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Originally published in [Public policy research](#), 13 (1). pp. 54-61 © 2006 Blackwell Publishing.

You may cite this version as:

Livingstone, Sonia (2006). Does TV advertising make children fat : what the evidence tells us [online]. London: LSE Research Online.

Available at: <http://eprints.lse.ac.uk/1026>

Available in LSE Research Online: May 2007

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Does TV advertising make children fat?

What the evidence tells us

Sonia Livingstone

In: **Public Policy Research**, 13(1), 54-61

Rising obesity among children

There is growing public concern over rising levels of obesity among children, in the UK and many other countries in the developed world, as World Health Organisation reports have warned (as illustrated by 2003). The Royal College of Physicians reports that obesity has doubled among two to four year olds between 1989 and 1998, and trebled among six to fifteen year olds between 1990 and 2002. Similarly, in the USA, obesity among six to nineteen year olds has trebled over the past four decades, to 16 per cent in 1999-2002, while the incidence of type 2 diabetes has doubled in the past decade, with notable increases also in the risk of heart disease, stroke, circulatory problems, some cancers, osteoporosis and blindness.

The evidence of rising obesity, it seems, is beyond question. The explanation is less clear. The USA's Institute of Medicine's (IOM) Committee on Food Marketing and the Diets of Children and Youth observed in their major report to Congress (2005), children's diets *"result from the interplay of many factors... all of which, apart from genetic predispositions, have undergone significant transformations over the past three decades"*. In other words, researchers are generally agreed that multiple factors account for childhood obesity, including individual, social, environmental and cultural factors (Story, Neumark-Sztainer, & French, 2002). These factors are, for the most part, subject to change, and many of them interact with each other in complex ways not yet well understood.

One consequence is that policy decisions regarding intervention are highly contested, for multiple stakeholders, with competing interests, are involved. It is in this context that this essay focuses on just one putative explanation for childhood obesity, namely food promotion, particularly television advertising of foods high in fat, salt or sugar. It asks one key question: is the evidence base linking advertising to children's health sufficient to guide policy decisions?

Why blame television advertising?

All agree that the food industry is a major player in the advertising market. The total UK advertising spending per annum in the categories of food, soft drinks and chain restaurants is £743 million, with £522 million spent on television advertising and £32 million spent in children's airtime (Ofcom, 2004). In the USA, figures are much greater: for food and beverage marketing, \$11 billion was spent on advertising in 2004, including \$5 billion on television advertising, in addition to the larger but rarely calculated amounts spent on other marketing investments (product placement, character licensing, in-school activities, advergames and so on).

Consequently, considerable research efforts have been devoted to the hypothesised causal relation between food promotion and children's food preferences, diet and health. Systematic and substantial reviews of the best quality empirical studies argue that television advertising, the subject of most research, contributes to the unhealthy food preferences, poor diet and, consequently, growing obesity among children in Western societies. Thus, in the UK, Hastings et al's (2003) recent systematic review for the Food Standards Agency concluded that *'Food promotion is having an effect, particularly on children's preferences, purchase behaviour and consumption. This effect is independent of other factors and operates at both a brand and category level'*. Noting that most advertising to children is for products high in fat, salt and sugar, this influence is, they conclude further, harmful to children's health. The USA's Institute of Medicine (2005) report concluded, more strongly still, that *"among many other factors, food and beverage marketing influences the preferences and purchase requests of children, influences consumption at least in the short term, is a likely contributor to less healthful diets, and may contribute to negative diet-related health outcomes and risks among children and youth"*.

Not everyone agrees with these conclusions, and there are some significant dissenting voices, on various grounds, from industry, public policy makers and the academy (as reviewed in Livingstone, 2005). Nonetheless, as the evidence for the harmful effects of food advertising on children's health accumulates across Europe, North America and elsewhere, there is a growing consensus that the evidence base is sufficient to guide policy, and that it is time some tough policy decisions were taken.

