testing

Our conceptual model includes several mediations and moderations. We first test the mediation effects of positive and negative affective responses in the ‘Type of ad’ – HFC (consumption of healthy food) relationship. Second, we test the moderations of ‘Type of ad’ and ‘elaboration’. In order to test the mediating effects, we used the Baron and Kenny (1986) procedure as well as Sobel’s (1982) z test adapted by Preacher and Hayes (2008). Table 4 presents the path coefficients and their statistical significance (obtained by using the bootstrapping resampling technique). These results allow us to test H1 and H2 (according to which threatening advertisements (‘Type of ad’ = 1) increase healthy food consumption, and affective responses mediate the relationship between ‘Type of ad’ and ‘healthy food consumption’). H1 is supported. Indeed, threatening ads have a direct, positive and significant effect on healthy food consumption ($\beta = 0.2365$; $p = 0.0026$). In addition to this direct effect, threatening ads increase children’s consumption of healthy food through two routes. On the one hand, threatening ads decrease positive affective response ($\beta = -0.2239$; $p = 0.0020$), which in turn increases the consumption of healthy food ($\beta = 0.1365$; $p = 0.0449$). The mediating effect of positive affective response is marginally significant ($z = 1.714$; $p = 0.0853$) and the total effect is positive ($a * b + c = 0.1963$). On the other hand, threatening ads raise children’s negative affective responses ($\beta = 0.288$; $p < 0.0001$) which intensifies their consumption of healthy food ($\beta = 0.1968$; $p = 0.0192$). The mediation effect of negative affective response is significant ($z = 2.1886$; $p = 0.0291$), and the total effect is positive as well ($a * b + c = 0.2836$). We have two complementary mediations (Zhao *et al.* 2010), in which negative affective responses play a more important role than positive ones. Consequently, H2 is supported.

We then test moderations. Figure 2 shows path coefficients as well as the R^2 values which provide an indication of the predictive ability of independent variables. Table 5 presents the path coefficients and their statistical significance obtained by using the bootstrapping resampling technique. H3 postulates that ‘Type of ad’ moderates the ‘negative affective responses – consumption of healthy food’ link. Our results demonstrate that the

Table 4: Mediation testing

Relationships	<i>B</i> s	<i>T</i>	<i>P</i>
Type of AD → POSAREAD	-0.2239	2.8878	0.0020
Type of AD → NEGAREAD	0.2880	5.6557	0.0000
Type of AD → HFC	0.2362	2.8101	0.0026
NEGAREAD → HFC	0.1968	2.0757	0.0192
POSAREAD → HFC	0.1365	1.6999	0.0449



impact of negative affective responses on ad effectiveness is higher for children exposed to threatening ads than for those exposed to typical ads ($\beta = 0.2796$; $p = 0.0279$). H3 is thus confirmed. According to H4, children’s elaboration moderates the effectiveness of threatening ads. Examination of the model results (Table 5) indicates that when children elaborate (‘elaboration’ = 1), threatening ads have a lower impact on healthy food consumption ($\beta = -0.1617$; $p = 0.0147$). H4 is thus supported.

Table 5: Moderating testing

Relationships	Bs	T	P
Type of AD → POSAREAD	-0.2239	2.99	0.0015
Type of AD → NEGAREAD	0.2880	5.8051	0.0000
Type of AD → HFC	0.3083	3.0981	0.0010
NEGAREAD → HFC	-0.0415	0.3837	0.3507
POSAREAD → HFC	0.1201	1.622	0.0527
Elaboration → HFC	-0.0654	1.062	0.1444
Elaboration * Type of ad → HFC	-0.1617	2.1853	0.0147
NEGAREAD * Type of ad → HFC	0.2796	1.9172	0.0279

Discussion, limitations and further research

This study provides behavioural evidence of the effectiveness of threat appeals, demonstrating that these appeals influence children's healthy consumption (strawberries) more significantly than typical appeals (H1).