From evidence to policy

For many, the link from evidence to policy is clear. As the World Health Organisation urges: *"Food and beverage advertisements should not exploit children's inexperience or credulity. Messages that encourage unhealthy dietary practices or physical inactivity should be discouraged, and positive healthy messages encouraged"* (2003). The British Medical Association, responding to the Government's White Paper, *Choosing Health: Making Healthier Choices easier* (November 2004), has recommended an outright ban on advertising foods to children in the UK. This goes a crucial step beyond the White Paper, which suggested a voluntary period of modification of advertising foods to children, giving food advertisers until 2007 before reconsidering the question of a ban. The Office of Communications (Ofcom) is currently consulting on the degree to which food advertising to children should be restricted, noting that this has direct costs for broadcasters in terms of revenues available for children's programming. In the USA, the Institute of Medicine report to Congress recommended that, *"if voluntary efforts related to advertising during children's television programming are unsuccessful in shifting the emphasis away from high-calorie and low-nutrient foods and beverages to the advertising of healthful foods and beverages, Congress should engage legislation mandating the shift on both broadcast and cable television"*. In some countries (Sweden, most notably), such a ban is already in force.

A ban on advertising foods high in fat, sugar and salt to children is not the only policy under consideration, particularly as the evidence is far from clear that bans are effective

in altering children's diets (this is partly because few countries have implemented a truly effective ban on food advertising and this has impeded evaluation research). The Institute of Medicine recommends numerous parallel strategies, including calling for marketing resources to promote healthy diets, improving food labelling systems, and developing explicit industry self-regulatory guidelines for new forms of marketing communications. Research and policy advisors in the UK and elsewhere have also proposed media literacy programmes to enhance children's critical analysis of marketing, targeting parents to encourage them to modify their own, and their children's, diets, encouraging alternatives to prolonged exposure to television on the part of both parents and children, making healthier foods cheaper, promoting exercise and healthy lifestyles, and so forth.

The limits of evidence

Undoubtedly, these are all sensible policy proposals. Yet it should be acknowledged that the evidence for their likely effectiveness is variable, and requires further research. Most research has been basic rather than applied, devoted to establishing the claimed causal link between advertising and food choice, rather than to evaluating the effectiveness of specific intervention. Media literacy programmes, for example, have not been clearly shown to alter behavioural choices, and the evidence that reducing exposure to advertising has beneficial consequences is also mixed. Worryingly, the temptation to seek simple solutions – such as scapegoating television or computer games as the major culprits, instead of acknowledging that multiple factors are at work - distracts attention from the breadth of strategies required for sustained and targeted interventions, as well as from the diversity of research required to guide their implementation. So, we do not, at present, have a clear consensus regarding the range of influences on children's food choice, though these are often taken to include gender, food costs, birth order, cultural meanings of food, obesity levels, family eating habits, parental regulation of media, parental mediation of advertising, peer norms, pro-health messages and pester power. Nor, more importantly, is there evidence that weighs these factors against each other so as to determine their relative influence.

It is, therefore, problematic to claim too much for the evidence base, for it renders those in favour of intervention vulnerable to the always-ready charge of overstating their case (as illustrated by Paliwoda & Crawford, 2003), a common enough charge in the often fraught field of media effects (consider, for example, the parallel debate over the harmful effects of televised violence, Millwood Hargrave & Livingstone, 2006). In my reviews of the literature for Ofcom (Livingstone, 2004; Livingstone & Helsper, 2004), I argued that the balance of evidence does support the conclusion that television advertising has a modest direct effect on children's food choices. I concluded that there is insufficient evidence to show that television advertising, indeed food promotion more generally, has the larger, indirect effects (through the interaction between promotion and other factors affecting children's lives) that many in the fields of child psychology and consumer research believe occur.

The conclusion in favour of modest direct effects rests on two premises. First, that there will never be the ideal experiment to resolve all doubt and so determine, once and for all, that television advertising adversely affects children's food choice. Second, that policy

must therefore err on the side of caution, based on a balance of probabilities as specified by the precautionary principle. In short, this domain is no different from many others in which policy rests on a judgement of probable influence rather than awaiting a scientific 'answer' regarding the harmful effects of food promotion, as the Chief Medical Officer has pointed out. In proceeding on this basis, it is important to understand clearly just what the empirical research does and does not show.

The evidence

The growing concern regarding the link between marketing/advertising and adverse health consequences is resulting in a growing number of population surveys concerned with obesity that include a measure of television viewing. A thirty-four-nation study of ten to sixteen year olds in 2001-2 found that, in twenty two of the thirty four countries (including the UK, where obesity figures are relatively high), there is a significant positive relationship between Body Mass Index (BMI) and amount of viewing (Janssen et al., 2005). Indeed, many large-scale, well-conducted national surveys, mainly but not only in the USA, also find a modest but consistent association between hours spent watching television and the likelihood of being overweight among children and teens.