In addition to these practical findings, a theoretical contribution is proposed. This research supports the idea that threat appeals persuade pre-adolescents through an affective process (H2). In contrast to the findings on older subjects, increasing children's levels of cognitive effort does not enhance the effectiveness of the appeal. On the contrary, elaboration appears to influence the effectiveness of the advertisement negatively. Elaboration seems to lead to 'fear control' rather than to 'danger control', which is counterproductive (Witte 1994). In concrete terms, this suggests that children who are left alone to deal with the affective reactions elicited during and after exposure to a threat appeal are more likely to comply with the healthy recommendation embedded in the advertisement (H4). Allowing children to watch television alone, a practice that is often criticised, may have a positive impact in this context.

This research also offers additional original conclusions. First, it is worth noting that 'fear' is not the most prevalent negative affective response to the threatening advertisement (mean = 1.13). Threats seem to trigger a more complex range of emotions such as 'sadness' (mean = 1.48), 'worry' (mean = 1.45) and 'disgust' (mean = 1.33) than a simple phobic reaction, consistent with previous research on social threats (Schoenbachler & Whittler 1996) and with recent studies emphasising the importance of disgust when low levels of fear are elicited (Leshner *et al.* 2007). It is plausible that for 'tweens', 'fear' is the affective response to a more concrete threat (such as of monsters, of war, or of self-injury) than a threat of social exclusion. Investigating fears related to acts performed in public, Field *et al.* (2003) referred to fear experiences using 'embarrassing' or 'nerve-wracking'. In all instances, although the levels of the negative affective responses remained low (max = 1.48 on a 1- to 4-point scale) their role appears to be essential (H3). It suggests that eliciting high levels of negative affect is not essential to effectiveness, a conclusion of much value when one considers managerial contributions. Furthermore, negative affective responses are, most probably, one of the causes of the distinctiveness of the appeal. They seem to increase the attention to and recall of the content of the advertisement, and contribute to greater accessibility in decision-making. These assumptions nevertheless call for further studies.

Although these findings are encouraging, limitations to this research should be acknowledged. First, we stress that our conclusions rest on the assumption that children who are not asked to elaborate on an ad will produce fewer thoughts than children who are required to do so. While this seems reasonable, the methodology used to collect our data did not allow us to measure the level of thoughts in the 'low elaboration' condition and to compare it with those in the 'high elaboration'. Asking questions related to thought production to children would probably bias the response. It is also possible that the type of thoughts produced was induced by the school context itself. One can safely assume that the 'learning context' conditions the way children reflect on an issue.

Second, we must note that these results were achieved under somewhat forced exposure. Consequently, the children's level of attention to the stimuli may have been heightened, regardless of the advertising condition. One might expect that in a natural exposure situation, the level of attention that children would devote to 'typical' advertising compared to a threatening message would be lower (Field 2006). Consequently, any bias that may have appeared due to forced exposure would be in favour of the 'typical' advertisement. Nevertheless, it is not clear to what extent this 'attentional bias' would remain after repeated viewings. To the same extent, distinctiveness may not endure if the usage of threat appeals is generalised. Further research on these issues should examine the long-term potential of threat appeals with regard to children.

Third, children's Body Mass Index was not integrated as a moderating variable in our analyses. Although it may be assumed that random assignment ensured equal means across conditions, this must be acknowledged as a limitation to our research.

Fourth, the various components of the PMT model were not studied *per se* in this research. At this early stage, studying the model beyond the effectiveness of the appeal and the affective versus cognitive process seemed overly ambitious, because a necessary condition for research success in our target is parsimony. Consequently, variables such as Bandura's 'self-efficacy' (1977), or the perceived efficacy of our recommendation, were not considered. Furthermore, variables usually integrated in advertising research (Aad and Ab) were not integrated, but this calls for further research. Research on other potentially moderating variables, such as personal characteristics (personality traits, socioeconomic factors, etc.) or the credibility of the source, would also provide valuable insights into the study of the persuasion process.

Lastly, it appears relevant for marketing theory and practice to carry out further study of the various types of threats targeted at children. Depicting the social dangers of obesity in this research rested on two elements: the findings of previous research using slightly older targets (Schoenbachler & Whittler 1996; Pechmann *et al.* 2003), and what children perceive as the most immediate consequence of being overweight (Harker *et al.* 2007). However, depicting other types of risks aside from social ones (e.g. health, sporting achievements) may be as effective with this specific age group. For instance, physical threats have been shown to produce the greatest emotional responses among 14 to 16 year olds (Dickinson & Holmes 2008), and may give rise to less ethically disputable issues. From this perspective, the study of other negative emotions could be relevant. Chang (2011) demonstrated that guilt appeals were effective with products fulfilling functional needs. If one agrees that children see fruit and vegetables as 'practical' products, as opposed to hedonistic ones, this may also be an interesting path to investigate further.