Although experimental designs permit stronger causal claims to be made about the effects of advertising, the research effort has shifted from experimental to national survey methods, taking the causal hypothesis to have been established and so turning to investigate the range of factors, including but not restricted to advertising, that together influence children's diet and health. Large scale studies are needed here because many of these factors – including television advertising – each exert a fairly small influence. Further, longitudinal research – of which there is a growing amount - tracks year-on-year changes, showing the cumulative effects of advertising over years or decades. For example, a cohort study of over 10,000 nine to fourteen year olds in the USA found that those who spent more time with television/videos/games showed larger BMI increases a year later. These effects were stronger for those who are already overweight, suggesting a cumulative effect over time (Berkey, Rockett, Gillman and Colditz, 2003). The British Birth Cohort study, similarly, followed up over 11,000 children from the ages of five to thirty, revealing that the amount of weekend television viewing in early childhood continues to influence BMI in adulthood (Viner & Cole, 2005).

The survey evidence, showing small but consistent effects of exposure to television, is mirrored by the experimental evidence. This too suggests that television advertising has a modest, direct effect on children's food choices, such that those who are exposed to particular messages are influenced in their food preferences and choices (as exhibited in the experimental situation), compared with those who did not see those messages. Some experimental research continues to be conducted. In the UK, Halford and colleagues (2004) recently showed forty two children aged nine to eleven advertisements for either food or non-food items. Afterwards, the children ate significantly more after exposure to the food advertisements, and the obese and overweight children in the sample were particularly likely to remember the food advertisements. In another UK experiment, Auty and Lewis (2004) showed 105 children (aged six to seven and eleven to twelve) a scene

from the film, *Home Alone*, in which Pepsi Cola was spilled, while a control group saw the same clip with no branded product. The experimental group were significantly more likely to select Pepsi rather than Coke afterwards, compared with the control group.

Earlier research, conducted mainly in the USA, shows similar kinds of findings, albeit not consistently. Not all experiments are conducted in the artificial surroundings of a laboratory either. For example, in a much cited naturalistic experiment conducted over two weeks with five to eight year olds at a summer camp in Quebec, Gorn and Goldberg (1982) found that showing adverts for fruit resulted in children drinking more orange juice, while adverts for sweets resulted in them drinking less orange juice. In another experiment, Greenberg and Brand (1993) compared the responses of fifteen to sixteen year olds in matched schools, one which received Channel One, one with did not. They found that viewers of Channel One evaluated products advertised on the channel more favourably than did non-viewers and that they named more of the advertised brands as products they intended to buy, although actual purchases did not differ between viewers and non-viewers. Experiments can also be used to evaluate interventions, though this is less common. Robinson (1999) provided a range of school-based interventions to third and fourth grade children (approximately seven to eight years old) to reduce their television viewing and videogame playing over a six month period. Compared with the control group, the experimental group not only reduced their television viewing but also showed reduced BMI and adiposity (measure of body fat). Curiously, there was no reduction in high-fat foods, snacking or highly advertised foods in the diet of the experimental group.

What the evidence can show

The differences between surveys and experiments are important. Although this is not the place for a detailed account of epistemological or methodological issues in empirical research, some points are worth noting. Based on the studies reviewed by the most recent and most comprehensive report available, that of the Institute of Medicine (2005), I have broadly summarised the relation between research design and findings in the Table below.

	Links from marketing/ advertising to ...		
	food beliefs/ choices	food behaviour/diet	health/obesity
Date of research?	Mostly 1980s	1990s+	Mostly 2000+
Typical design	Mostly experiments	Mostly surveys	Mostly surveys

Age group	Mostly children (2-11)	Older children (6-11)	Older children/teens
Effect of what?	TV advertisements	TV viewing	TV viewing
Good measures?	Mainly moderate	Variable	Mainly low
Causal inference?	Mainly moderate	Mainly low	Mainly low
Generalisability?	Mainly moderate	Mainly high	Mainly high

The strengths and limits of the evidence base should now be readily apparent. First, experiments tend to link advertising to the precursors of diet and health, namely food-related beliefs and preferences, rather than to behaviour directly. The link from food preferences to health remains an inference, therefore, though not an unreasonable one. Further, few experiments have been conducted on teenagers, leaving most causal claims focused on the effects of advertising on children. Although more public concern is concentrated on children, obesity affects all ages, and there is little reason to suppose that teenagers (and, indeed, adults) are unaffected by advertising. Indeed, as I have argued elsewhere, it seems likely that different age groups are differently but still successfully targeted by advertising, with promotional strategies tailored to specific interests and age groups (Livingstone and Helsper, 2004).

The limitation of surveys, although often rigorously conducted on a substantial scale, is also evident from the table. Among the many influences on obesity, television viewing is consistently reported as making an independent contribution (ie. controlling for other factors) to children's and teenagers' weight/obesity in range of countries. However, the measure used for television exposure - generally a simple estimate of hours per week - is a poor proxy for exposure to advertising in particular. Thus survey evidence does not distinguish among three possible explanations for the observed association between television exposure and diet/health/obesity: (1) television viewing results in exposure to advertisements for food high in fat, salt or sugar; (2) television viewing is associated with frequent snacking, pre-prepared meals and/or fast food consumption; and (3) television viewing is a sedentary activity that reduces metabolic rates and displaces physical exercise. There is some support for each of these explanations, although little empirical research attempts to disentangle them, and many researchers believe all three to be operating.

Last, for those concerned with the validity and generalisability of research studies, the Table shows that most studies have faced a clear trade-off between using a research design that supports causal inferences (with random allocation of participants to experiment or control groups, in which media exposure is followed by measurement of the outcome variable) and a research design that is 'ecologically valid' (conducted under

conditions that resemble everyday life and so permit generalisation to the population). Put simply, with purely correlational evidence, the direction of causality and the problem of third causes, is difficult to resolve. With purely experimental evidence, the claim that findings can be generalised to the everyday lives of children is difficult to sustain. On the other hand, to put the same point positively, with a correlational study, one can demonstrate the existence of an association between exposure and behaviour under naturalistic conditions. With an experiment one can demonstrate the existence of a causal effect of exposure on behaviour under controlled conditions. Hence, researchers tend to use both types of design, 'triangulating' the findings from each in drawing overall conclusions.

Conclusions

So, where does this leave policy? Although policy decisions must here, as always, be made in the absence of the 'perfect' test, use of the precautionary principle does support the restriction of food advertising to children. Research provides little guidance regarding the influence of forms of promotion other than television advertising (whether using old or new media platforms), for this has rarely been examined, notwithstanding the fast-changing array of promotional strategies, particularly for the internet, games, mobile phone and so on. Nor does research on television advertising offer straightforward guidance regarding the degree of restriction, partly because there is no easy translation from amount of advertising viewed to dietary consequences, and partly because little research has evaluated the relative importance of food advertising by comparison with other influences on diet. However, there are some indications to guide regulators and other stakeholders in determining how much emphasis to place on food advertising, as part of a multi-stranded policy framework.

Generally, the measured size of the effect (a statistical term referring to a standardized index of magnitude) in empirical research is small to medium. This is the case for both experiments (generally, on television advertising) and for surveys (generally, on overall television exposure). However, many researchers are concerned to stress that 'small' effects in statistical terms add up to a large number of children in absolute terms, with the cumulative effects over the period of a child's development being much more sizeable, as some longitudinal research is beginning to show. For example, Storey et al estimated that, for every additional hour of daily television viewing, BMI could increase by 0.2. Put another way, for every additional hour of daily television viewing, Dietz and Gortmaker (1985) estimated the prevalence of teenage obesity could increase by 2 per cent. This is not such a small figure considering that, in the USA, this would mean an estimated additional 1.5 million young people falling into the 'obese' category (c.f. the Institute of Medicine report).

Given the complex array of factors contributing to the rise in childhood obesity, a different approach is recommended. If research and policy continues to ask simply, '*does food promotion affect children's food preferences, knowledge and behaviour?*', I suggest that the debate will continue to be polarised, with calls for new and better research followed by continued but irresolvable methodological disputes. In other words, very little policy will actually happen.

Alternatively, one can ask, *what factors affect children's food preferences, knowledge and behaviour?* This requires a refocusing on a probabilistic assessment of the range of risks to children's health and should take us into a broader and potentially more productive discussion of the different factors involved in children's food choice, as part of a risk-based approach to assessing potential media harms (Kline, 2003; Millwood Hargrave & Livingstone, 2006). In relation to the question of whether television advertising contributes to the problem of childhood obesity, a risk-based approach would recognise, and weigh, the role of television advertising, placing it in a multi-factor context. And, as I have argued, this approach would support taking policy action on television advertising aimed specifically at children as one among a number of important ways forward.

Note

This article draws on literature reviews originally commissioned from the author by Ofcom (see bibliography); these provide many more details of the available research evidence.

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Endnotes