In all instances, the ethical dimensions of threat appeals aimed at children deserve careful evaluation. Nevertheless, we argue that some elements are in favour of this option. First, stressing the negative consequences of acts such as crossing the street without looking, or talking to strangers, appears to be common practice and to be a contributing part of children's development (Bacus 2005). Second, a teleological approach to the ethics of marketing seems to support the use of threat appeals when comparing its positive and negative consequences, and this is also true of obesity. Obesity is associated with health problems

such as diabetes, cardiovascular problems and asthma, and with psychological disorders linked to self-esteem (Ebbeling *et al.* 2002) or discrimination (Neumark-Sztainer *et al.* 1999). In comparison, our advertisements influenced consumption without provoking a strong sense of rejection, as demonstrated by the mild levels of negative affective reactions reported. Nevertheless, the deontological approach and its 'do not harm' basis cannot be ruled out at this stage. Although it could be argued that current creative techniques in professional advertising agencies may enable the depiction of threats with sufficient subtlety, further studies are certainly required to support the managerial implications proposed by this research.

Finally, however effective, advertising campaigns based on threat appeals will not eradicate the obesity epidemic on their own. We believe that education and upstream actions such as affordable fresh fruit and vegetables, and sport infrastructures available to all, should be combined with communication campaigns. In the context of smoking prevention, school programmes were increasingly effective when supported by advertising (see Pechmann 1997 for her review). In conclusion, we would like to emphasise that our encouraging findings will be of greatest use in the fight against the obesity epidemic if the strengths of a wide range of methods are combined.

Appendix 1: Pretest of the advertising scenarios and the selection of scenarios

Pretest

Prior to the production of the audio-visual advertisements, five scenarios were pretested by means of PowerPoint mood boards providing non-static images and sound. Three scenarios used threatening themes (a threat of social exclusion, a threat to the ability to participate in physical activities with other children and a threat related to aesthetic issues), and two other scenarios relied on action with humour, the most commonly used methods according to Roberts and Pettigrew (2007). All competing scenarios (threatening vs 'typical') had as many common points in their execution as possible. The prevalence of executional features in persuasion has been demonstrated in advertising research with children (Derbaix & Brée 1997; Pecheux & Derbaix 2002a), and their similarity is essential in avoiding effectiveness misattribution. Music represented the main executional difference across themes. The music had to support the scenario itself; consequently, identical music could not be used for each scenario. A slow tune was selected for the negative affective state, while a dynamic tune was chosen for the positive affective state.

Two focus groups were set up, the first with six 7 to 9 year olds and the second with six 10 to 12 year olds. In order to evaluate children's affective responses to the ad, semi-structured interview guides were used with a set of open-ended questions. Starting from what the children liked or disliked in the ad, questions such as 'How did you feel while watching?', 'What made you feel that way?', 'Have you ever felt that before?', 'In what kind of situation?', and 'What do you think your classmates would feel?' were asked. Children were also requested to compare the various ads in terms of the emotions elicited and their

intensity ('Which one makes you the saddest, the most disgusted ... and why?', or 'Can you tell me which is the worst according to you?'). The children consequently evoked their affective responses to the advertisement, discussed the similarities and dissimilarities in the scenarios and execution of the threatening and non-threatening advertisements, classified the advertisements according to the threatening or non-threatening theme and confirmed their understanding of the message. Based on discussions with the younger and the older age groups, two scenarios were selected based on the children's ability to elicit the expected reactions. The threatening advertisement elicited negative affective reactions, consistent with the literature (Schoenbachler & Whittler 1996; Leshner *et al.* 2007). Only positive affective reactions were reported for the 'typical' advertisement. The executions could be considered similar. Music did not appear to be the source of the negative affective reactions, although it supported them.

Appendix 2: Advertisement scenarios

Threat appeal

The action takes place in a school, in the hallway that leads to the children's classroom, where the children's coat racks are located. In this school, as in many schools, each child has drawn an animal that represents him or her and the drawings have been placed, along with the children's names, above their personal pegs. The music in the background is a slow tune played on the piano. The camera moves along the racks. All the coats are gathered with the exception of one, which is excluded from the group and isolated at the end of the coat rack. The drawing on this peg is of a big, fat cow. A voice is heard: 'We are all scared of being called nasty names. However, this can easily be avoided just by picking the right food. You, too, think about it – and eat fruits and veggies!' At the same time, a child's hand picks up the isolated coat and puts it back with the others. The child is not fully visible and is only seen from behind. His age is not specified, and he never appears in full-length view. The old drawing is replaced by one of a smart cow. The final screen appears. It is fully black for one second. Then fruits and vegetables represented as cartoon characters appear. The text '*Les fruits et les légumes, ça compte pas pour des prunes*' (an old saying and a play on words that stresses that fruits and vegetables are essential) follows, written in white. At the same time, the voices of off-screen children repeat the text.

Typical appeal

The action takes place in a school, in the hallway that leads to the children's classroom, where the children's coat racks are located. Sports gear (tennis rackets, snorkelling gear, ropes, etc.) are hanging from the coat rack. The music in the background is a dynamic tune on the piano. A child comes running into the hallway, picks up the tennis racket and leaves a bicycle helmet. The child is not fully visible, and he is only seen from behind. His age is not specified, and he never appears in full-length view. A voice is now heard: 'Life can be pretty demanding. Fruits and vegetables help you through all your activities.'

Think about it – and eat fruits and veggies!’ The final screen appears. It is fully black for one second. Then fruits and vegetables represented as cartoon characters appear. The text ‘Les fruits et les légumes, ça compte pas pour des prunes’ (an old saying and a play on words that stresses that fruits and vegetables are essential) follows, written in white. At the same time, the voices of off-screen children repeat the text.

Acknowledgements

The authors are grateful to Professors Claude Pecheux and Patrick De Pelsmacker for their much appreciated guidance. They would also like to thank the reviewers for their truly valuable comments.

References

- Ambler, T. (2006) Does the UK promotion of food and drink to children contribute to their obesity? *International Journal of Advertising*, 25(2), 137–156.
- Armitage, C.J., Conner, M. & Norman, P. (1999) Differential effects of mood on information processing: evidence from the theories of reasoned action and planned behaviour. *European Journal of Social Psychology*, 29(4), 419–433.
- Bacus, A. (2005) *Même pas peur!* Paris: Marabout.
- Bandura, A. (1977) Self-efficacy: towards a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215.
- Bandyopadhyay, S., Kindra, G. & Sharp, L. (2001) Is television advertising good for children? Areas of concerns and policy implications. *International Journal of Advertising*, 20(1), 89–116.
- Baron, R.M. & Kenny, D.A. (1986) The moderator–mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Botvin, G.J., Dusenbury, L., Baker, E., James-Ortiz, S., Botvin, E.M. & Kerner, J. (1992) Smoking prevention among minority youth: assessing effects on outcome and mediating variables. *Health Psychology*, 11(5), 290–299.
- Brucks, M., Armstrong, G.M. & Goldberg, M.E. (1988) Children’s use of cognitive defenses against television advertising: a cognitive response approach. *Journal of Consumer Research*, 14(4), 471–482.
- Burnett, J.J. & Oliver, R.L. (1979) Fear appeal effects in the field: a segmentation approach. *Journal of Marketing Research*, 26 (May), 181–190.
- Chang, C.-T. (2011) Guilt appeals in cause-related marketing. *International Journal of Advertising*, 30(4), 587–616.
- Chin, W.W. & Newsted, P.R. (1999) Structural equation modeling analysis with small samples using partial least squares, in R. Hoyle (ed.) *Statistical Strategies for Small Sample Research*. Thousand Oaks, CA: Sage Publications, 307–341.
- Derbaix, C. & Brée, J. (1997) The impact of children’s affective reactions elicited by commercials on attitudes toward the advertisement and the brand. *International Journal of Research in Marketing*, 14, 207–229.
- Derbaix, C. & Pecheux, C. (1999) Mood and children: proposition of a measurement scale. *Journal of Economic Psychology*, 20, 571–591.
- Dickinson, S. & Holmes, M. (2008) Understanding the emotional and coping responses of adolescent individuals exposed to threat appeals. *International Journal of Advertising*, 27(2), 251–278.

- Doak, C., Heitmann, B.L., Summerbell, C. & Lissner, L. (2009) Prevention of childhood obesity – what type of evidence should we consider relevant? *Obesity Reviews*, 10, 350–356.
- Donovan, R. (1991) Public health advertising: execution guidelines for health promotion professionals. *Health Promotion Journal of Australia*, 1, 40–45.
- Donovan, R. & Henley, N. (2003) *Social Marketing, Principles and Practice*. Melbourne: IP Communications.
- Ebbeling, C.B., Pawlak, D.B. & Ludwig, D.S. (2002) Childhood obesity: public-health crisis, common sense cure. *The Lancet*, 360(9331), 473–482.
- European Commission (2007) White paper on nutrition: Commission proposes EU wide efforts to tackle the obesity epidemic. Available online at: http://ec.europa.eu/dgs/health_consumer/index_en.htm (accessed 28 May 2008).
- Field, A.P. (2006) Watch out for the beast: fear information and attentional bias in children. *Journal of Clinical Child and Adolescent Psychology*, 35(3), 431–439.
- Field, A.P., Hamilton, S.J., Knowles, K.A. & Plews, E.L. (2003) Fear information and social phobic beliefs in children: a prospective paradigm and preliminary results. *Behaviour Research and Therapy*, 41, 113–123.
- Finucane, M.L., Alhakami, A., Slovic, P. & Johnson, S.M. (2000) The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making*, 13, 1–17.
- Fiske, S.T. (1980) Attention and weight in person perception: the impact of negative and extreme behavior. *Journal of Personality and Social Psychology*, 38(6), 889–906.
- Fornell, C. & Larcker, D.F. (1981) Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Freeman, D. & Brucks, M. (2002) Drugs, alcohol, and tobacco use prevention efforts. Benefits and challenges of targeting young children, in J.R. Flemming Hansen, A. Martensen & B. Tufte (eds) *Children: Consumption, Advertising and Media* (1st edn). Copenhagen: Copenhagen Business School Press, 243–252.
- Gallopel-Morvan, K. (2006) L'utilisation de la peur dans un contexte de marketing social: état de l'art, limites et voies de recherche. *Recherche et Applications en Marketing*, 21(4), 41–60.
- Gass, R.H. & Seiter, J.S. (2007) *Persuasion, Social Influence, and Compliance Gaining*. Boston: Pearson Education as Allyn & Bacon.
- Goldberg, M.E. & Gunasti, K. (2006) Creating an environment in which youths are encouraged to eat a healthier diet. *Journal of Public Policy and Marketing*, 26(2), 162–181.
- Gorn, G.J. & Florsheim, R. (1985) The effects of commercials for adult products on children. *Journal of Consumer Research*, 11(4), 962–967.
- Harker, D., Harker, M. & Burns, R. (2007) Tackling obesity: developing a research agenda for advertising researchers. *Journal of Current Issues & Research in Advertising*, 29(2), 39–51.
- Hunt, R. (1995) The subtlety of distinctiveness: what von Restorff really did. *Psychonomic Bulletin & Review*, 2(1), 105–112.
- Kline, S. (2010) Children as 'competent' consumers, in D. Marshall (ed.) *Understanding Children as Consumers*. London: Sage Publications Ltd, 239–257.
- Leshner, G., Vultee, F. & Bolls, P. (2007). When a fear appeal isn't a fear appeal: the effects of graphic antitobacco messages. Paper presented at the Proceedings of the Annual Meeting of the International Communication Association, 1.
- Macklin, C.M. (1994) The effects of an advertising retrieval cue on young children's memory and brand evaluations. *Psychology and Marketing*, 11(3), 291–311.
- Milne, S., Sheeran, P. & Orbell, S. (2000) Protection an intervention in health-related behavior: a meta-analytic review of protection motivation theory. *Journal of Applied Social Psychology*, 30(1), 106–143.
- Milosavljevic, M. & Cerf, M. (2008) First attention then intention: insights from computational neuroscience of vision. *International Journal of Advertising*, 27(3), 381–398.

- Nairn, A.C. & Fine, C. (2008) Who's messing up with my mind? The implication of dual-process models for the ethics of advertising to children. *International Journal of Advertising*, 27(3), 447–470.
- Neumark-Sztainer, D., Story, M. & Harris, T. (1999) Beliefs and attitudes about obesity among teachers and school health care providers working with adolescents. *Journal of Nutrition Education*, 3(1), 3–9.
- Norman, P., Boer, H. & Seydel, E.R. (2005) Protection motivation theory, in M. Conner & P. Norman (eds) *Predicting Health Behaviour* (2nd edn). Maidenhead: Open University Press, 81–126.
- O Cheng, T. (2004) Obesity in Chinese children. *Journal of the Royal Society of Medicine*, 97(5), 254–254.
- Ogden, C.L., Carroll, M.D., Curtin, L.R., Lamn, M.M. & Flegal, K.M. (2010) Prevalence of high body mass index in US children and adolescents 2007–2008. *Journal of the American Medical Association*, 303(3), 242–249.
- Orlet Fisher, J., Rolls, B.J. & Birch, L.L. (2003) Children's bite size and intake of an entrée are greater with large portions than with age-appropriate or self-selected portions. *American Journal of Clinical Nutrition*, 77(5), 1164–1170.
- Pecheux, C. & Derbaix, C. (2002a) Children's reactions to advertising communication: multiple methods, moderating variables and constructs validity issues. *Advances in Consumer Research*, 29, 531–538.
- Pecheux, C. & Derbaix, C. (2002b) L'attitude de l'enfant envers une nouvelle marque: de la nécessité d'une phase de fixation? *Recherche et Applications en Marketing*, 17(3), 63–79.
- Pecheux, C., Derbaix, C. & Poncin, I. (2006) The control of commercials targeting children: an experiment to investigate context effects. *European Advances in Consumer Research*, 7, 1–9.
- Pechmann, C. (1997) Does antismoking advertising combat underage smoking? A review of past practices and research, in M.E. Goldberg, M. Fishbein & S.E. Middlestadt (eds) *Social Marketing, Theoretical and Practical Perspectives*. Mahwah: Lawrence Erlbaum Associates, Inc, 189–229.
- Pechmann, C., Zhao, G., Goldberg, M.E. & Reibling, E.T. (2003) What to convey in antismoking advertisements for adolescents: the use of Protection Motivation Theory to identify effective message themes. *Journal of Marketing*, 67(April), 1–18.
- Peracchio, L.A. & Luna, D. (1998) The development of an advertising campaign to discourage smoking initiation among children and youth. *Journal of Advertising*, 27(3), 49–56.
- Phelps, J.E. & Hoy, M.G. (1996) The Aad-Ab-PI relationship in children: the impact of brand familiarity and measurement timing. *Psychology & Marketing*, 13(1), 77–106.
- Piaget, J. (1981). *Intelligence and affectivity: their relationship during child development*. Palo Alto, CA: Annual Reviews Monograph.
- Preacher, K.J. & Hayes, A.F. (2008) Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 870–891.
- Raghunathan, R. & Pham, M.T. (1999) All negative moods are not equal: motivational influences of anxiety and sadness on decision making. *Organizational Behavior and Human Decision Processes*, 79(1), 56–77.
- Ringle, C.M., Wende, S. & Will, A. (2005) *SmartPLS 2.0*. Hamburg, Germany: University of Hamburg.
- Ripptoe, P.A. & Rogers, R.W. (1987) Effects of components of Protection Motivation Theory on adaptive and maladaptive coping with a health threat. *Journal of Personality and Social Psychology*, 5(March), 596–604.
- Roberts, M. & Pettigrew, S. (2007) A thematic content analysis of children's food advertising. *International Journal of Advertising*, 26(3), 357–367.

- Roedder John, D. (2008) Stages of consumer socialization: the development of consumer knowledge, skills, and values from childhood to adolescence, in C.P. Haugtvedt, P.M. Herr & F.R. Kardes (eds) *Handbook of Consumer Psychology*. New York: Taylor & Francis Group, LLC, 221–246.
- Roedder John, D.L. (1999) Consumer socialization of children: a retrospective look at twenty-five years of research. *Journal of Consumer Research*, 26(3), 183–213.
- Roedder John, D.L. & Cole, C.A. (1986) Age differences in information processing: understanding deficits in young and elderly consumers. *Journal of Consumer Research*, 13(3), 297–315.
- Roedder John, D.L. & Whitney, J.C. (1986) The development of consumer knowledge in children: a cognitive structure approach. *Journal of Consumer Research*, 12(March), 406–416.
- Roedder John, D.L., Sternthal, B. & Calder, B.J. (1983) Attitude-behavior consistency in children's responses to television advertising. *Journal of Marketing Research*, 20, 337–349.
- Rogers, R.W. (1975) A protection motivation theory of fear appeals and attitude change. *Journal of Psychology*, 91(September), 93–114.
- Rozendaal, E., Buijzen, M. & Valkenburg, P. (2011) Children's understanding of advertisers' persuasive tactics. *International Journal of Advertising*, 30(2), 329–350.
- Sanbonmatsu, D.M. & Fazio, R.H. (1990) The role of attitudes in memory-based decision making. *Journal of Personality and Social Psychology*, 59, 614–622.
- Schoenbachler, D.D. & Whittler, T.E. (1996) Adolescent processing of social and physical threat communications. *Journal of Advertising*, 25(4), 37–54.
- Sobel, M.E. (1982) Asymptotic intervals for indirect effects in structural equations models, in S. Leinhardt (ed.) *Sociological Methodology*. San Francisco: Jossey-Bass, 290–312.
- Stice, E., Shaw, H. & Marti, N.C. (2006) A meta-analytic review of obesity prevention programs for children and adolescents: the skinny on interventions that work. *Psychological Bulletin*, 132(5), 667–691.
- Umeh, K. (2004) Cognitive appraisals, maladaptive coping, and past behaviour in protection motivation. *Psychology and Health*, 19(6), 719–735.
- Van Evra, J.P. (1995) Advertising's impact on children as a function of viewing purpose. *Psychology and Marketing*, 12(5), 423–432.
- Weinberger, M.G. & Gulas, C.S. (1992) The impact of humor in advertising: a review. *Journal of Advertising*, 21(4), 35–59.
- WHO (2010) Set of recommendations on the marketing of foods and non-alcoholic beverages to children. Geneva: World Health Organization.
- Wilcox, G.B., Kamal, S. & Gangadharbatla, H. (2009) Soft drink advertising and consumption in the United States 1984–2007. *International Journal of Advertising*, 28(2), 351–367.
- Witte, K. (1994) Fear control and danger control: a test of the Extended Parallel Process Model (E.P.P.M.). *Communication Monographs*, 61(2), 113–134.
- Witte, K. & Allen, M. (2000) A meta-analysis of fear appeals: implications for effective public health campaigns. *Health Education & Behavior*, 27(5), 591–615.
- Zhao, X., Lynch, J.G.J. & Chen, Q. (2010) Reconsidering Baron and Kenny: myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197–206.

About the authors

Karine M. Charry (PhD) is an Assistant Professor at the Department of Marketing and Negotiation at IÉSEG School of Management, Lille/Paris, France (LEM-CNRS 8179), Catholic University of Lille. Her research interests include advertising, persuasion processes, consumer behaviour – and namely children as consumers, social marketing and

ethics. Her ten years of experience in marketing departments of various companies and sectors in B-to-B and B-to-C contributes to the managerial contributions of her research published in various academic journals and books.

Nathalie T.M. Demoulin (PhD) is Associate Professor of Marketing at the Department of Marketing and Negotiation at IÉSEG School of Management, Lille/Paris, France (LEM-CNRS 8179), Catholic University of Lille. She is also head of the Marketing track. Her primary research interests are the marketing manager's decision making process and the impact of marketing decision support systems on managers. She currently conducts research linked to customers' loyalty, waiting time and sensorial marketing in service and retailing sectors. She published in international and French peer-reviewed journals such as *Decision Support Systems*, *Journal of Retailing*, *Journal of Retailing and Consumer Services*, *Managing Service Quality* and *Systèmes d'information et management*.

Address correspondence to: Karine Marjorie Charry, IÉSEG School of Management (LEM-CNRS), Marketing and Negotiation Department, 3, rue de la Digue, F-59800 France.

Email: k.charry@ieseg.fr

Copyright of International Journal of Advertising is the property of Warc LTD and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.